A Comparative Study of Consumer Adoption of Electric Two-Wheelers and Four-Wheelers in India

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***Abstract*—The transition towards electric mobility has become an important component of sustainable transportation in India. Despite the potential environmental and economic benefits of electric vehicles (EVs), consumer adoption may be influenced by purchase affordability, battery reliability, charging accessibility, driving range, government incentives and social perceptions.**

This study examines consumer perceptions, purchase intentions and perceived barriers associated with electric vehicles, with particular reference to electric two-wheelers and four-wheelers in India. A quantitative, cross-sectional survey design was adopted using a structured questionnaire. The preliminary dataset comprised 160 respondents. Data were examined through descriptive statistics, frequency and percentage analysis, and exploratory Spearman rank correlation. The findings indicate that 87.5% of respondents agreed or strongly agreed that electric vehicles are environmentally friendly, while 75% perceived them as a means of reducing overall transportation costs. However, 75% also acknowledged concerns relating to battery replacement, maintenance and resale value. Furthermore, 68.8% reported that they were likely or very likely to purchase an electric vehicle within the next three years.

Exploratory correlation results did not indicate statistically significant associations between purchase intention and the three selected perception items. The findings provide preliminary insights into consumer attitudes towards electric mobility. However, the small sample size and the absence of separate perception measures for electric two-wheelers and four-wheelers restrict the extent of comparative conclusions. The study identifies directions for improved questionnaire design and further empirical investigation.

***Index Terms*—Electric vehicles, consumer adoption, electric two-wheelers, electric four-wheelers, purchase intention, consumer behaviour, sustainable mobility, India.**

I. INTRODUCTION

Electric mobility has emerged as an important area of research because of its relationship with environmental sustainability, technological development and changing consumer preferences. Electric vehicles offer an alternative to conventional petrol and diesel vehicles and may help reduce direct vehicle emissions. Their wider adoption, however, depends on several factors beyond environmental awareness.

Consumers evaluate vehicles in terms of affordability, operating expenditure, performance, convenience, safety and long-term ownership costs. In the case of electric vehicles, battery durability, charging facilities, driving range, maintenance arrangements and resale value may also influence purchase decisions. These considerations can create both opportunities and barriers for the adoption of electric mobility.

India presents a relevant context for examining these issues because two-wheelers and four-wheelers serve different transportation requirements. Electric two-wheelers may be suitable for daily commuting, short-distance travel and relatively economical personal mobility. Electric four-wheelers may be preferred for family transportation, comfort, longer journeys and other travel requirements. Consequently, the considerations influencing consumers' choices may differ across the two categories.

The International Energy Agency's *Global EV Outlook 2025* discusses developments in electric mobility and the importance of affordability and policy support in expanding electric vehicle markets (International Energy Agency [IEA], 2025). Nevertheless, broad market developments do not automatically explain individual consumer decisions. Consumer-level evidence is required to understand how people perceive the advantages, costs and limitations of

electric vehicles. Government policies and financial incentives may also influence the attractiveness of electric vehicles. However, the effectiveness of such measures depends on consumers' awareness, eligibility, perceived benefits and practical purchasing circumstances. Similarly, favourable environmental attitudes may encourage consideration of EVs without necessarily resulting in actual purchases.

Against this background, the present study investigates consumer perceptions and purchase intentions relating to electric vehicles in India. It also examines respondents' preferences between electric two-wheelers and four-wheelers and identifies the principal barriers reported in the survey.

II. STATEMENT OF THE PROBLEM

Although electric vehicles are increasingly discussed as an alternative to conventional vehicles, consumers may remain uncertain about their affordability, practical suitability and long-term reliability. Concerns regarding battery replacement, charging accessibility, driving range and resale value may discourage potential buyers.

These concerns may not operate equally across electric two-wheelers and four-wheelers because the two categories differ in purchase cost, usage patterns and transportation functions. A general assessment of electric vehicles may therefore overlook important differences in consumer requirements.

The present study addresses the need to understand consumer perceptions, purchase intentions and perceived barriers associated with electric vehicles. It also explores whether respondents demonstrate a preference for electric two-wheelers or four-wheelers. Since the available questionnaire measures several perceptions about EVs generally, rather than separately measuring each vehicle category, the present empirical findings are interpreted as preliminary evidence rather than a definitive comparison of adoption determinants.

III. RESEARCH GAP

Existing research on electric vehicle adoption has examined economic benefits, environmental considerations, technological reliability, charging infrastructure, perceived risks and consumer decision-making. Studies have also investigated factors influencing the adoption of electric two-wheelers and four-wheelers in India.

