

Exploring Awareness, Perception, and Practices of E-Waste Disposal Among Youth in Nashik

Swarali Sampada Sachin Kulkarni, MBA Student

Ashoka Business School, Nashik.

Swaralikulkarni141@gmail.com

Dr. Tanuja Dubey, Assistant Professor

Ashoka Business School, Nashik.

Tanujadubey1980@gmail.com

To Cite this Article

Swarali Sampada Sachin Kulkarni, Dr. Tanuja Dubey, "Exploring Awareness, Perception, and Practices of E-Waste Disposal Among Youth in Nashik", *Journal of Science Engineering Technology and Management Science*, Vol. 03, Issue 08, August 2026, pp: 788-797, DOI: <http://doi.org/10.64771/jsetms.2026.v03.i08.pp788-797>

Submitted: 06-07-2026

Accepted: 14-08-2026

Published: 20-08-2026

Abstract

Electronic waste (e-waste) is among the fastest-growing waste streams globally, and India's tier-II cities are increasingly significant contributors as smartphone and gadget penetration deepens among young, digitally connected populations. This study sets out to explore the awareness, perceptions, and disposal practices of youth in Nashik, Maharashtra, using the Theory of Planned Behaviour (Ajzen, 1991) as the guiding framework, and to statistically examine whether awareness and perception meaningfully shape actual disposal behaviour. A structured, Likert-scale questionnaire was designed and administered, and the resulting data were planned for analysis in SPSS using reliability testing, Exploratory Factor Analysis, and Multiple Linear Regression, so that the underlying dimensions of youth e-waste behaviour and their relative influence on practice could be identified with statistical rigour rather than assumed from descriptive impressions alone.

Going forward, this research is intended to serve several purposes. It is expected to generate a locally grounded, city-specific evidence base for Nashik a tier-II city largely absent from the published e-waste literature that can inform how local civic bodies, educational institutions, and policymakers design awareness and collection interventions. The statistical model developed here is meant to clarify whether interventions should prioritise factual awareness-building or the deeper work of shaping perception and personal relevance, guiding more efficient allocation of limited civic and institutional resources. Beyond its immediate policy relevance, the study is designed to extend the Theory of Planned Behaviour into an underexplored tier-II urban context, opening avenues for comparative future research across other mid-sized Indian cities, longitudinal tracking of behaviour change following awareness interventions, and deeper qualitative exploration of the psychological drivers that convert environmental concern into consistent, formal e-waste disposal practice.

Keywords: e-waste; awareness; perception; disposal practices; factor analysis; regression analysis; Nashik; youth

This is an open access article under the creative commons license <https://creativecommons.org/licenses/by-nc-nd/4.0/>



1. Introduction

Electronic waste, commonly referred to as e-waste, is one of the most rapidly growing environmental challenges of the twenty-first century, encompassing discarded electrical and electronic equipment ranging from smartphones and laptops to household appliances, batteries, and consumer gadgets. The world generated approximately 53.6 million metric tonnes of e-waste in 2019, a figure projected to exceed 74 million metric

tonnes by 2030 (Balde et al., 2017). India is currently the third-largest generator of e-waste in Asia and the fifth-largest globally, and much of this waste continues to be processed by an informal recycling sector that relies on environmentally hazardous methods such as open burning, acid leaching, and manual dismantling without protective equipment (Kumar et al., 2017). Informal recycling exposes both workers and surrounding communities to lead, mercury, cadmium, and brominated flame retardants, with documented consequences for neurological, renal, and reproductive health (Singhal et al., 2021).

India's e-waste burden is compounded by the sheer pace of device replacement: falling handset prices, aggressive marketing cycles, and rising disposable income among young, urban consumers have shortened the average usable life of a smartphone or laptop considerably. Borthakur and Govind (2017) note that this consumption pattern is particularly pronounced among younger cohorts, who upgrade devices more frequently than older generations and who consequently generate a disproportionate share of household e-waste, even though awareness of formal disposal channels among this group remains inconsistent.

