

Women's Attitude towards Electric Two-Wheelers: Insights from Theory of Planned Behaviour

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ABSTRACT

This research investigates women's attitudes toward electric two-wheelers using the theory of planned behaviour. The research survey collected 320 valid responses from women customers in Kerala by using structured questionnaires. The researchers utilised SPSS version 26 for analysing descriptive statistics of the respondents and the regression process. The analysis demonstrates perceived behavioural control and social pressure together to adopt electric two-wheelers as the main factors influencing actual user behaviour. The research findings enable policy developers together with manufacturers to create more appealing electric two-wheeler models and foster sustainable transportation in the unexplored segments.

Keywords: Electric two-wheeler, Women's attitude, Theory of planned behaviour, Sustainability

INTRODUCTION

The Indian government prioritises electric mobility as part of its sustainability vision through two-wheeler electric vehicles that serve to combat environmental pollutants and oil-based fuel usage (Nagarkar et al., 2024). NITI Aayog adopts electric vehicles as a top priority because they deliver both environmental and economic benefits in the future (Mittal et al., 2024). The current second phase of the Faster Adoption and Manufacturing of Hybrid & Electric Vehicles (FAME) scheme was launched in 2015 and targets high-speed EV adoption by offering financial support and building essential infrastructure. Indian electric two-wheeler sales recorded a 36% increase in 2023 while surpassing 8 lakh units according to Banerjee (2024). The growth in electric two-wheeler adoption needs further attention because women display significantly less adoption even though their numbers have increased.

The available literature reports different factors that influence electric vehicle adoption which include both affordability concerns and anxiety about operating range and the available charging infrastructure alongside awareness about EV technology. Research exploring the behavioural aspects of electric two-wheelers among women is currently limited. The research utilises the Theory of Planned Behaviour (TPB) (Ajzen, 1991) to examine how women perceive electric two-wheeler adoption through their attitudes and control of behaviour and their social network practices. The research seeks to uncover both stimulating factors and obstacles that will deliver valuable information toward maximizing policy effectiveness as well as market strategy development.

REVIEW OF LITERATURE

Attitude

The adoption decision for electric two-wheelers electric two-wheeler depends significantly on consumer attitude. An individual uses their attitudes to evaluate electric two-wheelers based on their perceived positive and negative aspects (Ajzen, 1991). Research shows that positive perceptions about electric vehicles connect to environmental interests and low costs together with innovative technical development (Rezvani et al., 2018). People avoid adopting electric two-wheelers because they perceive bad performance from the battery as well as long charging times and maintenance expenses (Adu-Gyamfi et al., 2021). The results of gender-based studies demonstrate that women value convenience alongside ease of usage and safety features above technical specifications which shapes their attitude toward electric two-wheelers (Trung & Urmee, 2024).

Social pressure

The choices consumers make regarding their purchases are significantly influenced by social pressures. According to Ajzen (1991), social norms emerge from both family expectations and peer influence along with societal cultural norms which shape the behavioural choices of individuals. Studies have demonstrated that people tend to purchase electric two-wheelers when their friends and family members encourage adoption (Jayasingh et al., 2021). Social influences play a strong role in purchasing behaviour within India since most people's purchasing decisions involve family group discussions and not individual decision-making (Sinha et al., 2002).

Perceived behavioural control

Perceived behavioural control (PBC) encompasses an individual's confidence in their ability to adopt and use electric two-wheelers, influenced by facilitating or obstructing factors (Ajzen, 1991). The PBC of individuals depends heavily on their ability to access charging stations as well as costs and their understanding of electric vehicle technology (Wiejaya & Gularso, 2024). Women face more obstacles in accessing charging facilities and repairing services thus limiting their ability to adopt electric two-wheelers. According to Jayasingh et al. (2021), the adoption rates of electric two-wheelers increase when consumers receive financial incentives and improved infrastructure and training programs.

Intention to adopt

The decision to use electric two-wheelers depends on attitude along with subjective norms and perceived behavioural control according to Ajzen (1991). Research findings show that intention has a significant relationship with actual behaviour since sustainable mobility studies reveal high correlation values (Li et al., 2022). The adoption intention of electric two-wheelers depends on individual values together with environmental understanding and the degree of trust placed in governmental policies (Lin & Dong, 2023). The combination of FAME II scheme incentives and better brand accessibility through the market both enhance buying intentions according to Kohli (2024).

Actual use

The actual use of electric two-wheelers depends on the conversion of intention into behaviour, moderated by external situational factors such as affordability, infrastructure, and policy support (Trung & Urmee, 2024). Studies indicate that even individuals with strong adoption intentions may not proceed due to a lack of charging stations, high upfront costs, or inadequate policy enforcement (Haddadian et al., 2015). Research also highlights the role of post-adoption experiences in sustaining long-term use, emphasizing the need for continuous support services and user-friendly technological advancements (Alka et al., 2024). Gender-specific research suggests that targeted interventions, such as women-friendly financing schemes and awareness programs, can bridge the gap between intention and actual adoption.

