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A Study on Consumer Perception towards E-2 Wheelers

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Abstract

Electric 2 wheelers or E-2 wheelers are those vehicles that use electricity to operate. This paper aims to know the consumers perception towards the E-2 wheelers. Electric 2 wheelers are new way of transportation having no air, noise pollution and an environmental friendly way to commute. This paper also discuss about the factors that encourage customers to buy E-2 wheelers, opinion of customers on factors like speed, mileage, price, service cost and after sales service of E-2 wheelers when compared with conventional 2 wheelers and overall satisfaction derived from E-2 wheelers.

I. INTRODUCTION

India is a country with the third-largest road network in the world. Road travel seemed to be a preferred choice in India with over 60 % of the population used personal or shared vehicles to commute. Conventional vehicles are a major cause of global warming and environmental air pollution. All types of vehicles produce dust from brakes, tires, and road wear. The average diesel vehicle has worse effect on air quality than the average gasoline vehicle. But both gasoline and diesel vehicle pollutes more than the electric vehicle.

Electric motorcycles and scooters are plug-in electric vehicles with two wheels. The electricity is stored on board in a rechargeable battery, which drives one or more electric motors. Most electric motorcycles and scooters as of May 2019 are powered by rechargeable lithium ion batteries, though some early models used nickel-metal hydride batteries. Electric motorcycles and scooters suffer considerable disadvantage in range, since batteries cannot store as much energy as a tank of gasoline.

Electric and gasoline powered motorcycles and scooters of the same size and weight are roughly comparable in performance. Also it need only very little maintenance. Electric machines enjoy an enormous fuel cost advantage. Even with special equipment, charging a battery takes significantly longer than filling a gasoline

tank, which can make electric vehicles less flexible than their gasoline counterparts. Electric vehicles are far quieter than gasoline powered ones, so silent they may sneak up on unwary pedestrians.

China leads the world in electric scooter sales. In January 2013, the Indian government announced a plan to provide subsidies for hybrid and electric vehicles. But there is no significant change in market. In this paper, the consumer perception towards E-2 wheelers is going to be discussed.

Objectives

- To identify the determinants of consumer buying behavior towards E-2 wheeler.
- To examine the relationship between selected demographic variables and determinants of consumer buying behavior towards E-2 wheelers.
- To examine the relationship between the determinants of consumer buying behavior towards E-2 wheeler and overall consumer satisfaction on E-2 wheelers.

Review of Literature

(Tupe, Kishore, & Johnvieira, 2020): In this paper, 'Consumer perception of electric vehicles in India', shows the need for energy transition in vehicles in India. Government has taken initiatives to fight the pollution level by promoting electric vehicles. The government and the manufactures should join the hand to build the infrastructure and for making a positive environment for electric vehicles. With the current depletion of fossil fuels and its price hike, electric vehicles are an alternative solution for this. But, the current market penetration of electric vehicle is very low in India. This paper discusses about scope of electric vehicles and also consumer perception for the same is analysed.

(Tu & Yang, 2019): In this article, 'Key factors influencing consumers' purchase of electric vehicles', discusses about the factors that influences consumers purchasing behaviour of electric vehicles in China. Although, the rapid progress in global economy and technology has advanced human civilization, it also caused many damages to the global ecological environment. As a solution for this, Chinese government introduced a plan that expands electric vehicles market and China become the largest electric vehicle market in the world. Consumers consider electric vehicles as forward-looking technology products with similar driving operation and usage cost compared to traditional vehicles. The government and relevant manufacturers need to consider increasing the publicity of electric vehicles and launch more attractive battery and charging schemes to attract consumers and promote the sustainable development of the automobile industry.

(Motwani & Patil, 2019): In the journal 'Customer buying intention towards electric vehicle in India', it discusses about the people opinion and their awareness about the electric vehicle, reaction to some shortcomings of electric vehicle and will people accept it wholeheartedly. Almost all the vehicle producer in the world have at least one electric vehicle in their product portfolio and around the globe the acceptance of electric people is rapidly growing. Government of India launched FAME scheme to increase the adoption of electric vehicle among masses. Based on this study, the companies should increase its efforts to do promotion based on the significant factors of electric vehicles.