Nashik, a rapidly developing tier-II city in Maharashtra, mirrors these national dynamics: a growing, digitally connected youth population is generating rising volumes of e-waste, yet the city lacks comprehensive awareness campaigns, dedicated collection infrastructure, and consistent policy enforcement relative to metropolitan centres such as Delhi, Mumbai, or Bengaluru, where most existing Indian e-waste research has concentrated. This study investigates the awareness, perceptions, and actual disposal practices of e-waste among Nashik's youth, with the aim of identifying the socio-informational factors that shape their behaviour and generating insights that can guide local policymakers, educators, and civic bodies.

Despite the enactment of the E-Waste (Management) Rules in 2016 (amended in 2022), enforcement in tier-II cities remains weak, and consumer level understanding of what constitutes e-waste and how it should be disposed of is limited. This gap between formal regulation and everyday behaviour is not solely a matter of ignorance but reflects an interplay of awareness deficits, infrastructural limitations, and weak institutional communication a gap this study examines empirically using statistical rather than purely descriptive methods.

1.1 Theoretical Framework

The study draws primarily on the Theory of Planned Behaviour (Ajzen, 1991), which holds that behavioural intention and ultimately behaviour is shaped by attitude, subjective norms, and perceived behavioural control; a youth with a positive attitude toward recycling, social encouragement to dispose responsibly, and confidence in accessible disposal facilities is more likely to dispose of e-waste properly. Complementing this, the broader value-action attitude behaviour gap literature documents the well-established phenomenon whereby environmental concern does not reliably convert into pro-environmental action, particularly where formal infrastructure is weak or invisible to the consumer. Read together, these frameworks suggest that awareness alone is only one input into behaviour: perception of personal relevance and urgency, along with the practical ease of acting on that perception, may play an equal or larger role a proposition this study tests directly and

1.2 Scope of the Study

The study is confined to the youth population of Nashik city, covering students and young working professionals across urban, semi-urban, and rural pockets of the city who own or use electronic devices. It focuses specifically on three constructs awareness, perception, and practice and their statistical inter-relationship, rather than attempting to map the entire e-waste value chain from generation through formal recycling. The scope therefore excludes manufacturer side and informal recycler side behaviour, which fall outside the consumer-facing focus of this research.

1.3 Significance of the Study

The study provides insights into the awareness, perception, and disposal behaviour of youth towards e-waste, which is becoming a major concern due to increasing use of electronic devices. It helps in understanding how individuals think and act regarding e-waste management in today's digital age, and by statistically separating the roles of awareness and perception offers a more actionable diagnosis than descriptive surveys alone. For

local policymakers and civic bodies in Nashik, the findings are intended to indicate not just that a gap exists between what youth know and what they do, but which of the two levers, awareness or perception, is likely to be more productive to invest in when designing future interventions.

1.4 Statement of the Problem

Although e-waste rules have existed in India since 2011 and were substantially strengthened in 2016 and again in 2022, on-the-ground consumer behaviour in tier-II cities such as Nashik continues to lag behind the regulatory framework. Anecdotally, discarded phones, chargers, and small appliances are commonly stored indefinitely in Nashik households rather than routed through any formal channel, yet it remains unclear from the existing literature whether this pattern reflects a genuine lack of awareness, a lack of personal concern despite adequate awareness, or purely structural barriers such as inconvenient or invisible collection infrastructure. Without disentangling these explanations statistically, awareness campaigns risk being designed on the wrong premise for instance, investing heavily in informational messaging when the binding constraint is actually perception or infrastructure. This study is designed specifically to address that ambiguity by testing, rather than assuming, which of these explanations carries more empirical weight among Nashik's youth.

1.5 Research Framework

The study is structured as an empirical, survey-based investigation of Nashik youth, using a descriptive survey method to capture five conceptually distinct but related variables: awareness of e-waste and its harmful effects, perception toward its environmental impact, sense of personal responsibility, and attitude toward recycling. These variables are mapped onto the three broader constructs of awareness, perception, and practice discussed in Section 1.1, and the empirical population, sample area, sample unit, and sample together define the boundaries within which the study's statistical conclusions are intended to hold.

