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A Study on Consumer Buying Behaviour towards Energy Efficient Home Appliances in Coimbatore District

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Abstract: *This analytical study examines the consumer buying behaviour towards energy-efficient home appliances in Coimbatore district. With increasing concerns about energy conservation, rising electricity costs, and environmental sustainability, consumers are gradually shifting towards appliances that consume less energy and offer long-term cost savings. Energy-efficient appliances such as refrigerators, air conditioners, washing machines, and LED lighting are gaining popularity as they help reduce electricity consumption and promote sustainable living.*

The study aims to analyse the level of awareness among consumers regarding energy-efficient appliances and to evaluate how factors such as energy ratings, product price, brand image, performance, and environmental concern influence their purchasing decisions. Primary data was collected from consumers in Coimbatore district using a structured questionnaire. Statistical tools such as Percentage Analysis, Chi-square Test, and ANOVA were used for analysing the collected data.

The findings reveal that factors such as energy efficiency ratings, product durability, and electricity cost savings significantly influence consumer purchase decisions. However, high initial price and lack of awareness among some consumers act as barriers to adoption. The study provides useful insights for manufacturers and marketers to promote energy-efficient appliances through better awareness campaigns, competitive pricing, and effective marketing strategies.

Keywords: Consumer Buying Behaviour, Energy-Efficient Appliances, Energy Conservation, Purchase Decision, Sustainable Consumption

I. INTRODUCTION

The growing need for comfort, convenience, and efficiency has led to an increased use of home appliances such as refrigerators, air conditioners, washing machines, and LED lighting. At the same time, concerns about rising electricity costs, energy conservation, and environmental sustainability have created awareness about energy-efficient appliances that reduce electricity consumption while maintaining performance.

Consumer buying behaviour for these appliances is influenced by factors such as product price, brand reputation, energy ratings, performance, and environmental awareness. Understanding these patterns is important for businesses to target consumers effectively and for policymakers to promote sustainable practices.

Coimbatore, with its expanding middle-class population and rising adoption of modern appliances, provides an ideal context to study consumer behaviour. This research aims to explore the factors affecting the purchase of energy-efficient home appliances and to provide insights for promoting energy conservation and sustainable consumption.

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OBJECTIVES OF THE STUDY:

- To analyse consumer awareness levels
- To examine consumer perception & attitude towards benefits of energy efficient appliances.

STATEMENT OF THE PROBLEM:

Energy-efficient home appliances offer significant benefits, including lower electricity bills and reduced environmental impact, yet their adoption among consumers in Coimbatore remains inconsistent. High initial costs, limited awareness of energy ratings, and uncertainty about long-term savings often discourage households from choosing energy-efficient options.

Consumer perceptions, such as concerns about maintenance, product complexity, and brand influence, further affect purchase decisions. While government programs and awareness campaigns exist, there is limited localized research on how these efforts translate into actual consumer behaviour in Coimbatore.

The central problem, therefore, is the gap between awareness of energy efficiency and actual adoption of energy-efficient home appliances. This study aims to explore the factors influencing consumer buying behaviour, including awareness, perceptions, price sensitivity, and demographic influences, to provide insights for manufacturers, marketers, and policymakers promoting sustainable energy consumption.

SCOPE OF THE STUDY:

The study focuses on understanding consumer buying behaviour towards energy-efficient home appliances in Coimbatore district. It examines the factors that influence purchase decisions, awareness of energy-efficient products, and barriers to adoption.

The research is geographically limited to Coimbatore due to its rapid urbanization, rising household income, and increasing adoption of modern appliances. The study specifically considers household appliances such as refrigerators, air conditioners, washing machines, LED lighting, and other BEE-rated products, excluding commercial or industrial equipment.

The target consumers include households and individuals in Coimbatore, considering demographic factors such as age, gender, income, education, and family size. The study explores aspects of consumer behaviour including awareness of energy efficiency, purchase determinants (price, brand, features, environmental concerns), attitudes toward sustainability, willingness to pay a premium, and challenges in adoption.