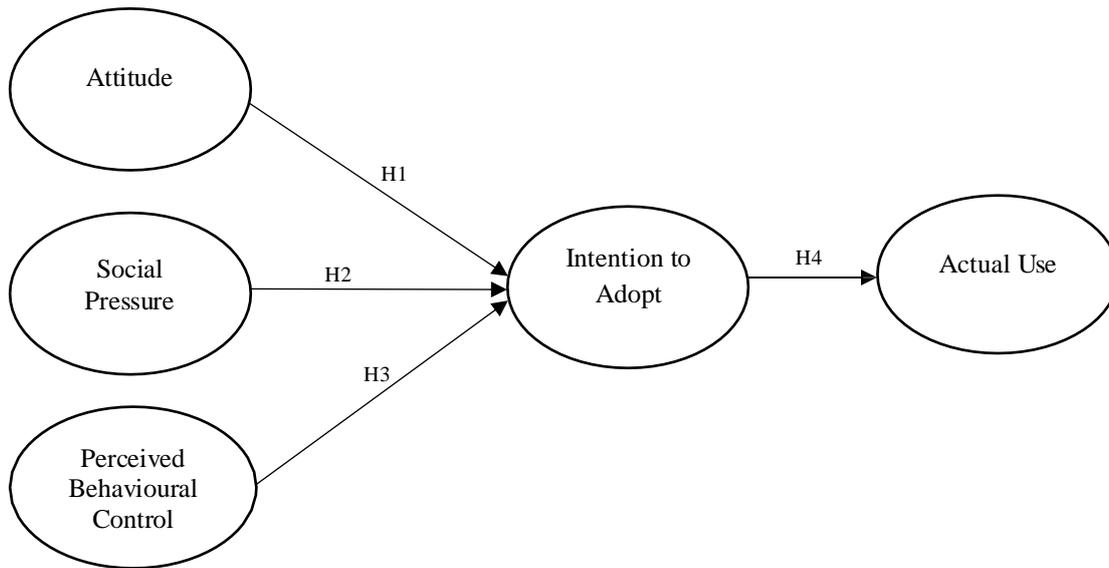


Figure 1. Research Model

HYPOTHESES

The following hypotheses were developed to validate the research model based on the literature review.

- H1: A positive attitude towards electric two-wheelers increases the intention to adopt.
- H2: Social pressure positively influences women's intention to adopt electric two-wheelers.
- H3: Perceived behavioural control positively influences the intention to adopt electric two-wheelers.
- H4: Intention to adopt electric two-wheelers positively influences actual use.

RESEARCH DESIGN

This study adopts a quantitative research design to examine the factors influencing women's adoption of electric two-wheelers. A structured questionnaire was developed, incorporating a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to measure respondents' perceptions. The research model comprises five constructs: Actual Use, Intention to Adopt, Social Pressure, Attitude, and Perceived Behavioral Control with each construct assessed through four items (questions).

Data were collected from a representative sample of women, and descriptive statistics were performed to analyse the demographic characteristics of the respondents. To test the hypothesized relationships, regression analysis was conducted using SPSS 26. The findings provide insights into the key factors influencing women's adoption of electric two-wheelers in the context of sustainable mobility.

SAMPLE DESIGN

This study employed a convenience sampling method to identify and select respondents. The sample consisted of women customers from Kerala, who are existing users of electric two-wheelers. Data were collected using a structured questionnaire, designed to measure key constructs related to adoption behaviour. A total of 320 valid and complete responses were obtained for analysis. The questionnaire items were rated on a five-point Likert scale, reflecting the respondents' level of agreement with each statement. This sampling approach ensured the collection of relevant information while maintaining accessibility and feasibility in data gathering.

RESULTS AND DISCUSSION

DEMOGRAPHIC PROFILE OF RESPONDENTS

The study analyzed responses from 320 women in the Ernakulam district, Kerala, to understand their adoption of electric two-wheelers. Table 1 shows respondents profile represented diverse age groups, with the majority falling in the 18 to 29

years category (29.0%), followed by 40 to 49 years (25.0%), 30 to 39 years (24.7%), and 50 to 59 years (18.4%), while only 2.8% were 60 years and above. In terms of educational qualifications, the largest group held a diploma (30.9%), followed by undergraduate degree holders (29.7%) and postgraduate degree holders (20.6%), while 18.8% had completed high school or below. Regarding monthly income, 32.2% of respondents earned between ₹20,000-40,000, making it the most common income bracket. This was followed by 26.9% in the ₹40,001-60,000 range, 22.5% earning below ₹20,000, and 18.4% earning above ₹60,000. This demographic profile highlights the diversity among the respondents in terms of age, education, and income levels, providing valuable insights into their perceptions and adoption behaviour regarding electric two-wheelers.