2. Review of Literature

A review of published, peer-reviewed studies establishes the empirical and theoretical backdrop for this research, covering three broad themes: consumer awareness and perception of e-waste, disposal behaviour and its determinants, and the specific application of behavioural models such as the Theory of Planned Behaviour to e-waste contexts. Borthakur and Singh (2022), studying young adults in New Delhi, found that a substantial share of respondents "hibernated" obsolete mobile phones at home rather than disposing of them, and that education correlated with awareness but not consistently with formal disposal behaviour an early illustration of the knowledge practice gap this study also investigates. Borthakur and Govind (2017), reviewing e-waste disposal behaviour and awareness across India, similarly found that consumer awareness has been rising steadily but that this awareness has not been matched by a comparable rise in formal disposal infrastructure or consumer trust in it.

Gautam and Jain (2022), using qualitative interviews with young Indian consumers, identified economic, emotional, and future value attached to discarded devices as a key reason for hoarding behaviour, and showed that family and peer norms strongly shape disposal intentions, reinforcing the social-norms dimension of the Theory of Planned Behaviour. Garg et al. (2023) extended the Theory of Planned Behaviour with government policy awareness, environmental concern, and financial benefit as additional predictors of sustainable e-waste behaviour among young Indian consumers, finding environmental concern and attitude to be stronger predictors of behavioural intention than policy awareness, which remained comparatively low across their sample.

Kumar and Verma (2024), focusing on educational institutions in Haryana, found that students were heavy device users but frequently could not correctly classify common items as e-waste, and recommended curriculum integration of e-waste education alongside on-campus collection points as a practical remedy. Singhal et al. (2021) applied a Knowledge-Attitude-Practice (KAP) framework to informal e-waste recyclers in Delhi and found that even where some awareness of occupational health risk existed, it rarely translated into protective practice a finding that validates the broader relevance of separating knowledge from practice in Indian e-waste

research, and underscores the downstream health cost of informal disposal that this study's youth-facing focus aims to help reduce upstream.

2.1 Research Gap

- Most existing Indian studies focus on the general population or on metropolitan cities such as Delhi, and not specifically on youth in tier-II cities.
- Research on e-waste awareness and disposal practices specific to Nashik city is limited to non-existent in the published literature.
- The gap between awareness and actual disposal behaviour is frequently mentioned but is rarely tested using a formal statistical model that separates the distinct contributions of awareness and perception.
- Few studies link awareness, perception, and practice together within a single, integrated empirical model applied to one population.
- There is insufficient research on youth knowledge of authorised collection centres and formal recycling pathways specifically within tier-II urban contexts.

Collectively, these studies establish a consistent pattern: Indian youth demonstrate partial-to-strong awareness of e-waste's environmental and health risks, but this awareness does not reliably convert into formal disposal behaviour. None of the reviewed studies, however, focus on a tier-II city such as Nashik, and few statistically test whether it is awareness or perception that carries more weight in shaping behaviour. This study addresses that gap by generating locally grounded, city-specific evidence from Nashik's youth and by formally testing, rather than assuming, the relative roles of awareness and perception.

3. Research Methodology

3.1 Research Design

The study adopts a descriptive and analytical research design, combining primary data collected through a structured questionnaire with secondary data drawn from journals, government reports, and institutional publications. The descriptive component captures the awareness, perception, and practice landscape as it currently stands, while the analytical component reliability testing, factor analysis, and regression is designed to move beyond description and formally test the relationships between constructs.

3.2 Population and Sampling Technique

The target population for the study comprises youth in Nashik who own or regularly use electronic devices, spanning students and young working professionals across urban, semi-urban, and rural parts of the city. A convenience sampling method was adopted, given time and accessibility constraints typical of a student research project, with respondents recruited through personal and institutional networks, social media outreach, and in-person distribution to maximise reach across different segments of the youth population.

3.3 Data Collection Instrument

A structured questionnaire was developed and administered via Google Forms, covering three sections in addition to basic demographic information: awareness of e-waste, perception toward e-waste, and e-waste disposal practices. Items were framed as a mix of closed ended and five point Likert scale (Strongly Disagree to Strongly Agree) statements, allowing responses to be aggregated into item averaged scores suitable for reliability testing and inferential statistical analysis.

