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Exploring Factors Driving Consumer's Purchase Intention Towards Electric Two-Wheelers

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Abstract

This study investigates the consumer purchase intentions towards electric two-wheelers in Kathmandu Valley. The research examines the roles of environmental concerns, perceived economic benefits, social influence, and charging infrastructure. Data were collected from 400 respondents through a structured questionnaire survey, and hierarchical multiple regression was used for the causal analysis. Results indicate that environmental concerns are a strong motivator for adopting e-bikes, highlighting the potential for leveraging environmental benefits in marketing strategies. Perceived economic benefits also play a crucial role, suggesting that financial incentives could enhance e-bike appeal. Social influence emerged as a powerful factor, indicating that endorsements from peers and social networks can significantly shape purchase intentions. Despite these positive influences, high initial costs and inadequate charging infrastructure remain significant barriers. The study suggests that addressing these barriers through targeted interventions such as subsidies, improved charging infrastructure, and public awareness campaigns, is essential for promoting e-bike adoption. The findings provide valuable insights for policymakers and industry stakeholders to design strategies that support the transition to sustainable transportation, contributing to a cleaner environment and improved public health in Kathmandu Valley.

Keywords: electric two-wheelers, consumer purchase intention, environmental concerns, perceived economic benefits, charging infrastructure

Introduction

Large cities in developing countries face a significant challenge with air pollution primarily caused by emissions from traditional fuel-based vehicles. Studies have shown a correlation between these emissions and respiratory illnesses, highlighting the significant threat this pollution poses to public health. Addressing environmental sustainability is a key target within the SDGs, as climate change and ecological degradation continue to

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impact ecosystems globally (United Nation, 2023). Policymakers are actively pursuing strategies that promote sustainable development and reduce carbon emissions. Electric two-wheelers (e-bikes) have emerged as a promising option in this pursuit of clean and efficient transportation. E-bikes offer several advantages over traditional fossil fuel-powered vehicles. Firstly, they produce zero tailpipe emissions, significantly reducing air pollution and its negative consequences for public health (IEA, 2023). Secondly, e-bikes boast superior energy efficiency compared to traditional scooters and motorcycles, translating to reduced reliance on fossil fuels and contributing to a more sustainable transportation system while mitigating environmental impact. Lastly, e-bikes offer lower operating costs in the long run due to reduced fuel and maintenance requirements compared to traditional vehicles.

Despite the recognized environmental and economic benefits of electric two-wheelers, their adoption in Nepal remains significantly lower than anticipated. This low adoption rate is particularly concerning in a region where air pollution from traditional fuel-based vehicles poses a severe public health threat (Pandey & Shrestha, 2021). Studies have identified several barriers to the widespread adoption of e-bikes, including high upfront costs, inadequate charging infrastructure, and limited public awareness. However, these studies often fail to consider the causal relationship of such factors in adoption of e-bikes within a unique socio-economic cultural context like in Kathmandu. This gap in understanding how these barriers interact within the specific context creates the need for this research which might help develop effective strategies for promoting e-bikes.

Moreover, existing research on e-bike adoption in Nepal has largely focused on broad technological and economic factors, neglecting the specific challenges and consumer perceptions unique to Kathmandu Valley. This oversight limits the effectiveness of proposed solutions, which may not be fully applicable to the region's rapidly growing urban population and inadequate infrastructure (Murugan & Marisamynathan, 2023). Additionally, the socio-cultural dynamics that significantly influence consumer behavior in Kathmandu are often overlooked (Karki et al., 2023). Addressing these gaps is crucial for enhancing the understanding of e-bike adoption in Kathmandu and providing policymakers with the insights needed to design targeted interventions. Hence, this research aims to fill these gaps by examining the specific purchase intention of e-bike in Kathmandu Valley, thereby contributing to a more sustainable transportation future for the region.

Integrating the TPB framework provides valuable insights for designing effective interventions that encourage the widespread adoption of e-bikes, contributing to a cleaner and more sustainable transportation future for Kathmandu (Ajzen, 2020).

