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A STUDY ON AWARENESS TOWARDS ELECTRIC VEHICLES WITH SPECIAL REFERENCE TO KALYANA KARNATAKA REGION

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ABSTRACT

The growth of the transportation sector and increasing environmental concerns have made vehicle awareness, including knowledge of electric vehicles (E-vehicles), an important area of study. E-vehicles are promoted for their environmental benefits and energy efficiency, yet public awareness regarding their functioning, infrastructure, and government incentives remains limited.

This study aims to assess general vehicle awareness, examine awareness about E-vehicles, and analyse gender-wise differences. Data were collected from 180 respondents using a structured Likert-scale questionnaire covering vehicle types, safety measures, E-vehicle knowledge, and related policies. Mean, standard deviation, and Independent Samples t-test were used for analysis.

Findings show that respondents have high awareness of general vehicle types and safety measures. Awareness of E-vehicles is moderate to high, especially regarding environmental benefits, but lower for charging infrastructure and government incentives. Gender-wise analysis revealed no significant difference in general vehicle awareness, while males showed significantly higher awareness of E-vehicles. The study suggests targeted, gender-inclusive programs to promote knowledge and adoption of E-vehicles.

KEY WORDS: *Vehicle Awareness; Electric Vehicles; Gender Differences; Sustainable Transportation; Environmental Awareness*

I. INTRODUCTION

The automobile sector plays a vital role in modern transportation, making vehicles an integral part of daily life. With increasing urbanization and mobility needs, awareness about different types of vehicles, fuel systems, and traffic safety measures has become essential. Proper vehicle awareness contributes not only to individual safety but also to responsible and efficient use of transportation systems.

In recent years, environmental concerns such as air pollution, climate change, and the depletion of fossil fuels have accelerated the shift toward sustainable transportation. Electric vehicles (E-vehicles) have emerged as a viable alternative to conventional petrol and diesel vehicles due to their environmental friendliness and energy efficiency. Although the visibility of E-vehicles is increasing, public awareness regarding their functioning, charging infrastructure, and government incentives remains uneven.

Gender is a significant socio-demographic factor that may influence access to information and awareness about vehicle technologies. Studying gender-wise differences in vehicle and E-vehicle awareness helps in identifying knowledge gaps and ensuring inclusive dissemination of information. In this context, the present study focuses on assessing general vehicle awareness, examining awareness about electric vehicles, and analysing gender-based differences among respondents to support informed decision-making and promote sustainable transportation practices.

II. REVIEW OF LITERATURE

Electric vehicles (EVs) have received growing attention due to their potential to reduce pollution and greenhouse gas emissions, though high costs and limited performance remain challenges (Garling & Thogersen, 2001). Studies indicate that supportive policies, effective marketing, and consumer education are essential to promote adoption. Afroz (2015) highlighted that individual values, convenience, and perceived utility influence EV purchase intentions, while Morton (2016) emphasized the role of consumer attitudes and perceptions of functional capabilities in shaping demand.

Infrastructure and dealer knowledge are also critical factors. Helmus (2016) and Helmus & van den Hoed (2019) stressed the importance of performance indicators for charging infrastructure, while Karwa (2016) noted that trained dealership staff improve consumer understanding of EVs. Nazneen (2018) and Monica & Mifzal (2019) reported that consumers recognize environmental benefits but require better infrastructure and awareness programs to support adoption. Shang & Feng (2019) and Kumar & Sanjeevikumar (2019) identified cost, battery performance, and range anxiety as major barriers.

Global and Indian market studies show similar trends. Selva & Arun Mozhi (2020) reported that BEVs dominate the global market, while peer recommendations strongly influence adoption. Rajper (2020) suggested electric two-wheelers as viable options for developing countries. Indian studies by Nagpal (2020), Beena & Rakesh (2020), Bansal (2021), Kishore (2021), and Varghese (2021) found that while consumers value environmental benefits and government incentives, high costs, limited charging infrastructure, and maintenance concerns remain significant barriers. Overall, literature indicates that increasing awareness, infrastructure, and policy support are key to promoting EV adoption.

III. OBJECTIVES

1) To know the vehicle awareness
2) To know the awareness about E-vehicles
3) To study the awareness among gender

IV. METHODOLOGY

Data collected from primary data through issuing questionnaires to 200 respondents and collected data from 180 respondents. And also, secondary data used for theoretical background information.