(Acharya, Tyagi, & Bansal, 2021): The report 'Consumer perception towards electric vehicles' discusses about the factors that influence consumer while purchasing vehicles and their perception towards an electric vehicle. A delayed start within the Electric Vehicle selection since the last recent two years has shown a surprising increment. A massive change has been observed in the Electric Vehicle Industry throughout the planet with various nations having to show intent to have maximum electric vehicles, yet no significant change had been found within the Indian EV market. One amongst the many reasons behind this can be an absence of a framework for electric vehicles in India.

(S & M, 2021): This paper 'A study on consumer perception towards electric two-wheelers in Chennai' focuses on understanding the customer perception towards the electric two-wheelers across Chennai city. The automobile companies have felt the need to innovate vehicles that will not depend on fossil fuels. As a result, many companies have invested in R&D to bring forth electric bikes. The lack of awareness, regulatory authority, quality issues are some of the biggest challenges in the EV industry. But with ever-increasing petrol prices and high pollution, sooner electric bikes will put a serious challenge to the Petrol Bikes. At this stage, the primary focus of the company shall lie in R&D, improving quality, and educating people.

(Bhatia, Chauhan, & Kumar, 2022): In this paper, 'Study of factors influencing consumer behaviour towards electric two-wheelers in Gujarat', undertaken with the objective to understand the perception and preferences of consumers towards two-wheeler electric vehicles. Authors have also tried to understand the level of awareness and knowledge of consumers along with their perception on various attributes of two-wheeler with electric wheelers to their decision making process. The analysis of the data collected provides good understanding of consumers' perception and preferences towards two-wheeler electric vehicles. Marketing implications of the findings are also provided which may prove helpful in designing marketing/communication strategies for the marketers of two-wheeler electric vehicles.

Research Methodology

This research was conducted in order to understand the consumer perception towards E-2 wheelers. The research is based on quantitative data. It was a primary source of data. In order to obtain primary data, a structured questionnaire was framed according to the objectives of the study. The objectives are,

- To identify the determinants of consumer buying behavior towards E-2 wheeler.
- To examine the relationship between selected demographic variables and determinants of consumer buying behavior towards E-2 wheelers.
- To examine the relationship between the determinants of consumer buying behavior towards E-2 wheeler and overall consumer satisfaction on E-2 wheelers.

The data was collected from 150 respondents and convenience probability method was used for this. The questionnaire included demographic variables like gender, age, educational background, occupation and monthly income. It also includes questions on awareness on E-2 wheelers, influential factors and the overall satisfaction.
Statistical tools used for analysis are,

- Chi-square test
- Regression
- One way Annova

Results

The data collected has been analyzed using different analytical tools. Data analysis has been done with in a view of objectives of the paper. The results obtained are,

1. X2 VS X9

H0= There is no relation between male and female and their level of awareness on E-2 wheelers. H1= = There is relation between male and female and their level of awareness on E-2 wheelers. Since the P value is .540 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between male and female and level of awareness on E-2 wheelers.
Level of awareness about E-2 wheelers does not differ between male and femal

2. X2 VS X10

H0= There is no relation between male and female and riding of E-2 wheeler. H1= = There is relation between male and female and riding of E-2 wheeler.

Since the P value is .118 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between male and female and riding of E-2 wheeler.
Riding of E-2 wheeler does not differ between male and female.

3. X2 VS X11

H0= There is no relation between male and female and type of currently using bike (conventional or electric 2 wheelers).

H1= = There is relation between male and female and type of currently using bike (conventional or electric 2 wheelers).

Since the P value is .019 which is less than .050 there is no sufficient evidence to accept the null hypothesis (H0). It is inferred that there is relation between male and female and type of currently using bike (conventional or electric 2 wheelers).

Type of currently using bike (conventional or electric 2 wheelers) does differ between male and female.

4. X2 VS X12

H0= There is no relation between male and female and their choice on buying a new 2-wheeler which will be conventional or electric.

H1= = There is relation between male and female and their choice on buying a new 2-wheeler which will be conventional or electric.