Despite these compelling benefits, the widespread adoption of e-bikes in Kathmandu Valley remains limited. Several factors might be hindering their wider acceptance. One potential barrier is limited public awareness. While awareness of e-bikes is on the rise, some potential consumers might still lack knowledge about the specific benefits and functionalities that e-bikes offer. Another hurdle could be the higher upfront cost of e-bikes compared to traditional two-wheelers. While e-bikes offer significant cost savings in the long term due to lower fuel and maintenance needs, the initial purchase price might be a deterrent for some consumers. Finally, the lack of widespread charging infrastructure in Kathmandu Valley presents a major challenge. Potential e-bike buyers might experience "range anxiety," fearing they won't be able to find a charging point when needed, hindering their willingness to adopt this new technology. Understanding these factors is crucial for policymakers and industry stakeholders to develop strategies that promote e-bike adoption and pave the way for cleaner air, improved public health, and a greener future for Kathmandu Valley. Existing academic studies tend to focus on the potential for e-bike adoption rather than established use cases. The gap in knowledge regarding existing e-bike usage in Kathmandu Valley underscores the need for further research. Building on this foundation, this research seeks to explore the impact of environmental concerns, economic benefits, charging access, and social influences on the e-bike purchase intentions in Kathmandu Valley.

Literature Review

The increasing emphasis on sustainable transportation, driven by global climate change mitigation efforts (Singh, 2023), has directed attention towards the factors influencing consumer adoption of electric vehicles (EVs). Much of the existing literature has explored how consumer perceptions and technological acceptance models shape decisions around adopting sustainable mobility solutions (Adhikari & Shakya, 2021). Studies in neighboring countries, such as India, have shown the potential of electric two-wheelers (e-bikes) as a sustainable alternative to traditional modes of transport. These studies often focus on perceived usefulness, ease of use, and social influence as pivotal factors in shaping consumer behavior (Murugan & Marisamynathan, 2023). Moreover, studies in India by Shetty and Rizwana (2024) and in China by Xue (2024) have successfully employed frameworks such as the Unified Theory of Acceptance and Use of Technology and Innovation Resistance Theory to model consumer behavior, such models have not been fully adapted to Nepal’s context.

The existing literature highlights several factors, including infrastructure challenges, social influence, and government incentives, as critical to the adoption of E-TWs (Pandey & Shrestha, 2021). Research by Shakya et al. (2024) and Karki et al. (2023)

briefly addressed consumer interest in e-bikes and electric scooters in Kathmandu, focusing on the impact of high costs, lack of charging infrastructure, and social influence. Despite this progress, Nepalese context especially in relation to e-bikes, remains relatively unexplored in the academic discourse. The gap lies in the lack of comprehensive, empirical research that not only applies established consumer behavior models to the Nepali market but also explores additional variables such as environmental awareness, governmental policies, and the influence of regional disparities. Building on this background and insights from relevant literature, four hypotheses have been formulated as follows.

Environmental Concern and EV Purchase Intentions. Environmental concern reflects consumers' awareness of sustainability. Studies in sustainable transportation consistently show that individuals with greater concern for environmental issues are more likely to adopt green technologies like electric vehicles. The Theory of Planned Behavior (TPB) supports this, suggesting that environmental concern strongly influences pro-environmental behaviors, such as the purchase of e-bikes (Ajzen, 1991). Yeğin and Ikram (2022) extended the TPB by incorporating factors like environmental concern and green trust, demonstrating their significant effect on purchase intentions. Hence, first hypothesis of this study is:

H1: *Environmental concern positively influences the purchase intention of electric two-wheelers in Kathmandu Valley.*

Economic Benefit and EV Purchase Intentions. Perceived economic benefits focuses on the financial advantages of e-bikes over traditional vehicles. It is a key factor in shaping consumer behavior, especially in cost-sensitive markets. The financial advantages of e-bikes, including lower operating and maintenance costs (Khurana, 2019) and long-term cost savings compared to traditional vehicles (Shakya et al., 2024) serve as significant motivators for purchase intentions. Thus, the second hypothesis of the study is:

H2: *Perceived economic benefit positively influences the purchase intention of electric two-wheelers in Kathmandu Valley.*