Data will be collected through structured surveys and analysed using descriptive and inferential statistics to identify trends and key factors influencing adoption. The research reflects the current market scenario and provides insights for manufacturers, marketers, and policymakers aiming to promote energy-efficient appliances.

II. RESEARCH METHODOLOGY

The study is based on an opinion survey conducted among 51 consumers using a convenience sampling method. Primary data was collected through a structured questionnaire, while secondary data was gathered from journals, reports, and previous studies.

The collected data was analysed using the following statistical tools:

• Percentage Analysis
• Chi-square Test
• ANOVA Analysis

III. REVIEW OF LITERATURE:

Nguyen, N., Lobo, A., & Greenland, S. (2016) conducted a study on the purchase of energy-efficient household appliances in emerging markets, focusing on Vietnamese consumers. The study integrated motivational and cognitive perspectives using a values, knowledge, attitudes, and behaviour model. It examined how biospheric, egoistic, and

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altruistic values influence attitudes and purchasing behaviour. The study attempts to bring out the factors affecting adoption, finding that altruistic and biospheric values, along with consumer knowledge, reduce perceived inconvenience and increase pro-environmental behaviour. Attitudes were found to be a strong predictor of both purchase intention and actual behaviour, highlighting the importance of value orientation and consumer awareness in promoting energy-efficient appliances.

Guo, S.-D., Lu, C.-P., Li, H., & Zhu, N. (2021) conducted a study on how energy efficiency labels influence consumer purchase behaviour for household appliances in China. The research used survey data from 396 consumers and applied structural equation modeling based on theories of planned behaviour, social cognition, and signaling. The study focused on variables such as label cognition, trust, perceived value, and external factors like education and publicity. It attempts to bring out the factors influencing purchase intention and adoption, finding that label trust and perceived value strongly affect consumer decisions, and that effective labeling combined with policy support can significantly enhance the adoption of energy-efficient appliances.

IV. DATA ANALYSIS AND INTERPRETATION

CHI-SQUARE TEST:

H_0: There is **no significant association** between gender and awareness of energy-efficient appliances.
H_1: There is a **significant association** between gender and awareness of energy-efficient appliances.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.598[a]	3	.660
Likelihood Ratio	1.758	3	.624
Linear-by-Linear Association	.925	1	.336
N of Valid Cases	51		

a. 3 cells (37.5%) have expected count less than 5. The minimum expected count is 2.35.

Interpretation

The Chi-square test was conducted to examine whether awareness of energy-efficient home appliances differs between male and female respondents.The Pearson Chi-square value obtained was 1.598 with 3 degrees of freedom, and the corresponding p-value was 0.660. Since the p-value is greater than the significance level of 0.05, the null hypothesis (H_0) is accepted and the alternative hypothesis (H_1) is rejected.

Therefore, it can be concluded that there is no statistically significant relationship between gender and awareness of energy-efficient home appliances. This indicates that male and female respondents in the surveyed sample show similar levels of awareness regarding energy-efficient appliances. Although some cells had expected counts below 5, which may slightly affect the precision of the test, the overall result still suggests that gender does not significantly influence awareness in this context.

ONE WAY ANOVA

H0: There is no significant difference in respondents' overall attitude toward energy-efficient home appliances across different educational qualification groups.

H1: There is a sgnificant difference in respondents' overall attitude toward energy-efficient home appliances across different educational qualification groups.

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ANOVA

What is your overall attitude towards energy-efficient home appliances?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.517	2	1.258	1.501	.233
Within Groups	40.229	48	.838		
Total	42.745	50			

Interpretation

The results of the one-way ANOVA show an F-value of 1.501 with degrees of freedom (2, 48) and a p-value of 0.233. Since the p-value is greater than the significance level of 0.05, the null hypothesis (H_0) is accepted and the alternative hypothesis (H_1) is rejected.