Since the P value is .014 which is less than .050 there is no sufficient evidence to accept the null hypothesis (H0). It is inferred that there is relation between male and female and their choice on buying a new 2-wheeler which will be conventional or electric.

Choice on buying a new 2-wheeler (conventional or electric) does differ between male and female.

5. X2 VS X28

H0= There is no relation between male and female and present promotional activities about E-2 wheelers to make the purchase decision.

H1= = There is relation between male and female and present promotional activities about E-2 wheelers to make the purchase decision.

Since the P value is .297 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between male and female and present promotional activities about E-2 wheelers to make the purchase decision.

Present promotional activities about E-2 wheelers to make the purchase decision does not differ between male and female.

6. X3 VS X9

H0= There is no relation between different age groups and their level of awareness on E-2 wheelers.

H1= There is relation between different age groups and their level of awareness on E-2 wheelers.

Since the P value is .022 which is less than .050 there is no sufficient evidence to accept the null hypothesis (H0). It is inferred that there is relation between different age groups and level of awareness on E-2 wheelers.

Level of awareness about E-2 wheelers do differ between different age groups.

7. X3 VS X10

H0= There is no relation between different age groups and riding of E-2 wheeler.
H1= = There is relation between different age groups and riding of E-2 wheeler.

Since the P value is .098 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between different age groups and riding of E-2 wheeler.

Riding of E-2 wheeler does not differ between different age groups.

8. X3 VS X11

H0= There is no relation between different age groups and type of currently using bike (conventional or electric 2 wheelers).
H1= = There is relation between different age groups and type of currently using bike (conventional or electric 2 wheelers).

Since the P value is .504 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between different age groups and type of currently using bike (conventional or electric 2 wheelers).

Type of currently using bike (conventional or electric 2 wheelers) does not differ between different age groups.

9. X3 VS X12

H0= There is no relation between different age groups and their choice on buying a new 2-wheeler which will be conventional or electric.
H1= = There is relation between different age groups and their choice on buying a new 2-wheeler which will be conventional or electric.

Since the P value is .119 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between different age groups and their choice on buying a new 2-wheeler which will be conventional or electric.

Choice on buying a new 2-wheeler (conventional or electric) does not differ between different age groups.

10. X3 VS X28

H0= There is no relation between different age groups and present promotional activities about E-2 wheelers to make the purchase decision.
H1= = There is relation between different age groups and present promotional activities about E-2 wheelers to make the purchase decision.

Since the P value is .116 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between different age groups and present promotional activities about E-2 wheelers to make the purchase decision.

Present promotional activities about E-2 wheelers to make the purchase decision does not differ between different age groups.

11. X4 VS X9

H0= There is no relation between educational background and their level of awareness on E-2 wheelers.

H1= There is relation between educational background and their level of awareness on E-2 wheelers.

Since the P value is .053 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between educational background and level of awareness on E-2 wheelers.

Level of awareness about E-2 wheelers does not differ in different educational backgrounds.

12. X4 VS X10

H0= There is no relation between educational background and riding of E-2 wheeler.

H1= = There is relation between educational background and riding of E-2 wheeler.

Since the P value is .089 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between educational background and riding of E-2 wheeler.

Riding of E-2 wheeler does not differ in different educational background.

13. X4 VS X11

H0= There is no relation between educational background and type of currently using bike (conventional or electric 2 wheelers).

H1= = There is relation between educational background and type of currently using bike (conventional or electric 2 wheelers).

Since the P value is .794 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between educational background and type of currently using bike (conventional or electric 2 wheelers).

Type of currently using bike (conventional or electric 2 wheelers) does not differ in different educational background.

14. X4 VS X12

H0= There is no relation between educational background and their choice on buying a new 2-wheeler which will be conventional or electric.

H1= = There is relation between educational background and their choice on buying a new 2-wheeler which will be conventional or electric.

Since the P value is .073 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between educational background and their choice on buying a new 2-wheeler which will be conventional or electric.

Choice on buying a new 2-wheeler (conventional or electric) does not differ in different educational background.

15. X4 VS X28

H0= There is no relation between educational background and present promotional activities about E-2 wheelers to make the purchase decision.

