

Project Report

On

**STATISTICAL ANALYSIS ON THE EFFECTS  
OF COVID-19 ON ONLINE SHOPPING**

*Submitted*

*in partial fulfilment of the requirements for the degree of*

**BACHELOR OF SCIENCE**

*in*

**MATHEMATICS**

*by*

**SAFNA**

(Register No. AB20AMAT031)

*Under the Supervision of*

**DR. SUSAN MATHEW PANAKKAL**



**DEPARTMENT OF MATHEMATICS**

**ST. TERESA'S COLLEGE (AUTONOMOUS)**

**ERNAKULAM, KOCHI - 682011**

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ST. TERESA'S COLLEGE (AUTONOMOUS), ERNAKULAM



**CERTIFICATE**

This is to certify that the dissertation entitled, **STATISTICAL ANALYSIS ON THE EFFECTS OF COVID-19 ON ONLINE SHOPPING** is a bonafide record of the work done by Ms. **SAFNA** under my guidance as partial fulfillment of the award of the degree of **Bachelor of Science in Mathematics** at St. Teresa's College (Autonomous), Ernakulam affiliated to Mahatma Gandhi University, Kottayam. No part of this work has been submitted for any other degree elsewhere.

Date:23/02/2023

Place: Ernakulam

**Dr. Susan Mathew Panakkal**  
Assistant Professor,  
Department of Mathematics,  
St. Teresa's College(Autonomous),  
Ernakulam.

**Dr. Ursala Paul**  
Assistant Professor and Head ,  
Department of Mathematics,  
St. Teresa's College(Autonomous),  
Ernakulam.

**External Examiners**

1:.....

2: .....

# DECLARATION

I hereby declare that the work presented in this project is based on the original work done by me under the guidance of Dr. Susan Mathew Panakkal, Assistant Professor, Department of Mathematics, St. Teresa's College (Autonomous), Ernakulam and has not been included in any other project submitted previously for the award of any degree.

Ernakulam.

**SAFNA**

Date: 23/02/2023

**AB20AMAT031**

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Ernakulam.

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**SAFNA**

**AB20AMAT031**

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# Chapter 1

## INTRODUCTION

### ABSTRACT

Indian consumers are very particular about their products. The consumer choices vary based upon their preference towards online shopping verses offline shopping. The internet and traditional shopping both have their own advantages and disadvantages.

### STATISTICS

Statistics is the study, collection, inspection, analysis and classification of data. Massive amounts of numerical data are gathered and analyzed with the help of statistics. Using data samples from experiments or surveys to make inferences is another aspect of statistics. The area of applied mathematics known as statistics develops quantitative data gathering, description, analysis, and conclusion inference. In statistics, we learn about the characteristics of objects or events in a population by examining a smaller number of similar objects or events (a sample). This is useful because gathering data or information of an entire population is expensive and challenging. Statistics are a part of practically every division of a business and are crucial to investing.

### VARIABLES

A value which can be altered is called a variable. For example weight of students in a class.

Variables are of two types:

1) Qualitative variables:

Variables whose value can be counted or measured. For example

height, weight, age etc.

## 2) Quantitative variables:

Variables whose value cannot be counted or measured. For example eye colour, gender, sexuality etc.

## STATISTICS – DESCRIPTIVE AND INFERENCE

The study of statistics uses arithmetic and is concerned with the gathering, analysis, interpretation, and presenting of data. Inferential statistics and descriptive statistics are the two main categories.

Descriptive statistics provides a summary of the characteristics of data. Using inferential statistics, it is possible to determine whether the data accepts or rejects a hypothesis.

### DESCRIPTIVE STATISTICS

The fundamental characteristics of a dataset found in a particular study are described, illustrated, and summarised using descriptive statistics. It makes it easier for analysts to comprehend the data. It does not contain hypotheses, judgements, probabilities, or conclusions.

### INFERENCE STATISTICS

Inferential statistics is a method which helps us to gain a proper understanding of the data by analysing the samples that taken from it. It generalizes the population by using different statistical tests and tools. The hypothesis testing is one of the test that make assumption and draw conclusions about the population from the sample.

The term ‘null hypothesis ( $H_0$ )’ denotes that there is no relationship between the population variables. Then the alternate hypothesis ( $H_1$ ) denotes the statement between variables which is expected to be true. The p-value which is calculated from a test describes the probability of the occurrence of a given event if the null hypothesis were true, the numerical value of p-value is between 0 and 1. If the p-value is less than the significance level, that is stronger the evidence reject the null hypothesis

### STATISTICAL SURVEY

A statistical survey is an inquiry of the traits of a particular group using data gathered from a sample of that community and traits es-



estimated using a methodical statistical approach. These steps must be taken sequentially while conducting a statistical survey. We might not be able to get decent survey results unless we adhere to these methods methodically.

## ABOUT COVID-19

A contagious sickness that affects the human respiratory system is the corona virus, sometimes referred to as COVID-19. Corona virus has an impact on how we live our daily lives. Millions of individuals have been impacted by this pandemic, who are either ill or dying as a result of the disease's spread.

Contact with an infected person is the main way it spreads. The majority of nations have reduced the pace at which they are producing goods. The coronavirus was initially discovered in China's Wuhan city in December 2019. The outbreak of the disease was proclaimed a pandemic by the World Health Organization (WHO) in March 2020.

To combat the spread of the disease in India, the Indian government, led by Prime Minister Narendra Modi, declared a 21-day nationwide lockdown on March 23, 2020. This restriction on movement affected all 1.3 billion people in India. Because of this, nearly every business and every educational institution in India had to close.

## 1.1 OBJECTIVES

1) Descriptive study on the percent of persons preferring different factors are found.

2) To check the existence of relation between age and amount spend for online shopping per month.

3) To check the existence relation between gender and amount spend for online shopping per month.

4) To check the existence of relation between age groups and category of products.