Charging Infrastructure and EV Purchase Intentions. Charging infrastructure emphasizes the need for accessible charging stations to reduce range anxiety. The availability of robust charging infrastructure has been shown to significantly influence consumers' willingness to purchase electric vehicles, including e-bikes. Xue's (2024) study on electric vehicle adoption in China emphasizes that inadequate charging infrastructure is a major barrier to purchase intentions, reinforcing the idea that charging

availability plays a key role in shaping consumer decisions. Thus, this study hypothesizes that:

H3: *Charging infrastructure positively influences the purchase intention of electric two-wheelers in Kathmandu Valley.*

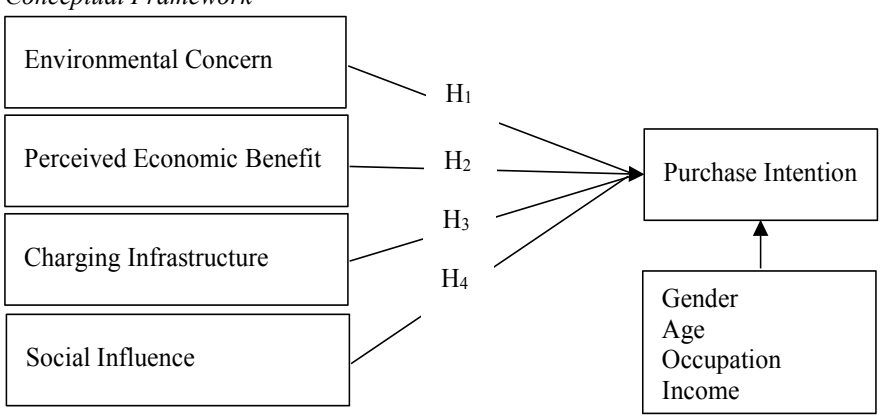
Social influence and EV purchase intentions. Social influence considers how societal norms, peer pressure, and social networks affect individual's purchasing decisions. In the context of e-bike adoption, this influence may come from endorsements by friends, family, or influential figures, which can shape consumer attitudes. However, Shetty and Rizwana's (2024) study on electric two-wheeler adoption in India found that social influence did not significantly affect purchase intention, suggesting that factors like performance and cost might be more critical. Therefore, the fourth hypothesis is:

H4: *Social influence positively affects the purchase intention of electric two-wheelers in Kathmandu Valley.*

Accordingly, the relationship between the study variables is presented in Figure 1.

Figure 1

Conceptual Framework



Source. Jayasingh et al. (2021) and Shandilya and Skotte (2021)

Method

A quantitative survey design was employed to gather data from a large, representative sample, enabling conclusions about potential e-bike users. The questionnaire captures demographic information, e-bike usage patterns, factors affecting e-bike purchases, and purchase intention of consumers. The target population includes all adult residents of Kathmandu Valley, categorized by gender, age, occupation, and, income. A sample size

of 400 ensures robust statistical analysis and reliable results (Hair et al., 2010). Data were collected through a structured questionnaire distributed via Google Forms, targeting university campuses, downtown market areas, motorcycle showrooms, and residential neighborhoods. The questionnaire assesses environmental concern, perceived economic benefit, social influence, and charging infrastructure, with the purchase intention for e-bikes as the dependent variable.

Data analysis involves descriptive and inferential statistics. Descriptive statistics summarize the information collected, using frequency tables, means, and standard deviations to illustrate response distributions. Inferential statistics, including correlation and hierarchical multiple regression were used to test hypotheses formulated in this study. Reliability analysis, using Cronbach's Alpha, assesses the internal consistency and reliability of the survey items, ensuring the robustness of the findings (Taber, 2018).

Results

Table 1 presents a comprehensive overview of the demographic characteristics and e-bike usage patterns among respondents in Kathmandu Valley. In terms of gender distribution, the majority of respondents (64.5%) are male. This suggests a higher interest or accessibility of e-bikes among men in the region. Age distribution shows a significant concentration in the younger demographics, with 31.3% of respondents aged 18-24 and a notable 57.5% aged 25-34. This indicates that e-bikes are particularly popular among younger adults, likely due to their tech-savviness and environmental consciousness.