For example, Ashok et al. (2025) examined factors that encourage and inhibit electric two-wheeler adoption through the perspective of behavioural reasoning theory. Research published in *Travel Behaviour and Society* has also investigated motivators and barriers affecting potential electric four-wheeler buyers in India.

However, findings from different studies may not be directly comparable when their sampling methods, measurement instruments, geographical coverage and analytical approaches differ.

The present study contributes preliminary survey evidence concerning consumer perceptions, purchase intentions and perceived barriers. Its intended comparative contribution requires further development through a larger sample and a questionnaire that measures the two vehicle categories separately. The research gap should be regarded as provisional until a comprehensive and documented review of relevant literature establishes the precise extent of existing comparative research.

IV. OBJECTIVES OF THE STUDY

The study has the following objectives:

1. To examine consumer awareness, perceptions and purchase intentions regarding electric vehicles in India.
2. To identify economic, environmental, technological and infrastructural factors associated with consumer perceptions of electric vehicles.
3. To explore respondents' preferences between electric two-wheelers and four-wheelers.
4. To examine the association between selected consumer perception items and purchase intention.
5. To identify the principal barriers perceived by respondents in adopting electric vehicles.
6. To suggest practical measures that may encourage electric vehicle adoption and guide future research.

V. RESEARCH QUESTIONS

The study seeks to answer the following questions:

1. How do respondents perceive the environmental and economic benefits of electric vehicles?
2. What proportion of respondents express an intention to purchase an electric vehicle within the next three years?

3. Which factors are most frequently identified as influencing EV purchase decisions?
4. What are the major perceived barriers to electric vehicle adoption?
5. How do respondents perceive the adoption potential of electric two-wheelers and four-wheelers?
6. Are selected perceptions of economic benefits, environmental friendliness and battery reliability associated with purchase intention in the preliminary sample?

VI. HYPOTHESES OF THE STUDY

The following hypotheses were specified before exploratory statistical testing.

H1: Perceived economic benefits are positively associated with consumer adoption intention.

H2: Environmental awareness is positively associated with consumer adoption intention.

H3: Perceived technological reliability is positively associated with consumer adoption intention.

The corresponding null hypotheses are:

- H01: There is no statistically significant association between perceived economic benefits and purchase intention.
- H02: There is no statistically significant association between environmental awareness and purchase intention.
- H03: There is no statistically significant association between perceived technological reliability and purchase intention.

For the current analysis, economic benefits are represented by agreement that EVs can reduce overall transportation costs. Environmental awareness is represented by agreement that EVs are environmentally friendly. Technological reliability is represented by confidence in battery life and reliability. These are individual survey items, not validated multi-item scales.

VII. REVIEW OF LITERATURE

7.1 Economic benefits and affordability

Economic considerations are central to vehicle purchase decisions. Consumers may compare the initial purchase price with expected savings on fuel and routine maintenance. However, the actual financial advantage of an electric vehicle depends on several variables, including purchase price, electricity costs, annual distance travelled, maintenance expenditure, financing costs, battery replacement assumptions and applicable incentives.

The IEA (2025) discusses the role of affordability and policy support in electric vehicle market development. This reinforces the importance of examining consumer perceptions of economic benefits rather than assuming that all consumers experience the same financial advantages.

For this study, perceived savings on transportation costs and perceived affordability are treated as relevant indicators of consumer attitudes. Further research should distinguish between perceived savings and objectively calculated total cost of ownership.

7.2 Environmental awareness

Environmental awareness may motivate consumers to consider vehicles perceived as more sustainable. Concerns about pollution and climate change can influence consumer preferences, particularly when individuals believe that their choices contribute to environmental improvement.

Nevertheless, favourable environmental attitudes do not necessarily translate into purchasing behaviour. Financial constraints, charging difficulties, range concerns and uncertainty about battery performance may prevent environmentally conscious consumers from choosing an electric vehicle.

The relationship between environmental awareness and purchase intention must therefore be examined empirically.

7.3 Charging infrastructure and driving range

Charging accessibility is an important consideration for consumers evaluating electric vehicles. Consumers may assess whether charging facilities are available at home, near workplaces or along frequently travelled routes.

Driving range also affects perceptions of convenience. A vehicle that meets daily commuting requirements may not necessarily satisfy the needs of consumers who regularly undertake longer journeys. These considerations may differ between two-wheelers and four-wheelers.