H1= = There is relation between educational background and present promotional activities about E-2 wheelers to make the purchase decision.

Since the P value is .077 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between educational background and present promotional activities about E-2 wheelers to make the purchase decision.

Present promotional activities about E-2 wheelers to make the purchase decision does not differ in different educational background.

16. X5 VS X9

H0= There is no relation between occupation and their level of awareness on E-2 wheelers. H1= There is relation between occupation and their level of awareness on E-2 wheelers.

Since the P value is .000 which is less than .050 there is no sufficient evidence to accept the null hypothesis (H0). It is inferred that there is relation between occupation and level of awareness on E-2 wheelers.

Level of awareness about E-2 wheelers does differ in different occupation.

17. X5 VS X10

H0= There is no relation between occupation and riding of E-2 wheeler. H1= = There is relation between occupation and riding of E-2 wheeler.

Since the P value is .680 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between occupation and riding of E-2 wheeler.

Riding of E-2 wheeler does not differ in different occupation.

18. X5 VS X11

H0= There is no relation between occupation and type of currently using bike (conventional or electric 2 wheelers).

H1= = There is relation between occupation and type of currently using bike (conventional or electric 2 wheelers).

Since the P value is .061 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between occupation and type of currently using bike (conventional or electric 2 wheelers).

Type of currently using bike (conventional or electric 2 wheelers) does not differ in different occupation.

19. X5 VS X12

H0= There is no relation between occupation and their choice on buying a new 2-wheeler which will be conventional or electric.

H1= = There is relation between occupation and their choice on buying a new 2-wheeler which will be conventional or electric.

Since the P value is .983 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between occupation and their choice on buying a new 2-wheeler which will be conventional or electric.

Choice on buying a new 2-wheeler (conventional or electric) does not differ in different occupation.

20. X5 VS X28

H0= There is no relation between occupation and present promotional activities about E-2 wheelers to make the purchase decision.

H1= = There is relation between occupation and present promotional activities about E-2 wheelers to make the purchase decision.

Since the P value is .305 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between occupation and present promotional activities about E-2 wheelers to make the purchase decision.

Present promotional activities about E-2 wheelers to make the purchase decision does not differ in different occupation.

21. X6 VS X9

H0= There is no relation between monthly income and their level of awareness on E-2 wheelers.

H1= There is relation between monthly income and their level of awareness on E-2 wheelers.

Since the P value is .977 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between monthly income and level of awareness on E-2 wheelers.

Level of awareness about E-2 wheelers does not differ between monthly incomes.

22. X6 VS X10

H0= There is no relation between monthly income and riding of E-2 wheeler. H1= = There is relation between monthly income and riding of E-2 wheeler.

Since the P value is .581 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between monthly income and riding of E-2 wheeler.

Riding of E-2 wheeler does not differ between monthly incomes.

23. X6 VS X11

H0= There is no relation between monthly income and type of currently using bike (conventional or electric 2 wheelers).

H1= = There is relation between monthly income and type of currently using bike (conventional or electric 2 wheelers).

Since the P value is .651 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between monthly income and type of currently using bike (conventional or electric

2 wheelers).

Type of currently using bike (conventional or electric 2 wheelers) does not differ between monthly incomes.

24. X6 VS X12

H0= There is no relation between monthly income and their choice on buying a new 2-wheeler which will be conventional or electric.

H1= = There is relation between monthly income and their choice on buying a new 2-wheeler which will be conventional or electric.

Since the P value is .034 which is less than .050 there is no sufficient evidence to accept the null hypothesis (H0). It is inferred that there is relation between monthly income and their choice on buying a new 2-wheeler which will be conventional or electric.

Choice on buying a new 2-wheeler (conventional or electric) does differ between monthly incomes.

25. X6 VS X28

H0= There is no relation between monthly income and present promotional activities about E-2 wheelers to make the purchase decision.

H1= = There is relation between monthly income and present promotional activities about E-2 wheelers to make the purchase decision.

Since the P value is .629 which is greater than .050 there is sufficient evidence to accept the null hypothesis (H0). It is inferred that there is no relation between monthly income and present promotional activities about E-2 wheelers to make the purchase decision.