Occupation-wise, a substantial i.e. 55% of respondents are employed full-time, reflecting a stable income base that might facilitate the purchase of e-bikes. Students constitute 29% of the respondents, highlighting a significant segment that may benefit from the cost-efficiency and convenience of e-bikes for daily commutes. Self-employed individuals make up 11%, while part-time employees account for 5%, suggesting diverse economic backgrounds among users. Income levels among respondents show a varied distribution. The highest proportion (21%) falls within the NPR 30,000 - NPR 40,000 bracket, followed closely by those earning less than NPR 20,000 (18%) and those earning above NPR 50,000 (18.5%).

The duration of e-bike usage reveals interesting trends. A significant 64.3% of respondents have not used any e-bike yet, indicating a large untapped market. Among current users, 13.8% have used e-bikes for less than a month, suggesting a growing curiosity and trial phase among new users. Those with more than two years of usage account for 7.5%, reflecting a smaller but stable user base.

Table 1

Demographic Profile of Respondents

Dimension and Group	*N*	Percent	Dimension and Group	*N*	Percent
Gender			Used duration		
Female	142	35.5	1-2 years	11	2.8
Male	258	64.5	1-3 months	22	5.5
Age			4-6 months	11	2.8
18-24	125	31.3	7-12 months	14	3.5
25-34	230	57.5	Less than 1 month	55	13.8
35-44	32	8	More than 2 years	30	7.5
45-54	9	2.3	Not used yet	257	64.3
55 and above	4	1	Used E-bike		
Occupation			Cargo e-bike	4	1
Employed (Full-Time)	220	55	Commuter e-bike	40	10
Employed (Part-Time)	20	5	Folding e-bike	10	2.5
Self-Employed	44	11	Mountain e-bike	24	6
Student	116	29	Road e-bike	119	29.8
Income			Other	203	50.8
No response	20	5			
Above NPR 50,000	74	18.5			
Less than NPR 20,000	72	18			
NPR 20,000 - NPR 30,000	80	20			
NPR 30,000 - NPR 40,000	84	21			
NPR 40,000 - NPR 50,000	70	17.5			

Note. $N = 400$

Regarding the types of e-bikes used, 29.8% prefer road e-bikes, while 10% use commuter e-bikes, and 6% opted for mountain e-bikes. Interestingly, a substantial 50.8% fall under the 'Other' category, indicating diverse preferences and possibly custom or hybrid models in use.

The mean scores for the overall variables (Table 2) indicate generally positive perceptions and intentions regarding electric two-wheelers. Environmental concerns (mean = 3.6645) and charging infrastructure (mean = 3.6470) are particularly high, underscoring the importance of eco-friendliness and adequate charging facilities. These high scores suggest that respondents are motivated by environmental considerations and the need for robust charging infrastructure to support their potential switch to electric vehicles.

Table 2

Descriptive Statistics of Variables

Variables	Mean	Std. Deviation
PEB	3.517	0.71202
EC	3.6645	0.80171
SI	3.3895	0.78328
CI	3.647	0.71755
PUIN	3.5735	0.75871

Further, perceived economic benefits (mean = 3.5170) and purchase intention (mean = 3.5735) are also strong, suggesting that respondents see financial advantages and are inclined towards purchasing e-bikes. The relatively lower score for Social Influence (mean = 3.3895) indicates that while social factors do play a role, they may not be as influential as economic or environmental concerns. This highlights the need for comprehensive strategies that address practical benefits and social acceptance to foster greater adoption of electric two-wheelers.

Table 3

Correlation Matrix

	PEB	EC	SI	CI	PUIN
PEB	1				
EC	.818**	1			
SI	.654**	.693**	1		
CI	.598**	.590**	.556**	1	
PUIN	.726**	.747**	.733**	.591**	1

**. Correlation is significant at the 0.01 level (2-tailed).

The Pearson correlation coefficients reveal strong positive relationships among all variables, with significance levels indicating that these correlations are statistically significant at the 0.01 level (2-tailed). The strongest correlation with Purchase Intention (PUIN) is with Environmental Concerns (EC) at .747, indicating that respondents who are more concerned about environmental issues are more likely to intend to purchase electric two-wheelers. This high correlation underscores the importance of environmental awareness in promoting e-bikes.