5) To check the existence of relation between monthly income and amount spend for online shopping per month.

6) To check whether there is a statistically significant mean difference

between male and female on their increase in tendency to shop while shopping online.

7) To check whether there is a statistically significant mean difference between male and female on their increase in tendency to shop while online shopping.

8) To check whether there is a statistically significant mean difference between male and female on whether they purchase more on seasonal sales.

## 1.2 LITERATURE REVIEW

Indian customers have high standards for the goods they purchase. Customers' preferences for online versus offline purchasing influence the choices they make. Shopping on the internet and in stores each have benefits and drawbacks. Long distance travel is not necessary, online shopping has a greater selection, is available around-the-clock, gives significant discounts, and expands the ability for user feedback. On the other side, shoppers may personally inspect things when buying traditionally, which is not possible when shopping online. According to their choices at a given time, consumers may use both the traditional and the online modes of shopping, which results in fundamentally different behaviours across the two modes.(Sarkar, Raja and Sabyasachi Das, 2017).(1)

Through the extensive selection of online retailers, for example, the internet offers a variety of ways to save time. Because there are fewer large crowds and lengthy wait periods, online retailers appear to be more convenient (Jiang, Yang and Jun, 2013).(2)

Additionally, the ease with which product information may be accessed online is referred to as "online search convenience" and is seen as one of the most important factors in choosing between online and offline purchasing (Verhoef, Neslin, and Vroomen, 2007; Omotayo and Omtope,(3) 2018). Due to the great convenience level it offers, consumers strongly choose online channels. Without engaging in a lot of physical activity, online sources offer useful information about current discounts,

deals, and personalised recommendations (Dekimpe, Geyskens and Gielens, 2019).(4)

Customers can purchase goods and services from anywhere at any time, thereby overcoming time and location restrictions.(Adnan, H. 2014)(5)

Online shopping has the benefit of giving customers comprehensive information and a variety of options, allowing them to compare products and prices online. Finding your desired goods or service online is made easier by the availability of additional options and ease.(Patrick Butler, Joe Peppard,1998)(6)

According to this study's empirical results, consumer attitudes regarding internet buying are influenced by perceived benefits and levels of trust. Perceived web quality influences eWOM, which in turn influences trust, and eWOM influences perceived web quality. According to the findings, trust and perceived benefits are important indicators of customer attitudes towards internet purchasing. Furthermore, the authors discovered that greater perceived web quality increases trust in an online store's website. Trust was discovered to be directly correlated with perceived online quality, and the former has a favourable and considerable influence on perceived benefits. The authors also discovered that trust and perceived benefits were responsible for 28 % of the variation in views about internet buying.(Al-Debei, Mutaz M., Mamoun N. Akroush, and Mohamed Ibrahim Ashouri.2015)(7)

### 1.3 SIGNIFICANCE OF STUDY

The outbreak of Covid-19 brought a rapid increase in online shopping than the offline shopping. Most of the people start to shop online because of some drawbacks ( time consuming, high price, less choices) of offline shopping. The aim of this study is to find the preferences of customers about online and offline shopping and also to find out the different factors that influence the customers to shop online.This study also helps to find if there is any relation between different factors among different age groups, gender etc.

## 1.4 LIMITATIONS OF STUDY

Despite the study's significant findings, few limitations were present in our survey. The margin of error is inversely proportional to the sample size ie, the margin of error decreases as the sample size increases. However the survey could only include 336 respondents due to time constraints and other factors. The survey did not consider the age group under the age 13. The number of male respondents was less compared to the number of female respondents. There is a chance that the difference in the male- female proportion might affect the outcomes of the survey. The study only made use of qualitative data. There is a possibility that the statistical data may or may not be biased since the responses were the respondents' personal preferences.

## Chapter 2

# METHODOLOGY

### 2.1 METHODS

The target population of the survey was the population of the students from age 13-17, 18-30 and 30 above. The questionnaire consists of 19 questions including age, gender, occupation, monthly income, etc. The data was collected by circulating Google forms among these age groups. The questionnaire included the questions.

### 2.2 CHI SQUARE TEST

The Chi-square test is a practical way to compare experimental data with what is theoretically predicted based on a particular hypothesis. In other words chi-square test is the method for analyzing relationship between two variables. Null Hypothesis (H<sub>0</sub>) is the assumption that there is no relationship between two variables. If a null hypothesis is not rejected, it has no impact on the study's findings. Alternate Hypothesis (H<sub>1</sub>) shows that there exists a relationship between the variables. Alternate hypothesis is accepted only after the null hypothesis is rejected. The significance level alpha is the probability of making the incorrect decision when the null hypothesis is true.

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where

C = Degrees of freedom

O = Observed Value

E = Expected Value

## 2.3 INDEPENDENT SAMPLE T TEST

A t-test is a statistical test that is used to compare the means of different data sets to identify the difference between them. The most frequently applied type of the t-test is the independent samples t-test, which is also referred to as the two-samples t-test or the unpaired samples t-test. The variables that we use in this test are:

- Dependent variables
- Independent variables

The Independent Samples t Test has two different but equal ways to represent the null hypothesis ( $H_0$ ) and alternative hypothesis ( $H_1$ ):

$H_0: \mu_1 = \mu_2$  (“the two population means are equal”)

$H_1: \mu_1 \neq \mu_2$  (“the two population means are not equal”)

OR

$H_0: \mu_1 - \mu_2 = 0$  (“the difference between the two population means is equal to 0”)

$H_1: \mu_1 - \mu_2 \neq 0$  (“the difference between the two population means is not 0”)

$\mu_1$  -population means for group 1

$\mu_2$  -population mean for group 2

The test statistic t is calculated as follows when it is assumed that the two independent samples are derived from populations with unequal variances (i.e.,  $\sigma_1^2$  and  $\sigma_2^2$ ).