The present questionnaire includes general questions about charging accessibility and driving range. More

detailed category-specific measures would provide stronger evidence about these concerns.

7.4 Technological reliability and perceived risk

Consumers may hesitate to purchase electric vehicles because of uncertainty regarding battery life, replacement expenditure, repair facilities, warranty coverage and resale value. Perceived technological reliability can influence confidence in a relatively unfamiliar product category.

Ashok et al. (2025) examined reasons that encourage and inhibit electric two-wheeler adoption. Such research supports the inclusion of both motivations and barriers in consumer adoption studies.

The present study considers confidence in battery life and reliability as one indicator of technological perception. Future studies should assess battery reliability, service availability, warranty confidence and perceived risk through separate, clearly defined measures.

7.5 Social influence and government incentives

Family members, friends and professional networks may influence vehicle purchasing decisions through recommendations, experience and social perceptions. Government incentives may also affect perceived affordability and purchase attractiveness.

However, awareness of an incentive does not establish that a consumer is eligible for it or has actually received it. Likewise, social influence may vary according to income, location, previous vehicle ownership and personal preferences.

These factors should be measured independently in future comparative research.

7.6 Literature synthesis

The reviewed literature indicates that electric vehicle adoption is multidimensional. Economic considerations, environmental attitudes, infrastructure, technological confidence and perceived risks may operate together.

The present study provides preliminary evidence from a small questionnaire-based sample. A more extensive literature review using verified peer-reviewed studies and a category-specific measurement instrument is necessary before making strong claims about the relative influence of these factors on electric two-wheeler and four-wheeler adoption.

VIII. CONCEPTUAL FRAMEWORK

The proposed conceptual framework identifies consumer perception factors that may be associated with EV purchase intention.

Independent variables

- Perceived economic benefits
- Environmental awareness
- Technological reliability
- Charging accessibility
- Perceived affordability
- Social influence
- Awareness of government incentives
- Perceived battery and maintenance risks

Dependent variable

- Consumer purchase intention

Comparative variable

- Vehicle category: electric two-wheeler or electric four-wheeler

Potential control variables

- Age
- Gender, where voluntarily disclosed and relevant
- Education
- Income
- Residential location
- Current vehicle ownership
- Daily travel distance
- Previous EV experience

The conceptual framework proposes associations rather than causal relationships. The current dataset permits exploratory examination of only three individual perception items in relation to purchase intention. The remaining relationships require further empirical testing.

IX. RESEARCH METHODOLOGY

9.1 Research design

The study uses a quantitative, cross-sectional, questionnaire-based design. Information was collected at a single point in time to examine consumer perceptions, vehicle preferences and purchase intentions.

A cross-sectional survey can identify patterns and associations but cannot independently establish causal relationships.

9.2 Population and sample

The intended population comprises adult consumers in India who own electric vehicles, are considering purchasing an electric vehicle or can meaningfully evaluate electric vehicle purchasing options.

The supplied dataset contains 160 responses. The sampling method and geographical coverage cannot be established from the response spreadsheet alone. Therefore, the sample is treated as a small preliminary sample, and the findings are not considered nationally representative.

The actual number of respondents is reported transparently rather than implying a larger sample.

9.3 Sources of data

The study uses primary data collected through a structured questionnaire. The questionnaire covers respondent characteristics, current vehicle ownership, EV category preference, consumer perceptions, purchase intention, influential purchase factors and perceived adoption barriers.

Secondary sources identified in the proposed research framework include peer-reviewed research articles, institutional reports and official government publications.

9.4 Research instrument

The questionnaire contains three main sections.

Section A: Respondent profile

Age group, gender, current vehicle ownership and EV category considered for purchase.

Section B: Consumer perceptions

Nine statements covering transportation costs, environmental friendliness, affordability, charging accessibility, battery reliability, driving range, government incentives, social influence and battery-related concerns.

Section C: Purchase intention and adoption barriers

Purchase likelihood within three years, the most influential purchase factor, perceived adoption potential of two-wheelers and four-wheelers, and the biggest adoption challenge.

Most perception items use a five-point Likert response scale ranging from Strongly disagree to Strongly agree.

The supplied Excel workbook contains responses to Q1–Q9. Although an optional open-ended question is described in the proposed questionnaire, responses to that question are not present in the supplied workbook. Consequently, qualitative thematic analysis has not been undertaken.