Present promotional activities about E-2 wheelers to make the purchase decision does not differ between monthly incomes.

26. X29 VS X18 X19 X20 X21 X22

H0=There is no relation between overall satisfaction derived from E- 2 wheelers and factors not influencing to buy E-2 wheelers.

H1= There is relation between overall satisfaction derived from E- 2 wheelers and factors not influencing to buy E-2 wheelers.

Since the independent variable i.e., initial cost to purchase has a relation with the overall satisfaction derived from E- 2 wheelers and factors not influencing to buy E-2 wheelers. Therefore reject H0.

Since the independent variable i.e., power delivery, recharging inconvinence, more time for recharging, low resale value has no relation with the overall satisfaction derived from E- 2 wheelers and factors not influencing to buy E-2 wheelers. Therefore accept H0.

27. X29 VS X13 X14 X15 X16 X17

H0=There is no relation between overall satisfaction derived from E- 2 wheelers and factors influencing to buy E- 2 wheeler.

H1= There is relation between overall satisfaction derived from E- 2 wheelers and

factors influencing to buy E- 2 wheeler.

Since the independent variable i.e. reduce dependency on fossil fuels, produce less carbo emission, low cost of maintenance, easy to drive, low cost of fuel has no relation with the overall satisfaction derived from E- 2 wheelers and factors influencing to buy E-2 wheelers. Therefore accept H0.

28. X29 VS X2

H0=there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers between male and female.

H1= there is difference in the perception of degree of overall satisfaction of using E-2 wheelers between male and female.

Since the P value is .841 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers between male and female.

29. X29 VS X3

H0=there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers among different age group.

H1= there is difference in the perception of degree of overall satisfaction of using E-2 wheelers different age group.

Since the P value is .119 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers among different age group.

30. X29 VS X4

H0=there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers and educational background.

H1= there is difference in the perception of degree of overall satisfaction of using E-2 wheelers and educational background.

Since the P value is .262 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers and educational background.

31. X29 VS X5

H0=there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers and occupation.

H1= there is difference in the perception of degree of overall satisfaction of using E-2 wheelers and occupation.

Since the P value is .225 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers and occupation.

32. X29 VS X6

H0=there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers and monthly income.

H1= there is difference in the perception of degree of overall satisfaction of using E-2 wheelers and monthly income.

Since the P value is .361 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers and monthly income.

33. X29 VS X28

H0=there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

H1= there is difference in the perception of degree of overall satisfaction of using E-2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

Since the P value is .406 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the perception of degree of overall satisfaction of using E-2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

34. X23 VS X2

H0=there is no difference in the speed of E-2 wheelers when compared to conventional 2 wheelers between male and female.

H1= there is difference in the speed of E-2 wheelers when compared to conventional 2 wheelers between male and female.

Since the P value is .014 which is less than .050, there is no sufficient evidence to accept the null hypothesis. So it is concluded that there is difference in the speed of E-2 wheelers when compared to conventional 2 wheelers between male and female.

35. X23 VS X3

H0=there is no difference in the speed of E-2 wheelers when compared to conventional 2 wheelers among different age group.

H1= there is difference in the speed of E-2 wheelers when compared to conventional 2 wheelers among different age group.

Since the P value is .737 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the speed of E-2 wheelers when compared to conventional 2 wheelers among different age group.

36. X23 VS X4

H0=there is no difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and educational background.

H1= there is difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and educational background.

Since the P value is .600 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and educational background.

37. X23 VS X5

H0=there is no difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and occupation.

H1= there is difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and occupation.

Since the P value is .792 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and occupation.

38. X23 VS X6

H0=there is no difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

H1= there is difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

Since the P value is .483 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

39. X23 VS X28

H0=there is no difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

H1= there is difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

Since the P value is .972 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the speed of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

40. X24 VS X2

H0=there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers between male and female.

H1= there is difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers between male and female.

Since the P value is .108 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers between male and female.

41. X24 VS X3

H0=there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers among different age group.

H1= there is difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers among different age group.

Since the P value is .223 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers among different age group.