Social Influence (SI) shows a strong positive correlation with PUIN at .733. This suggests that social factors, such as the influence of peers and societal norms, significantly impact individuals' decisions to purchase e-bikes. This implies that

marketing strategies should leverage social proof and peer endorsements to boost e-bike adoption.

Perceived Economic Benefits (PEB) also correlates strongly with PUIN at .726, highlighting that financial considerations, including cost savings and economic incentives, play a crucial role in purchase intentions. It suggests that emphasizing the long-term economic benefits of e-bikes could effectively increase their appeal.

Charging Infrastructure (CI) has the lowest but still significant correlation with PUIN at .591. This indicates that while infrastructure is a critical factor, it may not be as immediately influential as economic benefits, social influence, or environmental concerns. However, the significance of CI cannot be understated, as adequate and accessible charging infrastructure is essential to support the practical use of e-bikes.

The high inter-correlations between PEB, EC, SI, and CI also suggest that these factors are not isolated but interrelated. For instance, individuals who perceive strong economic benefits from e-bikes are also likely to have high environmental concerns and be influenced by social factors. Understanding these interrelationships can help in designing comprehensive strategies that address dimensions of consumer motives simultaneously.

The model summary (Table 4) presents the fit statistics for two regression models that explain the variation in purchase intention. Model 1 includes only demographic predictors: gender, age, and occupation. This model has an R Square of 0.030, indicating that these factors explain just 3% of the variance in PUIN. The Adjusted R Square, which adjusts for the number of predictors, is slightly lower at 0.023, suggesting that demographic factors alone provide a minimal explanation for purchase intentions. The R Square Change, also 0.030, indicates the amount of variance explained by adding these predictors to a model with no predictors. The F Change value of 4.073, with a significance level of $p = 0.007$, shows that the model is statistically significant, but its explanatory power is weak.

Table 4

Model Summary

			Change Statistics				p-values F
Model	R^2	Adjusted R^2	R^2 Change	F Change	df1	df2	F Change
1	.030	.023	.030	4.073	3	396	.007
2	.684	.678	.654	202.433	4	392	.0001

Model 2 has more variables: Environmental Concerns (EC), Social Influence (SI), Perceived Economic Benefits (PEB), and Charging Infrastructure (CI). This model dramatically improves the explanatory power, with an R Square of 0.684, indicating that

68.4% of the variance in PUIN is explained by these combined factors. The Adjusted R Square of 0.678 confirms the robustness of this model even after accounting for the number of predictors. The R Square Change of 0.654 shows a substantial increase in explained variance with the addition of the new variables. The F Change value of 202.433, with a significance level of p = 0.0001, indicates a highly significant model, suggesting that these added predictors are critical in explaining purchase intentions. The ANOVA (Table 5) assesses the overall significance of the regression models by comparing the model fit with a model that has no predictors.

Table 5

ANOVA

Model		Sum of Squares	df	Mean Square	F-statistics	p-values
1	Regression	6.875	3	2.292	4.073	.007
	Residual	222.805	396	.563		
	Total	229.679	399			
2	Regression	157.001	7	22.429	120.973	.000
	Residual	72.678	392	.185		
	Total	229.679	399			

In Model 1, the regression sum of squares (6.875) reflects the variance in PUIN explained by the predictors gender, age, and occupation. The mean square for the regression (2.292) is derived by dividing the regression sum of squares by the number of predictors plus one (degrees of freedom for the regression). The F value for Model 1 is 4.073, with a significance level (p-value) of 0.007. This indicates that the model is statistically significant, meaning the predictors collectively have a non-random effect on PUIN. However, the low sum of squares suggests that these predictors explain only a small portion of the total variance in purchase intentions.