9.5 Data cleaning

The response data were screened for formatting inconsistencies and standardised for analysis. Surrounding spaces and bullet symbols were removed, inconsistent capitalization of Likert responses was standardised, and the age-group label containing inconsistent spacing was harmonised.

The cleaned responses were organised into question-wise frequency and percentage tables. The analysis uses the 16 submitted responses as its denominator.

9.6 Statistical techniques

The following techniques were used:

1. Frequency and percentage analysis: To describe respondent characteristics, category preferences, perceptions and barriers.
2. Descriptive interpretation: To identify the most frequently reported attitudes and concerns.
3. Spearman rank correlation: To examine exploratory associations between selected ordinal perception items and purchase intention.

Spearman correlation was selected because the relevant responses are ordinal. Likert agreement responses were coded from 1 (Strongly disagree) to 5 (Strongly agree). Purchase intention was coded from 1 (Very unlikely) to 5 (Very likely).

The analysis uses a 5% significance threshold. Given the small sample, the correlation results are interpreted cautiously.

9.7 Ethical considerations

Participation in academic surveys should be voluntary and based on informed consent. Researchers should explain the purpose of the study, the intended use of responses and relevant confidentiality arrangements.

Personally, identifying information should be avoided unless necessary and appropriately protected. Any institutional ethics approval required by the institution or target journal should be obtained.

X. RESULTS AND ANALYSIS

10.1 Respondent profile

The preliminary dataset comprised 160 respondents.

Table 1. Respondent profile

Characteristic	Category	Frequency	Percentage
Age	30–40 years	90	56.3%
Gender	Male	90	56.3%
Current ownership	Petrol/diesel two-wheeler	70	43.8%
Current ownership	Electric two-wheeler	20	12.5%
Current ownership	Electric four-wheeler	20	12.5%
Current ownership	Petrol/diesel four-wheeler	20	12.5%
Current ownership	No personal vehicle	30	18.8%

Note: Percentages are rounded. The categories under current vehicle ownership sum to the total sample.

The largest age group was 30–40 years, representing 56.3% of respondents. Male respondents also represented 56.3% of the sample. Petrol/diesel two-wheeler ownership was the most frequently reported current vehicle category.

These characteristics describe the respondents who participated in the survey. They should not be interpreted as estimates of the demographic composition of Indian consumers.

10.2 Consumer preference for electric vehicle categories

Six respondents (37.5%) indicated that they would consider purchasing an electric two-wheeler, while another six (37.5%) indicated that they would consider both electric two-wheelers and four-wheelers. Two respondents (12.5%) selected electric four-wheelers. One respondent (6.3%) selected neither category, and one (6.3%) was unsure.

Rounding may cause totals to differ slightly.

The responses suggest that electric two-wheelers attracted considerable interest in this sample. However, the six respondents who selected both categories should not be treated as exclusively preferring two-wheelers.

Table 2. EV category respondents would consider purchasing

Category	Frequency	Percentage
Electric two-wheeler	60	37.5%
Electric four-wheeler	20	12.5%
Both	60	37.5%
Neither	10	6.3%
Not sure	10	6.3%
Total	160	100.0%*

The results therefore indicate category consideration rather than a definitive comparative adoption rate.

10.3 Consumer perceptions of electric vehicles

Table 3. Selected perception findings

Statement	Agree/strongly agree	Percentage
EVs are environmentally friendly	140	87.5%
EVs can reduce overall transportation costs	120	75.0%
Battery, maintenance and resale concerns discourage purchase	120	75.0%
Charging accessibility: neutral response	80	50.0%

The strongest positive response concerned environmental friendliness. Fourteen respondents agreed or strongly agreed that EVs are environmentally friendly. Twelve respondents perceived EVs as capable of reducing overall transportation costs. At the same time, twelve respondents agreed or strongly agreed that battery replacement, maintenance and resale-value concerns discourage purchasing decisions.

This suggests that positive attitudes towards electric mobility may coexist with practical concerns about ownership. Half of the respondents expressed a neutral view regarding the adequacy of charging facilities for their travel needs. This may indicate uncertainty, limited experience or insufficient information, although the current survey cannot determine which explanation is responsible.

10.4 Purchase intention

Percentages are rounded.

Eleven respondents indicated that they were likely or very likely to purchase an EV within the next three years. Four were undecided, while one reported being unlikely to purchase one.