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \quad (2.1)$$

Where

$\bar{x}_1$  = Mean of first sample

$\bar{x}_2$  = Mean of second sample

$n_1$  = Number of observations (sample size) of first sample  $n_2$  = Number of observations (sample size) of second sample

$S_1$  = Standard deviation of first sample

$S_2$  = Standard deviation of second sample

We assign an alpha ( $\alpha$ ) to denote the significance level to decide whether to accept or reject the alternative hypothesis. We usually take the value of alpha as 0.05.

The probability that your null hypothesis is true is indicated by this p-value. The alternative hypothesis is accepted and the null hypothesis is rejected if the p-value is less than the alpha level. If the p-value exceeds the chosen alpha level, the alternative hypothesis is rejected and the null hypothesis is accepted. With the chosen confidence level and degrees of freedom, the estimated t value is then compared with the calculated t value from the t distribution table.

$$df = \frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{(s_1^2/n_1)^2}{n_1 - 1} + \frac{(s_2^2/n_2)^2}{n_2 - 1}}$$

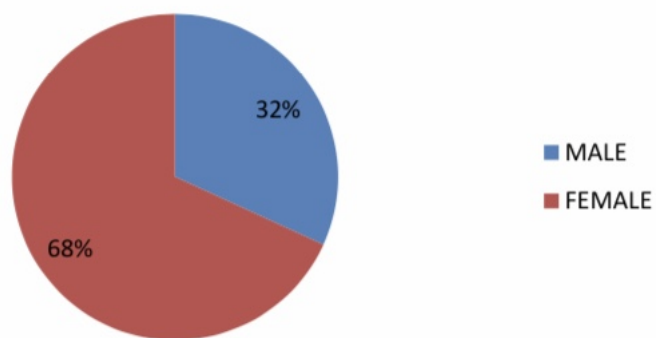
The null hypothesis is rejected if the estimated t value is greater than the calculated t value.