42. X24 VS X4

H0=there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and educational background.

H1= there is difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and educational background.

Since the P value is .638 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and educational background.

43. X24 VS X5

H0=there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and occupation.

H1= there is difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and occupation.

Since the P value is .163 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and occupation.

44. X24 VS X6

H0=there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

H1= there is difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

Since the P value is .743 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

45. X24 VS X28

H0=there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

H1= there is difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

Since the P value is .540 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the mileage of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

46. X25 VS X2

H0=there is no difference in the price of E-2 wheelers when compared to conventional 2 wheelers between male and female.

H1= there is difference in the price of E-2 wheelers when compared to conventional 2 wheelers between male and female.

Since the P value is .227 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the price of E-2 wheelers when compared to conventional 2 wheelers between male and female.

47. X25 VS X3

H0=there is no difference in the price of E-2 wheelers when compared to conventional 2 wheelers among different age group.

H1= there is difference in the price of E-2 wheelers when compared to conventional 2 wheelers among different age group.

Since the P value is .630 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the price of E-2 wheelers when compared to conventional 2 wheelers among different age group.

48. X25 VS X4

H0=there is no difference in the price of E-2 wheelers when compared to conventional 2 wheelers and educational background.

H1= there is difference in the price of E-2 wheelers when compared to conventional 2 wheelers and educational background.

Since the P value is .131 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the price of E-2 wheelers when compared to conventional 2 wheelers and educational background.

49. X25 VS X5

H0=there is no difference in the price of E-2 wheelers when compared to conventional 2 wheelers and occupation.

H1= there is difference in the price of E-2 wheelers when compared to conventional 2 wheelers and occupation.

Since the P value is .047 which is less than .050, there is no sufficient evidence to accept the null hypothesis. So it is concluded that there is difference in the price of E-2 wheelers when compared to conventional 2 wheelers and occupation.

50. X25 VS X6

H0=there is no difference in the price of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

H1= there is difference in the price of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

Since the P value is .719 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the price of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

51. X25 VS X28

H0=there is no difference in the price of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

H1= there is difference in the price of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

Since the P value is .322 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the price of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

52. X26 VS X2

H0=there is no difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers between male and female.

H1= there is difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers between male and female.

Since the P value is .030 which is less than .050, there is no sufficient evidence to accept the null hypothesis. So it is concluded that there is difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers between male and female.

53. X26 VS X3

H0=there is no difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers among different age group.

H1= there is difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers among different age group.

Since the P value is .675 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers among different age group.

54. X26 VS X4

H0=there is no difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and educational background.

H1= there is difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and educational background.

Since the P value is .297 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and educational background.

55. X26 VS X5

H0=there is no difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and occupation.

H1= there is difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and occupation.

Since the P value is .544 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and occupation.

56. X26 VS X6

H0=there is no difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

H1= there is difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

Since the P value is .724 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

57. X26 VS X28

H0=there is no difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision. H1= there is difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

Since the P value is .666 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the service cost of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

58. X27 VS X2

H0=there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers between male and female.

H1= there is difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers between male and female.

Since the P value is .067 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers between male and female.

59. X27 VS X3

H0=there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers among different age group.

H1= there is difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers among different age group.

Since the P value is .198 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers among different age group.

60. X27 VS X4

H0=there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and educational background.

H1= there is difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and educational background.

Since the P value is .071 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and educational background.

61. X27 VS X5

H0=there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and occupation.

H1= there is difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and occupation.

Since the P value is .501 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and occupation.

62. X27 VS X6

H0=there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

H1= there is difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

Since the P value is .210 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and monthly income.

63. X27 VS X28

H0=there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

H1= there is difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

Since the P value is .718 which is greater than .050, there is sufficient evidence to accept the null hypothesis. So it is concluded that there is no difference in the after sales service of E-2 wheelers when compared to conventional 2 wheelers and present promotional activities about E-2 wheelers to make purchase decision.

Discussion

An electric vehicle, unlike a conventional vehicle, is quite flexible. This is because of the less number of moving parts that are important in working of a conventional vehicle. In an electric vehicle, the number of moving parts is limited to one, the motor. It can be run by different control mechanism.