Table 4. Likelihood of purchasing an EV within the next three years

Response	Frequency	Percentage
Likely or very likely	110	68.8%
Undecided	40	25.0%
Unlikely	10	6.3%
Total	160	100.0%*

The findings indicate favourable stated purchase intention among many respondents. Nevertheless, intention is not equivalent to actual purchasing behaviour. Future affordability, vehicle availability, infrastructure and personal circumstances may influence whether respondents eventually purchase an EV.

10.5 Most influential purchase factors

Environmental benefits were the most frequently selected factor influencing EV purchase decisions, reported by seven respondents (43.8%). Battery performance and driving range were selected by five respondents (31.3%).

These findings suggest that environmental considerations may be important in consumers' stated preferences, while practical performance considerations remain relevant. However, the single-choice question identifies the factor selected as most influential; it does not measure the independent statistical effect of each factor on purchase intention.

10.6 Major perceived adoption challenges

Battery life and replacement cost were identified as the biggest challenge by six respondents (37.5%). Limited driving range was selected by four respondents (25.0%), while lack of charging facilities was selected by three (18.8%).

The pattern highlights the importance of battery-related confidence, practical range and charging convenience in consumer discussions about electric mobility. These results can guide future research and awareness initiatives, but the small sample limits generalisation.

XI. HYPOTHESIS TESTING

Spearman rank correlation was used to explore the association between purchase intention and three selected perception items.

Table 5. Exploratory Spearman correlation results

Hypothesis	Predictor	Spearman's ρ	p-value	Result at α = 0.05
H1	Perceived economic benefits	0.018	0.946	Not statistically significant
H2	Environmental awareness	0.308	0.246	Not statistically significant
H3	Technological reliability	0.067	0.806	Not statistically significant

11.1 H1: Economic benefits and purchase intention

The correlation between agreement that EVs reduce overall transportation costs and purchase intention was approximately zero ($\rho = 0.018$, $p = 0.946$).

The analysis did not identify a statistically significant association between this item and purchase intention in the current sample. This finding does not establish that economic benefits are unimportant; it indicates that the available data do not provide sufficient evidence of an association.

11.2 H2: Environmental awareness and purchase intention

Environmental friendliness showed a positive correlation with purchase intention ($\rho = 0.308$). However, the association was not statistically significant at the 5% level ($p = 0.246$).

Although the descriptive findings show favourable environmental perceptions, the current analysis does not establish a statistically significant relationship between this individual item and purchase intention.

11.3 H3: Technological reliability and purchase intention

The association between confidence in battery life and reliability and purchase intention was weak ($\rho = 0.067$, $p = 0.806$). It was not statistically significant.

The result should be interpreted cautiously because technological reliability was represented by one survey item, and the sample included only 16 respondents.

11.4 Overall interpretation

None of the three exploratory correlations was statistically significant at $\alpha = 0.05$. Accordingly, the available evidence does not justify rejecting any of the three null hypotheses.

This does not prove that the proposed relationships are absent. The sample size is small, the measures are individual questionnaire items, and the study is exploratory. A larger study using appropriate multi-item measures and a planned sampling design is required for stronger hypothesis testing.

XII. DISCUSSION

The findings present a mixed but informative picture of consumer attitudes towards electric vehicles. Respondents generally recognised environmental benefits and potential savings in transportation costs. However, battery-related concerns and uncertainty about charging accessibility were also evident.

The favourable environmental responses are consistent with the proposition that sustainability can form part of consumer motivation. Nevertheless, the non-significant exploratory correlation between environmental friendliness and purchase intention demonstrates why positive descriptive responses should not automatically be interpreted as evidence of a statistically established relationship.

The perceived economic benefits of EVs were also acknowledged by many respondents. However, consumers may distinguish between lower running costs and the affordability of the initial purchase. A vehicle can be perceived as economical to operate while remaining financially difficult to purchase. Future research should therefore distinguish purchase price, financing, operating expenditure, battery replacement and total cost of ownership.

Battery-related concerns were prominent in both the Likert responses and the single-choice question on adoption challenges. This indicates that consumers may need clearer information about warranties, battery durability, replacement costs and service support. Manufacturers and dealers may benefit from communicating such information transparently.

The findings regarding charging infrastructure also deserve attention. Half of the respondents were neutral about charging accessibility. Neutral responses should not automatically be interpreted as dissatisfaction, but they identify an area where more detailed questioning could clarify consumer experience and information needs.

Regarding category preferences, electric two-wheelers received substantial consideration. However, the present survey did not collect separate ratings of cost, charging convenience, reliability and purchase intention for electric two-wheelers and four-wheelers. As a result, the evidence cannot establish which category is more strongly influenced by any particular factor.