## Chapter 3

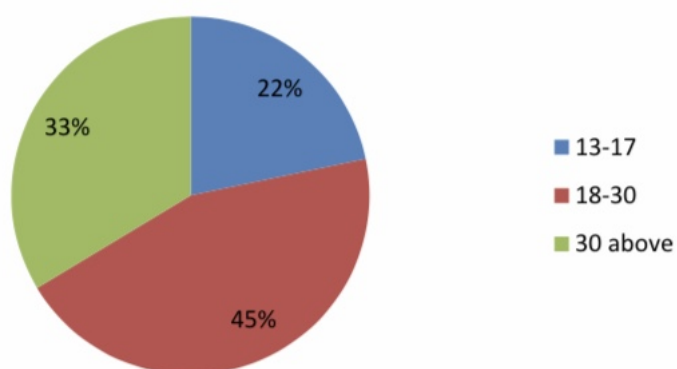
# PRESENTATION OF DATA

### 3.1 EXPLORATORY DATA ANALYSIS

#### GENDER

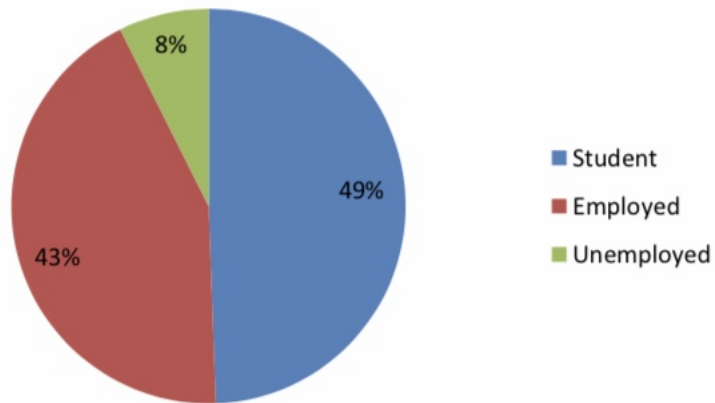


#### AGE GROUP

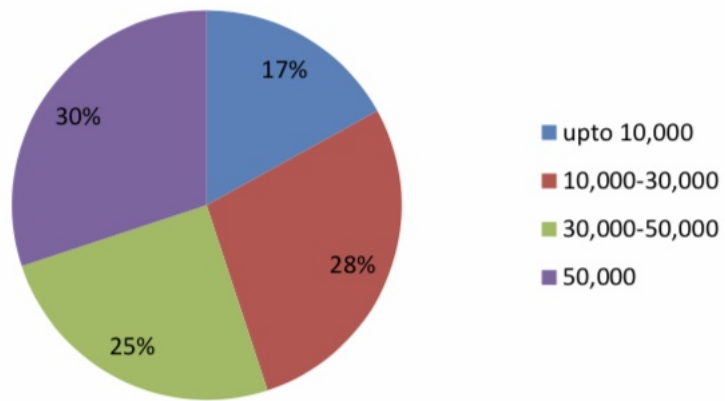




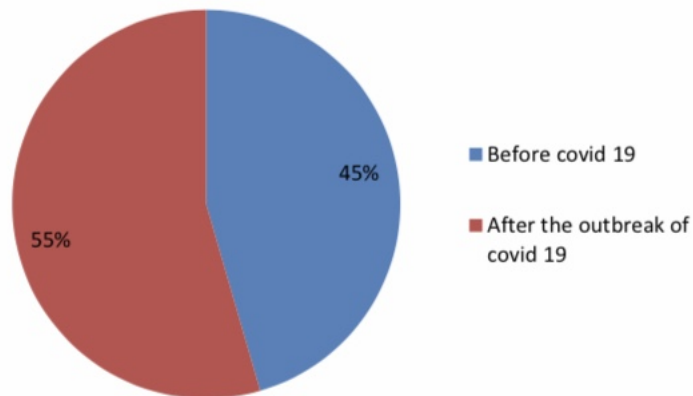
## Occupation



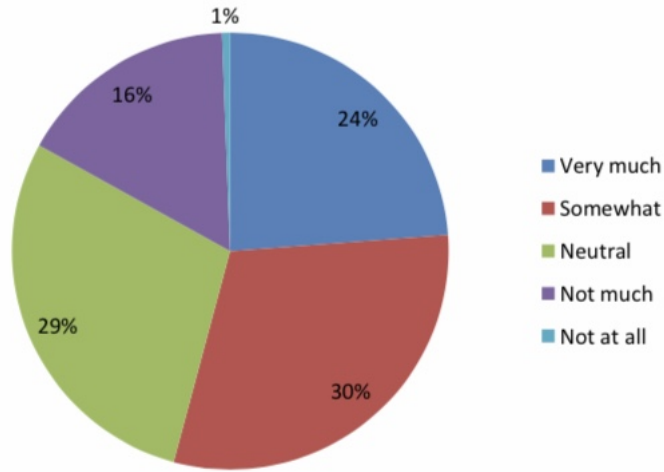
## Montly income of the family



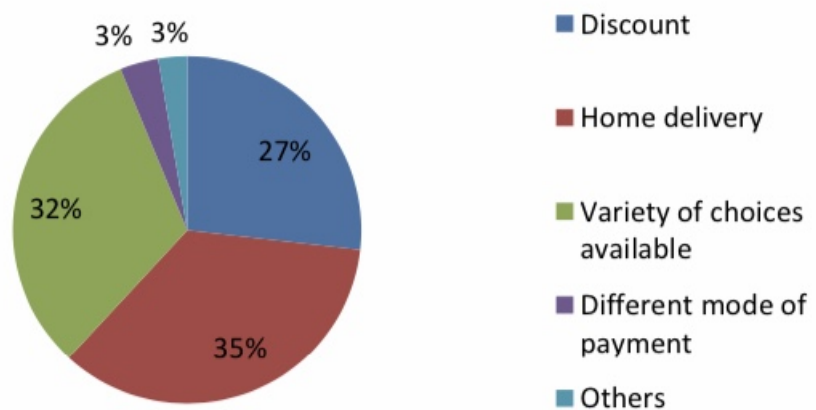
## When did u start to shop online?



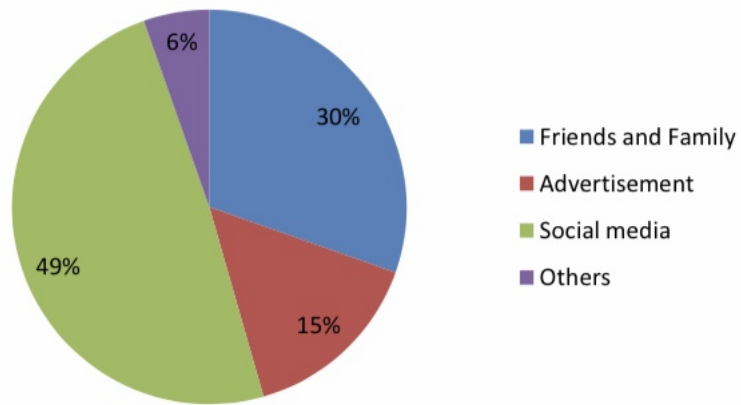
### How much do you shop online?



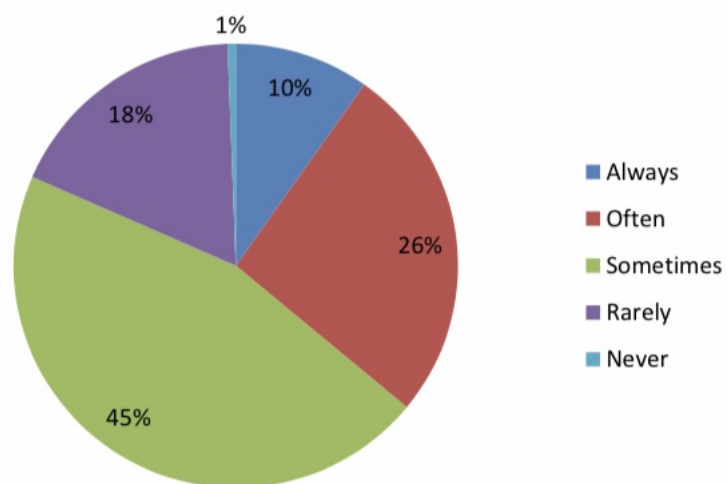
### What are the factors that attract you the most about online shopping?



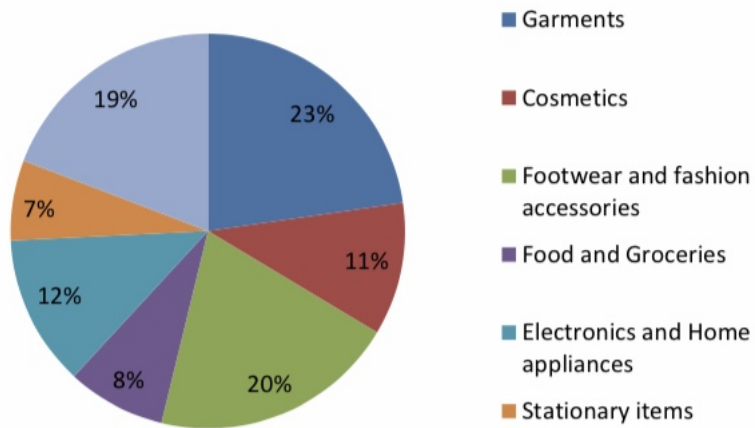
## How do you come to know about online shopping?