Therefore, it can be concluded that there is no statistically significant difference in respondents' overall attitude toward energy-efficient home appliances across different educational qualification groups. This indicates that respondents with different educational backgrounds—Higher Secondary, Undergraduate, and Postgraduate—display similar attitudes toward energy-efficient appliances.

The F-value indicates that the variation between educational groups is smaller than the variation within the groups, suggesting that educational qualification does not significantly influence respondents' attitudes toward energy-efficient home appliances in this sample. Other factors such as personal experience, awareness, or perceived long-term benefits may have a stronger influence on shaping these attitudes.

PERCENTAGE ANALYSIS

CHART NO 4.1: AGE OF THE RESPONDENTS

Age Group	No. of Respondents	Percentage (%)
15–18 years	7	13.7%
18–21 years	10	19.6%
21–25 years	27	52.9%
25–30 years	7	13.7%
Total	**51**	**100%**

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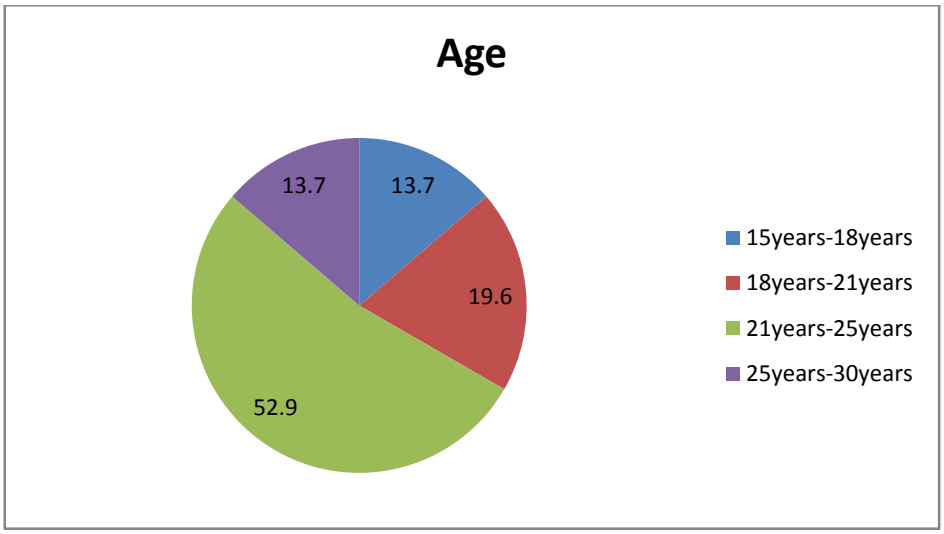

Interpretation

Out of 51 respondents, the majority (52.9%) belong to the 21–25 years age group, indicating that most participants are young adults. About 19.6% fall under the 18–21 years category. The age groups 15–18 years and 25–30 years each represent 13.7% of the respondents. This shows that the study mainly reflects the opinions of individuals in the 21–25 years age bracket. Therefore, the findings are largely influenced by young consumers.

V. CONCLUSION

The study on consumer buying behaviour toward energy-efficient home appliances in Coimbatore district reveals that while awareness of such products exists, knowledge levels are moderate. Consumers generally hold positive attitudes toward energy-efficient appliances, recognizing their benefits for cost savings and environmental protection.

Price remains a key factor influencing adoption, though many respondents are willing to pay more for quality and energy efficiency. Demographic factors such as age, gender, education, and income showed no significant effect on awareness, attitude, or purchase behaviour, indicating relatively uniform perceptions across consumer groups.

The findings emphasize the importance of clear labeling, effective marketing, information campaigns, and financial incentives to encourage adoption. Promoting energy-efficient appliances requires a combination of awareness, affordability, and trust-building, supporting sustainable consumption and energy conservation in households.

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