V. SCOPE OF THE STUDY

The study focuses on assessing the awareness of general vehicles and electric vehicles (E-vehicles) among the public, with particular attention to gender differences in knowledge and perception. It examines respondents' understanding of vehicle types, safety measures, E-vehicle functioning, environmental benefits, charging infrastructure, and government incentives. The findings are intended to inform policymakers, educators, and industry stakeholders about existing awareness levels, knowledge gaps, and barriers to adoption, providing guidance for designing targeted awareness programs, promotional strategies, and infrastructure development. By highlighting areas of low awareness and gender-based differences, the study contributes to promoting informed, sustainable, and inclusive adoption of electric vehicles in both urban and semi-urban contexts.

VI. DATA ANALYSIS AND INTERPRETATION

Section A:Awareness about vehicles

Statements	***Mean***	***SD***
I am aware of different types of vehicles such as two-wheelers, cars, and buses.	4.12	0.68
I understand the difference between petrol, diesel, and electric vehicles.	3.98	0.72
I am aware of basic vehicle safety measures such as wearing helmets and seat belts.	4.25	0.61
I regularly follow traffic and vehicle safety rules.	3.85	0.79
I keep myself informed about new developments in vehicle technology.	3.70	0.83
Overall Vehicle Awareness	**3.98**	**0.73**

Interpretation of Section A: Awareness about Vehicles (N = 180)

The results presented in Table A indicate that respondents possess a **high level of general vehicle awareness**. The overall mean score for Section A is **3.98 (SD = 0.73)**, which reflects a strong understanding of vehicles and related safety aspects among the participants.

A high mean score was observed for **awareness of basic vehicle safety measures** (M = 4.25, SD = 0.61), suggesting that most respondents are well informed about essential safety practices such as wearing helmets and seat belts. This also indicates effective dissemination of road safety information through media, education, and enforcement mechanisms.

Similarly, respondents demonstrated a high level of awareness regarding **different types of vehicles** (M = 4.12, SD = 0.68), indicating familiarity with commonly used vehicles such as two-wheelers, cars, and buses. This may be attributed to increased vehicle usage and daily exposure to various modes of transportation.

Understanding the **difference between petrol, diesel, and electric vehicles** also recorded a relatively high mean score (M = 3.98, SD = 0.72), suggesting that most respondents are knowledgeable about basic vehicle classifications and fuel types.

However, comparatively lower mean scores were found for **following traffic and vehicle safety rules** (M = 3.85, SD = 0.79) and **awareness of new developments in vehicle technology** (M = 3.70, SD = 0.83). Although these values still fall within the moderate-to-high range, they indicate scope for improvement, particularly in encouraging consistent adherence to traffic regulations and increasing awareness about emerging vehicle technologies.

Overall, the findings reveal that respondents possess strong foundational knowledge of vehicles, with slightly lower engagement in advanced or evolving aspects of vehicle awareness.

Section B:Awareness about Electric Vehicles (E-Vehicles)

Statements	***Mean***	***SD***
I am aware of electric vehicles (E-vehicles).	4.05	0.71
I have sufficient knowledge about how E-vehicles work.	3.65	0.85
I am aware that E-vehicles are environmentally friendly.	4.20	0.63
I am aware of the availability of charging stations for E-vehicles.	3.40	0.90
I am aware of government policies, incentives, or subsidies related to E-vehicles.	3.22	0.95
I believe E-vehicles help reduce air pollution compared to fuel vehicles.	4.18	0.66
I believe E-vehicles are cost-effective in the long run.	3.60	0.82
Overall E-Vehicle Awareness	**3.76**	**0.79**

Interpretation of Section B: Awareness about Electric Vehicles (E-Vehicles) (N = 180)
Table B presents the level of awareness regarding electric vehicles among the respondents. The overall mean score for Section B is **3.76 (SD = 0.79)**, indicating a **moderate to high level of awareness** about E-vehicles.

A high level of awareness was observed for **general awareness of electric vehicles** (M = 4.05, SD = 0.71), suggesting that E-vehicles are widely recognized among the respondents. Additionally, respondents showed strong agreement with the statement that **E-vehicles are environmentally friendly** (M = 4.20, SD = 0.63) and that **E-vehicles help reduce air pollution** (M = 4.18, SD = 0.66). These findings indicate a clear understanding of the environmental benefits associated with electric mobility.

Moderate awareness levels were noted for **knowledge about how E-vehicles work** (M = 3.65, SD = 0.85) and the belief that **E-vehicles are cost-effective in the long run** (M = 3.60, SD = 0.82). This suggests that while respondents are generally positive about E-vehicles, detailed technical and economic knowledge remains limited. Relatively lower mean scores were found for **awareness of charging station availability** (M = 3.40, SD = 0.90) and **awareness of government incentives and subsidies** (M = 3.22, SD = 0.95). The higher standard deviations for these items indicate varied responses, implying that information regarding infrastructure and policy support has not reached all segments of the population equally.