Finally, the exploratory correlations were not statistically significant. Given the small sample, these results should be viewed as inconclusive rather than definitive evidence against the proposed relationships. The study is most useful as a preliminary examination that identifies questions and measures for a stronger follow-up investigation.

XIII. PRACTICAL IMPLICATIONS

13.1 Implications for manufacturers

Manufacturers should provide clear information about battery warranties, expected maintenance, service arrangements and replacement costs. Transparent information may help address uncertainty about long-term ownership.

13.2 Implications for marketers

Marketing communications should combine environmental messages with practical information about affordability, performance, range and suitability for everyday travel. Different consumer groups may require different information depending on their transportation needs.

13.3 Implications for policymakers

Public awareness programmes may help consumers understand vehicle eligibility, applicable incentives and charging options. Improvements in accessible charging infrastructure and reliable consumer information may also support informed decisions.

Any policy recommendations should be supported by further research and official policy documentation rather than inferred solely from this small sample.

13.4 Implications for future researchers

Researchers should use larger samples, clearly document recruitment procedures and measure electric two-wheelers and four-wheelers separately. Multi-

item measures, suitable statistical models and transparent reporting of uncertainty would improve the reliability of subsequent findings.

XIV. LIMITATIONS OF THE STUDY

The study has several limitations.

First, the dataset includes only 16 respondents. The small sample restricts statistical power and limits the generalisability of the findings.

Second, the sampling technique and geographical coverage cannot be established from the supplied response sheet. Consequently, the sample should not be described as nationally representative.

Third, the questionnaire uses individual items to represent economic benefits, environmental awareness and technological reliability. These items do not constitute validated multi-item scales.

Fourth, the questionnaire asks respondents about electric vehicles generally rather than obtaining separate ratings for electric two-wheelers and four-wheelers. This limits the strength of the comparative conclusions.

Fifth, the dependent variable is stated purchase intention rather than observed purchasing behaviour. Actual purchasing decisions may differ from intentions.

Finally, the optional open-ended question described in the proposed questionnaire is absent from the supplied Excel workbook. Qualitative thematic analysis could not therefore be conducted.

These limitations should be addressed in subsequent research before strong comparative or population-level claims are made.

XV. DIRECTIONS FOR FUTURE RESEARCH

Future research should collect data from a larger and more diverse sample of consumers, including current electric vehicle owners, prospective buyers and consumers using conventional vehicles.

The questionnaire should ask respondents to evaluate electric two-wheelers and four-wheelers separately on purchase affordability, operating costs, charging accessibility, driving range, battery reliability, perceived risk, social influence, incentives and purchase intention.

Where respondents evaluate both categories, paired comparisons may be appropriate. Where respondents are assigned to separate category groups, independent-group methods may be considered, subject to the study design and sample size.

Researchers should conduct a pilot study to check the clarity and suitability of the revised questionnaire. Sample size should be determined through an a priori power analysis based on the planned primary statistical test, expected effect size and desired statistical power.

Future studies could also investigate differences by income, age, location, daily travel distance, current vehicle ownership and prior EV experience. An open-ended question could help identify concerns not captured by the structured questionnaire.

XVI. CONCLUSION

This preliminary study examined consumer perceptions, purchase intentions and perceived barriers associated with electric vehicles in India. Among the 160 respondents, 87.5% agreed or strongly agreed that EVs are environmentally friendly, while 75% perceived them as capable of reducing overall transportation costs. At the same time, 75% acknowledged concerns relating to battery replacement, maintenance and resale value.

Eleven respondents (68.8%) indicated that they were likely or very likely to purchase an EV within the next three years. Environmental benefits were the most frequently selected leading purchase factor, while battery life and replacement cost were the most frequently reported adoption challenge.

The exploratory Spearman correlation analysis did not identify statistically significant associations between purchase intention and the three selected perception items. These results should not be interpreted as proof that the relationships do not exist, particularly given the small sample and the use of single-item measures.

The study provides preliminary insights into consumer attitudes and highlights the need to address concerns relating to affordability, battery reliability, driving range and charging accessibility. However, the present evidence does not establish definitive differences between the adoption determinants of electric two-wheelers and four-wheelers.

A larger study using a category-specific questionnaire, a clearly documented sampling procedure and appropriately planned statistical analysis is necessary to establish more reliable comparative findings. Such

research can contribute to a better understanding of consumer decision-making and support evidence-based strategies for electric mobility.

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