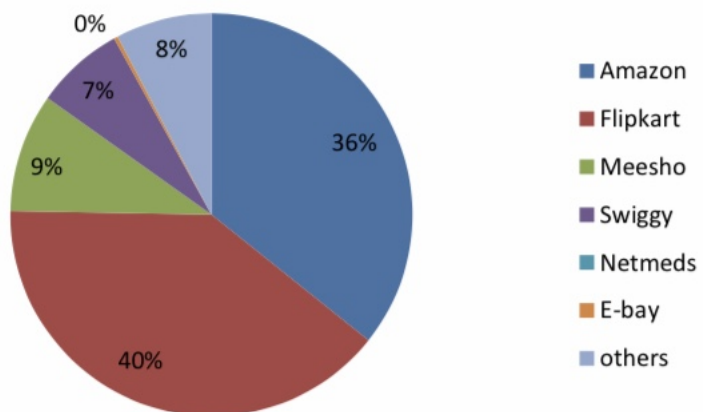
## How often do you shop online?



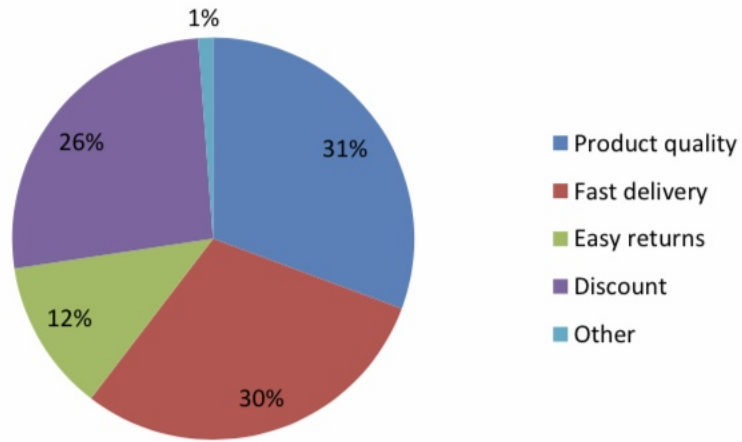
### What categories of the product you purchase most?



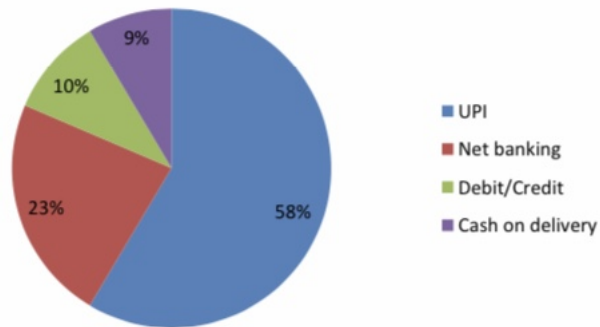
### What are the online apps that you prefer for online shopping?



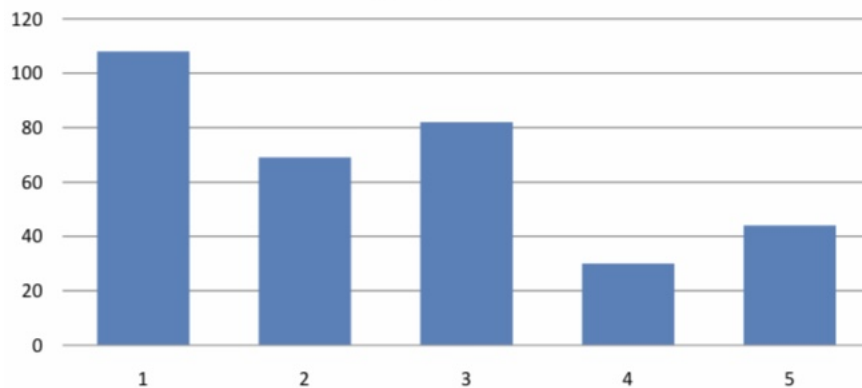
### What factor from the above chosen app attract you the most?



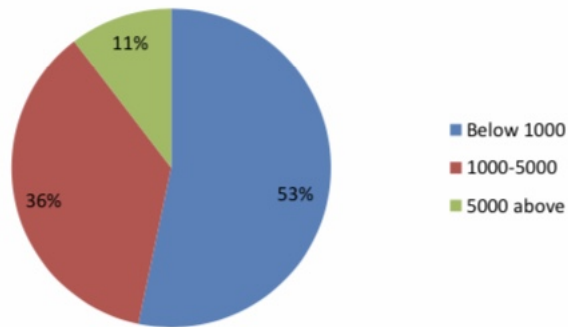
### Which payment method do you prefer?



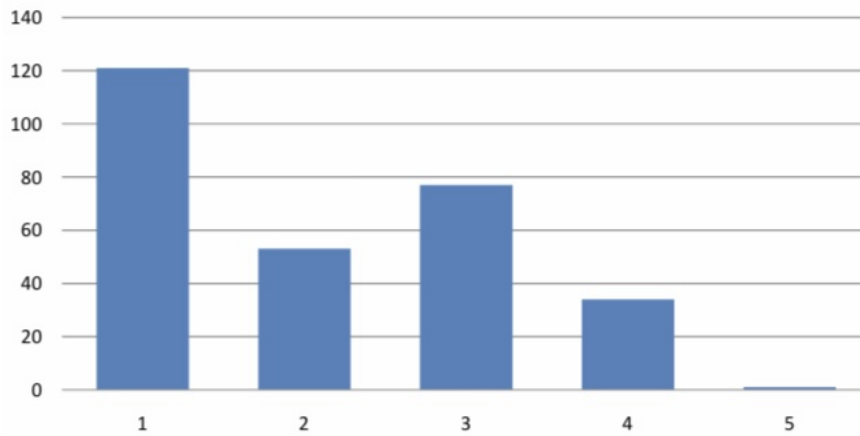
### Did your tendency to shop increase while shopping online?