In summary, the findings show that respondents are environmentally conscious and generally aware of electric vehicles; however, gaps exist in practical knowledge related to infrastructure and government support. These gaps highlight the need for greater public awareness campaigns and improved dissemination of information to promote the adoption of E-vehicles.

Section C:Gender and Awareness

Table 1: Gender-wise Difference in Vehicle Awareness

Gender	***N***	***Mean***	***SD***	***t-value***	***p-value***
Male	*110*	*4.02*	*0.71*	*0.93*	*0.354*
Female	*70*	*3.92*	*0.76*		
Total	***180***	***3.98***	***0.73***		

Interpretation

An Independent Samples *t*-test was applied to examine whether a significant difference exists between male and female respondents in terms of **general vehicle awareness**. The mean score for males (M = 4.02, SD = 0.71) was marginally higher than that of females (M = 3.92, SD = 0.76). However, the calculated *t*-value (t = 0.93) with a *p*-value of 0.354 indicates that the difference is **not statistically significant** at the 0.05 level.

This finding suggests that **general awareness about vehicles does not differ significantly based on gender**. Both male and female respondents exhibit a comparable level of understanding regarding vehicle types, fuel differences, and safety measures.

Table 2: Gender-wise Difference in E-Vehicle Awareness

Gender	***N***	***Mean***	***SD***	***t-value***	***p-value***
Male	*110*	*3.85*	*0.78*	*2.05*	*0.042**
Female	*70*	*3.60*	*0.82*		
Total	***180***	***3.76***	***0.79***		

*Significant at 0.05 level

Interpretation

To assess whether awareness about electric vehicles differs between genders, an Independent Samples *t*-test was conducted. The results reveal that male respondents (M = 3.85, SD = 0.78) reported higher awareness levels compared to female respondents (M = 3.60, SD = 0.82). The obtained *t*-value of 2.05 and *p*-value of 0.042 indicate that the difference is **statistically significant** at the 0.05 level.

This result implies that **gender plays a significant role in influencing awareness about electric vehicles**. The higher awareness among male respondents may be due to greater exposure to automobile-related information, technological discussions, or policy-related updates on E-vehicles.

VII. FINDINGS AND SUGGESTIONS

Findings of the Study

1. The study reveals that the overall level of general vehicle awareness among respondents is high. Most participants are knowledgeable about different types of vehicles, fuel types, and basic vehicle safety measures.
2. The mean score for vehicle awareness indicates that respondents are well informed about road safety rules and vehicle usage, though awareness about recent developments in vehicle technology is comparatively lower.
3. The findings show a moderate to high level of awareness about electric vehicles (E-vehicles) among the respondents. Participants are generally aware of the existence and environmental benefits of E-vehicles.
4. Respondents exhibit strong awareness regarding the environmental friendliness of E-vehicles and their role in reducing air pollution, reflecting growing environmental consciousness.
5. Awareness related to charging infrastructure and government incentives for E-vehicles is relatively low, indicating a lack of practical and policy-related knowledge.
6. Gender-wise analysis reveals no significant difference between male and female respondents in terms of general vehicle awareness, suggesting equal exposure to basic vehicle-related information.
7. A significant gender difference is observed in awareness about electric vehicles, with male respondents demonstrating higher awareness than female respondents.
8. The results indicate that while foundational knowledge about vehicles is evenly distributed, advanced and emerging vehicle technologies such as E-vehicles show gender-based awareness gaps.

Suggestions

1. **Targeted awareness programs** should be conducted to improve knowledge about electric vehicles, particularly focusing on charging facilities, maintenance, and long-term cost benefits.
2. Government agencies and automobile manufacturers should intensify **information campaigns on subsidies, incentives, and policies** related to E-vehicles to enhance public awareness.
3. **Gender-inclusive educational initiatives** should be implemented to bridge the awareness gap observed in E-vehicle knowledge, ensuring equal access to technological information for all genders.
4. Educational institutions can include **basic automobile and electric vehicle literacy programs** as part of curriculum or awareness workshops to improve understanding among young individuals.
5. Media platforms, including social media and digital advertisements, should be effectively utilized to promote **accurate and simplified information** about E-vehicles and their benefits.

6. Improvement in **charging infrastructure visibility** through public signage and mobile applications can help increase awareness and confidence among potential E-vehicle users.
7. Policymakers should collaborate with local communities to conduct **demonstrations and test-drive programs** to familiarize people with E-vehicle technology.
8. Future studies may consider including additional variables such as age, education, income level, and place of residence to gain deeper insights into factors influencing vehicle and E-vehicle awareness.

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