In recent times, electric vehicles are on massive rise, there are many reasons behind it. The most prominent one is their contribution in reducing the pollution. In order to understand the topic better, statistical tools such as Chi-square, Annova and Regression are used.

To understand if there was an association between demographic variables and consumer's familiarity and knowledge with the E-2 wheelers, Chi-square test was conducted and the following were the results obtained. From the interpretation, it is clear that the level of awareness on E-2 wheelers is not associated with demographic factors like gender, educational background and monthly income. That means, it do not affect the demographic variables.

On the other hand, level of awareness have an association with variables like age and occupation. That means, based on age and occupation, the level of awareness on E-2 wheelers could differ.

The riding of E-2 wheelers is not associated with gender, age group, education background, occupation and monthly income. That it means, it these demographic variables do not affect riding of E-2 wheelers.

The currently using 2 wheeler type is not associated with age group, educational background, occupation and monthly income. It is associated with gender. That means, currently using 2 wheeler type is associated with gender.

Choice of buying new 2 wheeler type is not associated with age group, educational background, and occupation. It is associated with gender and monthly income.

Present promotional activities of E-2 wheelers is not associated with gender, educational background, occupation and monthly income.

To find out the essential factors that do not encouraging and do encouraging to buy E-2 wheelers have an influence with the overall satisfaction derived from E-2 wheelers, a regression analysis was conducted and the results were as follows.

It was inferred that the independent variable i.e., initial cost to purchase has a relation with the overall satisfaction derived from E- 2 wheelers and factors not influencing to buy E-2 wheelers. It was also find out that the independent variables i.e., power delivery, recharging inconvenience, more time for recharging, low resale value has no relation with the overall satisfaction derived from E- 2 wheelers and factors not influencing to buy E-2 wheelers.

The independent variables that influence to buy E-2 wheelers i.e. reduce dependency on fossil fuels, produce less carbo emission, low cost of maintenance, easy to drive and low cost of fuel has no relation with the overall satisfaction derived from E- 2 wheelers.

In order to understand if the demographic variables have an influence on the overall satisfaction derived from using E-2 wheelers and opinion of consumers towards factors like speed, mileage, price, service cost and after sale service of E-2 wheelers when compared to conventional 2 wheelers, an Annova test was conducted and the results obtained were as follows.

On conducting an ANOVA test, it was seen that there was no significant difference between the overall level of satisfaction of E-2 wheelers experience obtained by the customers of different gender, age groups, education background, occupation, monthly income and present promotional activities. It means that the overall level of satisfaction derived from E-2 wheeler experiences obtained by the customers have no effect based on different gender, age groups, education background, occupation, monthly income and present promotional activities.

It was seen that according to the opinion of customers, there was no significant difference between the speed of E-2 wheelers when compared to conventional 2 wheeler and of different age groups, education background, occupation, monthly income and present promotional activities. It means that according to the opinion of customers , the speed of E-2 wheelers when compared to conventional 2 wheeler have no effect based on different age groups, education background, occupation, monthly income and present promotional activities. On the other hand, it is seen that there is significant difference in gender and speed of E-2 wheelers when compared to conventional 2 wheelers.

It was seen that according to the opinion of customers, there was no significant difference between the mileage of E-2 wheelers when compared to conventional 2 wheeler and of different gender, age groups, education background, occupation, monthly income and present promotional activities. It means that the mileage of E-2 wheelers when compared to conventional 2 wheeler have no effect based on different gender, age groups, education background, occupation, monthly income and present promotional activities.

It was seen that according to the opinion of customers, there was no significant difference between the price of E-2 wheelers when compared to conventional 2 wheeler and of different gender, age groups, education background, occupation, monthly income and present promotional activities. It means that the price of E-2 wheelers when compared to conventional 2 wheeler have no effect based on different gender, age groups, education background, occupation, monthly income and present promotional activities.