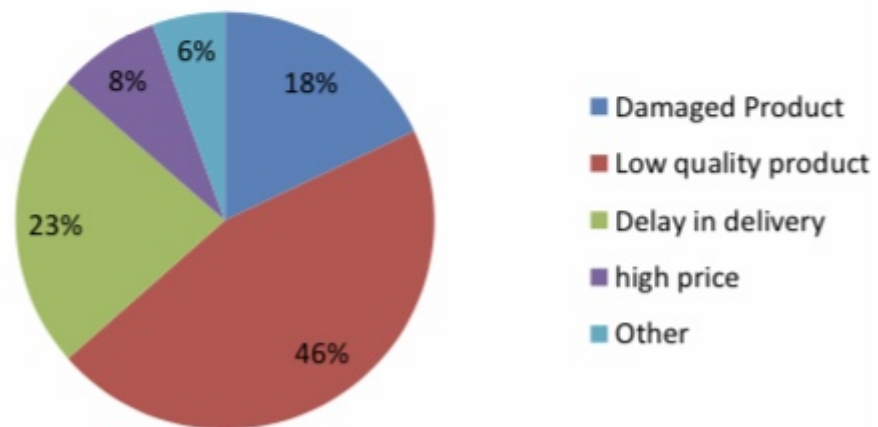
### How much do you spend online shopping per month?



### Do you purchase more during seasonal sale?



### What is the problem that you have faced the most while shopping online?



## 3.2 CHI-SQUARE ANALYSIS

### 3.2.1 AGE AND AMOUNT SPEND

Qn) How much do you spend for online shopping per month?

- a. Below 1000
- b. 1000-5000
- c. 5000 above

Observed Frequency:

Age	Below 1000	1000-5000	5000 above	Grand Total
13-17	44	15	14	73
18-30	88	49	30	85
30 above	47	58	8	113
Grand Total	179	122	35	336

TABLE 3.2.1 A

$H_0$ : There is no relation between age and amount spend.

$H_1$ : There is a relation between age and amount spend. Critical

Value: 0.05

Expected Frequency:

Age	Below 1000	1000-5000	5000 above	Grand Total	Chi-square value
13-17	38.889881	26.50595238	7.60416667	73	0.0000808081
18-30	79.9107143	54.46428571	15.625	150	
30 above	60.1994048	41.0297619	11.7708333	113	
Grand Total	179	122	35	336	

TABLE 3.2.1 B

Expected frequency = (row total + column total)/grand total

p value =  $8.08081 \times 10^{-5}$

Since p value is lesser than 0.05 we will reject the null hypothesis.

Hence, we can conclude that there exists a relation between age and amount spend.

### 3.2.2 GENDER AND AMOUNT SPEND

Qn) How much do you spend for online shopping per month?

a. Below 1000

b. 1000-5000

c. Above 5000

Observed Frequency :

GENDER	Below 1000	1000-5000	5000 above	Grand Total
Female	143	78	8	229
Male	36	44	27	107
Grand Total	179	122	35	336

TABLE 3.2.2 A

$H_0$ : There is no relation between gender and amount spend.

$H_1$ : There is a relation between gender and amount spend.

Critical Value: 0.05

Expected Frequency:

Gender	Below 1000	1000-5000	5000 above	Grand Total	Chi-square value
Female	121.997024	83.14880952	23.8541667	229	$1.35489 \times 10^{-10}$
Male	57.0029762	38.85119048	11.1458333	107	
Grand total	179	122	35	336	



**TABLE 3.2.2 B**

Expected frequency = (row total + column total)/grand total

p value =  $1.35489 \times 10^{-10}$

Since p value is lesser than 0.05 we will reject the null hypothesis. Hence, we can conclude that there exists a relation between gender and amount spend.

### **3.2.3 AGE GROUP AND CATEGORY OF PRODUCTS**

**Qn) What category of the product you purchase most?**

- a. Garments
- b. Cosmetics
- c. Footwear and fashion accessories
- d. Food and groceries
- e. Electronics and home appliances
- f. Stationary items
- g. Other

**Observed Frequency :**

Products	13-17	18-30	30 above	Grand Total
Cosmetics	9	21	13	43
Electronics and home appliances	6	13	30	49
Food and groceries	5	15	12	32
Footwear	30	39	11	80
Garments	12	43	35	90
Stationary items	6	13	7	26
Others	5	6	5	16
Grand total	73	150	113	336

TABLE 3.2.3 A

$H_0$ : There is no relation between age and category of products.

$H_1$ : There is a relation between age and category of products.

Critical Value: 0.05

Expected Frequency:

Products	13-17	18-30	30 above	Grand total	Chi-square value
Cosmetics	9.342261905	19.19642857	14.46130952	43	$3.44263 \times 10^{-5}$
Electronics and home appliances	10.64583333	21.875	16.47916667	49	
Food and groceries	6.952380952	14.28571429	10.76190476	32	
Footwear and fashion accessories	17.38095238	35.71428571	26.9047619	80	
Garments	19.55357143	40.17857143	30.26785714	90	
Stationary items	5.648809524	11.60714286	8.744047619	26	
Others	3.476190476	7.142857143	5.380952381	16	
Grand total	73	150	113	336	

TABLE 3.2.3 B

Expected frequency = (row total + column total)/grand total

p value =  $3.44263 \times 10^{-5}$

Since p value is lesser than 0.05 we will reject the null hypothesis. Hence, we can conclude that there exists a relation between age and category of products.

### 3.2.4 MONTHLY INCOME AND AMOUNT SPEND

Qn) How much do you spend for online shopping per month?

- a. Below 1000
- b. 1000-5000

c. Above 5000

Observed Frequency :

Monthly Income	Below 1000	1000-5000	5000 above	Grand Total
Upto 10,000	41	11	5	57
10,000-30,000	55	33	6	94
30,000-50,000	39	35	10	84
50,000	44	43	14	101
Grand total	179	122	35	336

TABLE 3.2.4 A

$H_0$ : There is no relation between income and amount spend.

$H_1$ : There is a relation between income and amount spend.