Model 2 shows a significant improvement, the regression sum of squares dramatically increases to 157.001, indicating that the new predictors (Environmental Concerns - EC, Social Influence - SI, Perceived Economic Benefits - PEB, and Charging Infrastructure - CI) contribute significantly to explaining the variance in PUIN. The mean square for the regression is 22.429, and the F value is an impressive 120.973, with a p-value of 0.000. This highly significant F value indicates that the model fits the data much better than Model 1. The residual sum of squares (72.678) is much lower than in Model 1, showing that less variance in PUIN is left unexplained. The substantial reduction in residuals underscores the effectiveness of the added predictors in capturing the consumer purchase intentions towards e-bikes. Additionally, the regression result taking purchase intention as the criterion variable is presented in Table 6.

Table 6

Coefficients of Regression Model

Model		Unstandardized B	SE	Standardized Beta	T-statistics	p-values	Collinearity Statistics Tolerance	VIF
1	(Constant)	4.015	.168		23.878	.000		
	Gender	-.027	.078	-.017	-.347	.728	.997	1.003
	Age	-.040	.055	-.039	-.727	.467	.836	1.196
	Occupation	-.177	.062	-.153	-2.829	.005	.834	1.198
2	(Constant)	.191	.171		1.116	.265		
	Gender	.118	.046	.074	2.575	.010	.971	1.030
	Age	.024	.033	.024	.736	.462	.783	1.277
	Occupation	-.072	.037	-.063	-1.977	.049	.796	1.257
	PEB	.260	.056	.244	4.637	.000	.292	3.428
	EC	.239	.051	.252	4.699	.000	.280	3.571
	SI	.323	.041	.333	7.893	.000	.453	2.209
	CI	.118	.040	.112	2.931	.004	.554	1.805

In Model 1, the constant coefficient is 4.015, representing the baseline PUIN when all other predictors (gender, age, and occupation) are zero. The unstandardized coefficient for Gender is -0.027, with a t-value of -0.347 and a p-value of 0.728. This indicates that Gender has a negative but statistically insignificant effect on PUIN, suggesting no meaningful difference in purchase intention between males and females in this model. The unstandardized coefficient for Age is -0.040, with a t-value of -0.727 and a p-value of 0.467, indicating that Age also has no significant impact on PUIN in this context. However, Occupation shows a significant negative effect with an unstandardized coefficient of -0.177, a t-value of -2.829, and a p-value of 0.005. This implies that certain occupations negatively influence the intention to purchase e-bikes, possibly due to associated financial constraints or differing lifestyle priorities.

In Model 2, additional predictors provide a more comprehensive understanding of the Purchase Intention (PUIN). The constant coefficient is reduced to 0.191, indicating the baseline PUIN after including these predictors. The Gender coefficient turns positive at 0.118, with a t-value of 2.575 and a p-value of 0.010, indicating that males are more likely to intend to purchase e-bikes compared to females. The coefficient for Age remains positive but non-significant ($\beta = 0.024$, $t = 0.736$, $p = 0.462$), suggesting that Age does not significantly influence purchase intentions.

Occupation has a smaller negative effect with a coefficient of -0.072, a t-value of -1.977, and a p-value of 0.049, indicating a significant impact, though less strong than in Model 1. Perceived Economic Benefits (PEB) have a significant positive impact ($\beta = 0.260$, $t = 4.637$, $p = 0.000$), indicating that economic benefits enhance purchase intentions.

Environmental Concerns (EC) also positively influence PUIN ($\beta = 0.239$, $t = 4.699$, $p = 0.000$), highlighting environmental awareness as a key motivator.

Social Influence (SI) is the strongest predictor ($\beta = 0.323$, $t = 7.893$, $p = 0.000$), emphasizing the role of social norms and peer influence. Charging Infrastructure (CI) has a positive impact ($\beta = 0.118$, $t = 2.931$, $p = 0.004$), indicating the importance of available charging stations. The collinearity statistics show no multicollinearity issues, with all VIF values below 4, reinforcing the robustness of the model.