It was seen that according to the opinion of customers, there was no significant difference between the service cost of E-2 wheelers when compared to conventional 2 wheeler and of different age groups, education background, occupation, monthly income and present promotional activities. It means that the service cost of E-2 wheelers when compared to conventional 2 wheeler have no effect based on different age groups, education background, occupation, monthly income and present promotional activities. On the other hand, it is seen that there is significant difference in gender and service cost of E-2 wheelers when compared to conventional 2 wheelers.

It was seen that according to the opinion of customers, there was no significant difference between the after sales service of E-2 wheelers when compared to conventional 2 wheeler and of different gender, age groups, education background, occupation, monthly income and present promotional activities. It means that the after sales service of E-2 wheelers when compared to conventional 2 wheeler have no effect based on different gender, age groups, education background, occupation, monthly income and present promotional activities.

II. CONCLUSION

This entire study brings out the perception of consumers buying behavior towards the Electric or E-2 wheelers. Consumer behavior comprises of all individual behavior that goes into producing before and post-purchase decisions. It became clearer that lack of awareness, regulatory authority, quality issues are some of the biggest challenges in the industry. But with ever-increasing petrol prices and high pollution, sooner electric bikes will put a serious challenge to the Petrol Bikes. At this stage, the primary focus of the company shall lie in R&D, improving quality, and educating people.

As globally people are getting more and more conscious towards environment-friendly living, it's the right time for the two-wheeler industry also to move towards its eco-friendly option of electric vehicles. Electric two-wheelers can solve a big global issue of oil availability and pollution control. Overall satisfaction derived by customers from E-2 wheelers are satisfactory. It can take the world to a new era if all customers understand its value and start using only electric vehicles. Electric two-wheelers can make the world a better place to leave by reducing pollution at a higher rate.

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APPENDIX

1. Name (optional)
2. Gender
   - □ Male
   - □ Female
   - □ Others
3. Age group
   - □ 18-25
   - □ 26-35
   - □ 36-45
   - □ 46-60
   - □ 60 above
4. Educational background
   - □ Upto 10^{th}
   - □ Upto 12^{th}
   - □ Under-graduation
   - □ Post-graduation
   - □ Profession
5. What is your occupation?
   - □ Student
   - □ Home maker
   - □ Government employee
   - □ Private company employee
   - □ Professional
   - □ Others
6. Monthly income
   - □ Less than 25,000
   - □ 25,001-40,000
   - □ 40,001-60,000
   - □ 60,001-80,000
   - □ Above 80,000

7. Which terrain did you usually ride your 2-wheeler?

Sl No	Factors	Most unlikely	Unlikely	Neutral	Likely	Most likely
1	Plain terrain					
2	Hilly terrain					

8. Are you aware of E-2 wheelers?
   - □ Yes
   - □ No
9. Did you ever ride an E-2 wheeler?
   - □ Yes
   - □ No
10. Which bike are you using currently?
    - □ Conventional 2-wheeler
    - □ Electric 2-wheeler
11. If you are going to buy a new 2-wheeler, which type of vehicle do you choose?
    - □ Conventional 2-wheeler
    - □ Electric 2-wheeler
12. Which of the factors that encourage you to buy a E-2 wheeler?

Sl No	Factors	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Reduce dependency on fossil fuels					
2	Produce less carbon emission					
3	Low cost of maintenance					
4	Easy to drive					
5	Low cost of fuel					

13. Which of the factors that do not encourage you to buy a E-2 wheeler?

Sl No	Factors	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Power delivery					
2	Initial cost to purchase					
3	Recharging inconvenience					

4	Recharging takes more time					
5	Low resale value					

14. What is your opinion towards the following factors when compared to conventional 2 wheelers?

Sl No	**Factors**	**Very low**	**Low**	**Moderate**	**High**	**Very high**
1	Speed of E-2 wheelers					
2	Mileage of E-2 wheelers					
3	Price of the E-2 wheelers					
4	Service cost of E-2 wheelers					
5	After sales service					

15. Is the present promotional activity about E-2 wheeler sufficient enough for you to make the purchase decision?
    - □ Yes
    - □ No
16. Rate yourself the level of overall satisfaction you derive on E-2 wheelers(scale)
    - Most unsatisfactory
    - Unsatisfactory
    - Neutral
    - Satisfactory
    - Most satisfactory