Critical Value: 0.05

Expected Frequency:

Monthly In- come	Below 1000	1000-5000	5000 above	Grand To- tal	Chi-square value
Up to 10,000	30.366071	20.69642857	5.9375	94	0.013672
10,000-50,000	50.077381	34.13095238	9.7916667	84	
30,000-50,000	44.75	30.5	8.75	101	
50,000 above	53.806548	36.67261905	10.520833	57	
Grand Total	179	122	35	336	

TABLE 3.2.4 B

Expected frequency = (row total + column total)/grand total

P value = 0.013672

Since p value is lesser than 0.05 we will reject the null hypothesis. Hence, we can conclude that there exists a relation between age and category of products.

### 3.3 INDEPENDENT T TEST

#### 3.3.1 INDEPENDENT SAMPLE T-TEST FOR FEMALE AND MALE ON HOW MUCH DO THEY LIKE TO SHOP ONLINE

Qn) How much do you like to shop online?

- a. Very much
- b. Somewhat
- c. Neutral
- d. Not much
- e. Not at all

The options are converted into numerical values of scale 1 to 5. The score of people from each gender selecting the options are collected . We can use an independent t test to understand whether there is a significant mean difference between the male and female on how much do they like to shop online. The table 3.3.1 A and table 3.3.1 B shows the group statistics and independent t-test of 2 samples assuming unequal variables.

Here we take two groups:

FEMALE and MALE

To check whether there is any statistical significance in their mean difference.

Gender	N	Mean	Std.Deviation	Variance
Female	229	3.524017	1.041081168785604	1.08385
MALE	107	3.775701	1.021545397914356	1.043555

**TABLE 3.3.1 A**

<b>t-Test: Two-Sample Assuming Unequal Variances</b>					
<b>Gender</b>	<b>t stat</b>	<b>p-value(two tailed)</b>	<b>t critical</b>	<b>Hypothesized mean difference</b>	<b>Df</b>
<b>Female and Male</b>	<b>-2.09114</b>	<b>1.971271</b>	<b>0.037712</b>	<b>0</b>	<b>221</b>

**TABLE 3.3.1 B**

**Hypothesis under study**

**Null hypothesis:  $H_0$  : There is no significant mean difference between male and female on how much do they like to shop online.**

**Alternate hypothesis:  $H_1$  : There is significant mean difference between male and female on how much do they like to shop online.**

**DECISION CRITERIA**

**If p value is less than 0.05, we reject null hypothesis at a 5 percent level of significance.**

**If p value is greater than 0.05, we accept null hypothesis at a 5 percent level of significance.**

**As can be seen in table3.5B p value is which is 0.037712 which is less than 0.05 (  $p < 0.05$  ) ,so we reject  $H_0$  and accept  $H_1$  .So it is clear that there is a statistically significant mean difference ie, there is a change in the pattern of male and female on how much do they like to shop online.**

**3.3.2 INDEPENDENT SAMPLE T TEST FOR FEMALE AND MALE ON THEIR INCREASE IN TENDENCY TO SHOP WHILE SHOPPING ONLINE.**

**Qn) Did the tendency to shop online increase while shopping online?**

**YES**

- 1**
- 2**
- 3**
- 4**

o 5

NO

The score of people from each gender selecting the options are collected. We can use an independent t test to understand whether there is a significant mean difference between male and female on their increase in tendency to shop while shopping online.

The table 3.3.2 A and table 3.3.2 B shows the group statistics and independent t test of 2 samples assuming unequal variances. Here we take 2 groups: Female and Male to check whether there is any statistical significance in their mean difference.

Gender	N	Mean	Std.Deviation	Variance
Female	229	2.585153	1.372648899026987	1.884165
MALE	107	2.383178	1.405144476557482	1.974431

TABLE 3.3.2 A

t-Test: Two-Sample Assuming Unequal Variances					
Gender	t stat	p-value(two tailed)	t critical	Hypothesized mean difference	Df
Female and Male	1.236522	0.217693	1.971719	0	203

TABLE 3.3.2 B

Hypothesis under study.

Null hypothesis :  $H_0$  : There is no significant mean difference between male and female on their increase in tendency to shop while shopping online.

Alternate hypothesis :  $H_1$  : there is significance mean difference between male and female on their increase in tendency to shop while shopping online.

Decision criteria: If p value is less than 0.05 , we reject null hypothesis at a 5 percent level of significance .

If p value is greater than 0.05 , we accept null hypothesis at a 5 percent level of significance.

As can be seen in table 3.6 B, p value is 0.217693 which is greater than 0.05 (p greater than 0.05) , so we accept  $H_0$  and reject  $H_1$  . So it is clear that there is no statistically significant mean difference ie, there is no change in the pattern of male and female in their increase in tendency to shop while shopping online.

### 3.3.3 INDEPENDENT SAMPLE T TEST FOR FEMALE AND MALE ON WHETHER THEY PURCHASE MORE DURING THE SEASONAL SALES.

Qn) Do you purchase more during the seasonal sales?

YES

1

2

3

4

5

NO

The score of people from each gender selecting the options are collected. We can use an independent t test to understand whether there is a significant mean difference between male and female on whether they purchase more during seasonal sales.

The table 3.3.3A and table 3.3.3B shows the group statistics and independent t-test of 2 samples assuming unequal variances, here we take 2 groups: Female and male To check whether there is any statistical significance in their mean difference’.

Gender	N	Mean	Std.Deviation	Variance
FEMALE	229	2.60087	1.471882128432844	2.166437
MALE	107	2.327103	1.372064138442515	1.88256

TABLE 3.3.3A



t-Test: Two-Sample Assuming Unequal Variances					
Gender	t stat	p-value(two tailed)	t critical	Hypothesized mean differ- ence	Df
Female and Male	1.781252	0.07245	1.970756	0	221

TABLE 3.3.3B

Hypothesis under study

Null hypothesis :  $H_0$  :There is no significant mean difference between male and female on whether they purchase more during seasonal sales.

Decision criteria:

if p-value is less than 0.05 , we reject null hypothesis at a 5 percent level of significance.