Table 1. Respondents profile ($N=320$)

Personal Profile	Frequency	Percentage
Age		
18 to 29	93	29.0
30 to 39	79	24.7
40 to 49	80	25.0
50 to 59	59	18.4
60 and above	9	2.8
Education Qualification		
High school and below	60	18.8
Diploma	99	30.9
Undergraduate degree	95	29.7
Postgraduate degree	66	20.6
Monthly Income		
Below 20000	72	22.5
20000-40000	103	32.2
40001-60000	86	26.9
Above 60000	59	18.4

RELIABILITY ANALYSIS

Reliability is the measure of the internal consistency of the construct in the study. A construct is reliable if the Alpha (α) value is greater than 0.70 (Hair et al., 2013). Construct reliability was assessed using Cronbach's Alpha. The results from Table 2 revealed that the attitude (AT) scale with four items ($\alpha = .809$), the social pressure (SP) scale with four items ($\alpha = .758$) and the perceived behavioural control (PBC) ($\alpha = .757$) were found reliable. Similarly, the intention to adopt (ITA) scale with four items ($\alpha = .769$) and the actual use (AU) scale was also found reliable ($\alpha = .777$).

Table 2. Reliability Results

Constructs	Measurement Items	Cronbach's Alpha (α)	Source
Attitude	I am interested in using electric two-wheelers	0.809	(Kaplan et al., 2016)
	I believe electric two-wheelers would be good for the environment		
	I think electric two-wheelers reduce my travel cost		
	I believe electric two-wheelers are easy to drive		
Social pressure	People who are important to me support my decision to buy an electric two-wheeler	0.758	(Yeğin & Ikram, 2022)
	Social trend influences my purchase decisions		
	People who are important to me appreciate if I buy an electric two-wheeler		

	If I purchased an electric two-wheeler people who are important to me find it as a most desirable decision	
Perceived behavioural control	I believe that I can purchase an electric two-wheeler I have the capacity to buy an electric two-wheeler I have plenty of opportunities to buy an electric two-wheeler Buying an electric two-wheeler is fully within my control	0.757 (Hamzah & Tanwir, 2020)
Intention to adopt	I am interested to buy an electric two-wheeler in the future I intend to buy an electric two-wheeler in the future I am considering buying an electric two-wheeler in the future I plan to buy an electric two-wheeler in the near future	0.769 (Buhmann et al., 2024)
Actual use	Using an electric two-wheeler is an important thing Using an electric two-wheeler is a good idea Using an electric two-wheeler is promoting sustainability Using an electric two-wheeler can reduce pollution	0.777 (Gunawan et al., 2022)

Note: Cronbach's (α), $0.7 \leq \alpha < 0.9$: Good reliability

REGRESSION ANALYSIS

The hypothesis tests whether attitude (AT), social pressure (SP), perceived behavioural control (PBC), and intention to adopt (ITA) significantly impact the actual use (AU) of electric two-wheelers. The dependent variable AU was regressed on the predicting variables AT, SP, PBC, and ITA to test the hypotheses. The model significantly predicted AU, $F(4, 315) = 172.172$, $p < 0.05$, which indicates that the independent variables play a significant role in shaping AU.

The results direct the positive effect of the predictors. Specifically, AT ($\beta = 0.158$, $p = 0.002$), SP ($\beta = 0.156$, $p = 0.011$), PBC ($\beta = 0.340$, $p < 0.05$), and ITA ($\beta = 0.243$, $p < 0.05$) all exhibit significant positive relationships with AU, confirming their influence on adoption behaviour. Moreover, the $R^2 = 0.686$ depicts that the model explains 68.6% of the variance in AU. Table 3 shows the summary of the regression findings.

Table 3. Regression Results

Hypothesis	Beta Coefficient (β)	R^2	F	T-value	P-value	Hypothesis Supported
H1	.158			3.069	.002	Yes
H2	.156			2.542	.011	Yes
H3	.340	.686	172.17	5.913	.000	Yes
H4	.243			4.330	.000	Yes

Note: $P < 0.05$, R^2 values: $0.7 \leq R^2 \leq 0.9$ indicate a strong relationship; $0.5 \leq R^2 < 0.7$ indicate a moderate relationship; and $R^2 < 0.5$ indicate a weak relationship.

CONCLUSION

This research establishes the essential elements that affect women's acceptance of electric two-wheelers by demonstrating how attitude together with social pressure and perceived behavioural control and intention to adopt influence purchase decisions. Actual adoption behaviour receives significant influence from variables analysed through regression analysis, validating the Theory of Planned Behaviour (TPB) for understanding sustainable mobility choices. This research builds knowledge of gender-specific mobility preferences while setting the groundwork for future studies that investigate regional differences and long-term behavioural changes. Future investigations can assess policy intervention effectiveness and emerging technology integration as well as changing consumer perspectives affecting electric two-wheeler adoption.

Creating an inclusive electric mobility system can be achieved through focused efforts on these dimensions to meet its environmental and economic targets.

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