Demographic factors; gender, age, and occupation impact purchase intentions towards e-bikes, but the inclusion of environmental concerns, perceived economic benefits, social influence, and charging infrastructure significantly enhances the model's explanatory power. These findings underscore the importance of these factors, providing actionable insights for promoting e-bike adoption in Kathmandu Valley.

Discussion

The findings of this research provide significant insights into the consumer purchase intentions for electric two-wheelers (e-bikes) in Kathmandu Valley. This study notes a slightly lower impact of charging infrastructure compared to other studies but emphasizes the role of perceived economic benefits more strongly. This alignment with research by Jayasingh et al. (2021) and Shakya et al. (2024) underscores the robustness and relevance of our findings. These findings align with existing literature, affirming the significant influence of these factors on e-bike adoption.

The results align with Adhikari and Shakya (2021) which emphasized on perceived ease of use and usefulness, which our study also identifies as significant motivators for e-bike adoption. Similarly, Murugan and Marisamynathan (2023) highlighted the convenience, low maintenance, and speed as influential factors, while identifying high initial costs and inadequate charging infrastructure as significant barriers. These findings resonate with our results, underscoring the need for substantial investment in charging infrastructure and financial incentives.

Shetty and Rizwana (2024) underscored performance expectancy, price value, and hedonic motivation as key drivers of electric two-wheeler adoption in India, with government support playing a critical role. Likely, this study found perceived economic benefits and social influence as significant determinants of purchase intentions, suggesting that interventions (subsidies, public awareness campaigns etc.) are essential.

Xue (2024) identified significant functional and psychological barriers to EV adoption in China, particularly concerns about charging infrastructure and perceived range

limitations. In the same line, findings of this study emphasized the importance of robust governmental policies to address practical consumer concerns.

Shakya et al. (2024) highlighted the lack of charging infrastructure and high costs as major barriers in Kathmandu, despite high awareness and interest in e-bikes. This aligns with our findings that environmental concerns and perceived economic benefits are strong motivators, but infrastructure and cost issues must be addressed. Additionally, in line with the finding of Karki et al. (2024), this study confirms social influence as a strong predictor of purchase intentions. Leveraging social networks and endorsements can effectively increase market penetration. Addressing these barriers and leveraging identified motivators can significantly enhance e-bike adoption, contributing to a more sustainable and environment friendly means of transportation in Kathmandu Valley.

Conclusion

Findings of this study indicated that environmental concerns are a significant motivator for adopting e-bikes. Consumers are driven by the desire to reduce air pollution and contribute to environmental conservation. Additionally, perceived economic benefits, such as lower operational costs and maintenance expenses, play a crucial role in encouraging e-bike purchases. Financial incentives and economic savings are strong determinants that can enhance the appeal of e-bikes.

Social influence emerged as another powerful factor, suggesting that endorsements from peers and social networks significantly shape consumer attitudes towards e-bikes. Leveraging social proof and positive endorsements can effectively increase market penetration. However, high initial costs and inadequate charging infrastructure remain substantial barriers to e-bike adoption. These challenges need to be addressed through targeted interventions, such as subsidies, improved charging infrastructure, and public awareness campaigns.

The analysis showed significant differences in purchase intentions across various age and occupational groups, with older individuals and part-time employees displaying higher intentions to adopt e-bikes. These insights underscore the need for targeted interventions, such as enhancing charging infrastructure, providing financial incentives, and leveraging social influence, to effectively promote e-bike adoption in Kathmandu Valley and contribute to sustainable transportation solutions.

The study provides valuable insights for policymakers and industry stakeholders. By understanding and addressing the identified barriers and leveraging the motivators, strategies can be designed to promote e-bike adoption. This will contribute to a cleaner

environment and improved public health in Kathmandu Valley, fostering a sustainable transportation future.

Future research should investigate how e-bikes are currently being used for commuting within the valley, including analyzing trip lengths, frequency of use, and integration with other transportation modes. By addressing these knowledge gaps, researchers can contribute to a more comprehensive understanding of e-bikes' role in Kathmandu Valley's transportation landscape. This knowledge can empower policymakers and industry stakeholders to develop effective strategies for promoting wider e-bike adoption and fostering a more sustainable transportation future for the region.

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