If p-value is greater than 0.05 ,we accept null hypothesis at a 5 percent level significance.

As can be seen in table 3.7B , p value is 0.07245 which is greater than 0.05 (p greater than 0.05).So, we accept  $H_0$  and reject  $H_1$ . So it is clear that there is no statistically significant mean difference ie, there is no change in the pattern of male and female in whether they purchase more during the seasonal sales.

#### DESCRIPTIVE DATA

Qn) What are the factors that attract you the most about online shopping?

- a. Discount
- b. Home delivery
- c. Variety of choices available
- d. Different mode of payment
- e. Others

The survey conducted among 336 people, the study shows that 118 people prefer home delivery as the factor that influence them to shop online.

Discount	90
Home delivery	118
Variety of choices available	107
Different mode of payment	12
Others	9

Qn) What are the online apps that you prefer for online shopping?

- a. Amazon
- b. Flipkart
- c. Meesho
- d. Swiggy
- e. E-bay
- f. others

Qn) What are the factors from the above chosen app attracts you the most?

- a. Product quality
- b. Fast delivery
- c. Easy return
- d. Discount
- e. other

The survey shows that 39.6% of respondents purchased from Flipkart and 35.7% respondents from Amazon. The factors that encourage customers to shop online are crucial in helping web retailers choose the right marketing methods. This will enable online retailers to provide better customer service.

Amazon	120
Flipkart	133
Meesho	32
Swiggy	24
E-bay	1
Others	26

Out of the 336 people who participated in the survey, 133 people chose flipkart as their most preferable online shopping app. Among these, 35 people chose product quality, 47 people chose fast delivery, 15 people chose easy returns, 35 people chose discount and 1 person chose others as the factor that attract them the most about flipkart.

## Chapter 4

# RESULTS AND CONCLUSION

### 4.1 RESULT

1. Descriptive study on the percent of persons preferring different factors are found as follows: a. 118 people prefer home delivery as the factor that influence them the most to shop online. b. Flipkart is the most preferred online shopping app and is chosen by 39.6133 people chose flipkart as their most preferable online shopping app. Among these 35 people chose product quality, 47 people chose fast delivery, 15 people chose easy returns, 35 people chose discount and 1 person chose others as the factor that attract them the most about flipkart.

2. Gender is related to the amount spend for online shopping per month.

3. Age is related to the category of products.

4. Monthly income is related to amount spend for online shopping per month.

5. A statistically significant mean difference exist between male and female ie, there is a change in the pattern of male and female on how much do they like to shop online.

6. A statistically significant mean difference does not exist between male and female ie, there is no change in the pattern of male and female on their increase in tendency to shop while shopping online.

7. A statistically significant mean difference does not exist between male and female ie, there is no change in the pattern of male and female

on whether they purchase more during seasonal sales.

## 4.2 CONCLUSION

From our questionnaire, we were able to find out that out of the 336 people who participated in the survey, majority of respondents chose flipkart as their most preferable online shopping app. fast delivery was chosen as the factor that influence the most to shop online.

From our analysis, we were able to find that there exists a relation between age and the amount spend for online shopping per month, age and category of products, monthly income and the amount spend for online shopping per month.

A statistically significant mean difference was found to exist between male and female on how much do they like to shop while shopping online and on their increase in tendency to shop while shopping online. But a statistically significant mean difference does not exist between male and female on whether they purchase more during seasonal sales.

## 4.3 REFERENCE

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#### 4.4 ANNEXURE

# ***Effects of online shopping on people after the out break of Covid 19***

Hey, we are 3rd year Bsc Mathematics students of St.Terasas college , Ernakulam. This questionnaire is part of our academic research to study 'Effects of online shopping on people after the outbreak of Covid 19' .Kindly spare a few minutes to fill this form .The data provided by you will be kept confidential. Thank you.

1.Name \*

Short answer text

2.E mail address \*

Short answer text

3. Gender \*

- Male
- Female
- Other: \_\_\_\_\_

4. Age group \*

- 13-17
- 18-30
- 30 above



5. Occupation \*

- Student
- Employed
- Unemployed



6. Monthly income of the family \*

- Upto 10,000
- 10,000-30,000
- 30,000-50,000
- 50,000 above

7. When did you start to shop online more? \*

- Before Covid 19
- After the outbreak of covid 19

8. How much do you like to shop online? \*

- Very much
- Somewhat
- Neutral
- Not much
- Not at all

9. What are the factors that attract you the most about online shopping? \*

- Discount
- Home delivery
- Variety of choices available
- Different mode of payment
- Others

10. How did you come to know about online shopping? \*

- Friends and family
- Advertisement
- Social media
- Others

11. How often do you shop online? \*

- Always
- Often
- Sometimes
- Rarely
- Never

12. What categories of the product you purchase most? \*

- Garments
- Cosmetics
- Footwear and fashion accessories
- Food and Groceries
- Electronics and home appliances s
- Stationary items
- Other: \_\_\_\_\_

13. What are the online apps that you prefer for online shopping? \*

- Amazon
- Flipkart
- Meesho
- Swiggy
- Netmeds
- E-bay
- Other: \_\_\_\_\_

14. What factor from the above chosen app attract you the most? \*

- Product quality
- Fast delivery
- Easy returns
- Discount
- Other: \_\_\_\_\_

15. Which payment method do you prefer? \*

- UPI
- Net banking
- Debit/Credit
- Cash On Delivery

16. Did your tendency to shop increase while shopping online? \*

Yes

- 1
- 2
- 3
- 4
- 5

No

17. How much do you spend for online shopping per month? \*

- Below 1000
- 1000-5000
- 5000 above

18. Do you purchase more during the seasonal sales? \*

Yes

- 1
- 2
- 3
- 4
- 5

No

19. What is the problem that you have faced the most while shopping online? \*

- Damaged product
- Low quality products
- Delay in delivery
- High price
- Other: \_\_\_\_\_