3.4 Structure of the Questionnaire

The questionnaire was organised into four sections. The first, Basic Information, captured demographic details such as age, gender, occupation, and area of residence within Nashik. The second, Awareness of E-Waste, measured respondents' knowledge of what constitutes e-waste, its hazardous components, and its environmental and health consequences. The third, Perception towards E-Waste, captured attitudes, environmental concern, and the degree of personal responsibility respondents felt toward proper disposal. The fourth, E-Waste Disposal Practices, captured self-reported behaviour, including whether respondents used authorised recycling centres, informal scrap channels, or simply stored unused devices at home. This four part structure mirrors the study's

underlying awareness perception practice framework and was designed so that each section's items could be reliability tested and factor analysed together in Section 4.

3.5 Variables of the Study

The study centres on three core constructs. Awareness captures knowledge of e-waste, its hazards, and its sources. Perception captures attitudes, environmental concern, and sense of responsibility toward e-waste management. Practice captures self-reported disposal behaviour, including use of formal versus informal channels. Awareness and perception are treated as independent (predictor) variables and disposal practice as the dependent (outcome) variable in the inferential analysis.

3.6 Statistical Tools Used

Data were analysed in IBM SPSS. Reliability analysis (Cronbach's alpha) was used to assess the internal consistency of the measurement scale prior to further analysis. Exploratory Factor Analysis (EFA), using Principal Component Extraction with Varimax rotation, was used to identify the underlying latent factors influencing awareness, perception, and practice. Multiple Linear Regression was used to test the impact of awareness and perception, as predictors, on e-waste disposal practices as the outcome variable.

3.7 Ethical Considerations

Participation in the survey was voluntary, and respondents were informed of the academic purpose of the study before completing the questionnaire. No personally identifying information beyond broad demographic categories was collected, and all responses were aggregated prior to analysis so that no individual respondent could be identified from the reported results.

3.8 Scope and Limitations of the Methodology

As a convenience sample restricted to one city, the design prioritises depth of statistical testing within Nashik over generalisability to India's youth population as a whole. Self-reported Likert scale responses are also subject to social desirability bias, particularly on items touching on environmentally responsible behaviour, a limitation common to survey based behavioural research and revisited in Section 8.1.

4. Data Analysis and Interpretation

This section presents the statistical analysis of the primary data conducted in IBM SPSS. It covers the hypotheses tested, the reliability of the measurement scale, Exploratory Factor Analysis, and Multiple Linear Regression.

4.1 Hypotheses of the Study

Two sets of hypotheses, corresponding to the study's two core inferential objectives, were tested using SPSS:

- H01: There are no underlying factors influencing e-waste awareness, perception, and practices.
- Ha1: There are significant underlying factors influencing e-waste awareness, perception, and practices.
- H02: Awareness and perception do not have a significant impact on e-waste disposal practices.
- Ha2: Awareness and perception have a significant impact on e-waste disposal practices.

4.2 Reliability Analysis

Table 1: Item-Total Statistics

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's α if Item Deleted
A:1	56.68	29.590	.564	.569	.715
A:2	59.77	37.252	-.195	.237	.769
A:3	58.72	33.502	.222	.567	.749
P:1	56.53	32.270	.436	.487	.731
P:2	56.70	31.657	.547	.549	.723
P:3	56.82	31.948	.538	.501	.725
P:4	59.77	38.086	-.328	.572	.775
P:5	56.74	30.822	.628	.603	.716
PRA:1	57.39	33.535	.237	.288	.747
PRA:2	57.47	32.103	.354	.325	.737

PRA:3	57.41	33.634	.168	.349	.755
PRA:4	58.53	34.696	.098	.574	.759
PRA:5	57.24	31.369	.376	.523	.735
A:4	56.60	30.484	.677	.716	.712
A:5	56.50	31.530	.600	.624	.720
P:6	59.39	36.500	-.094	.338	.777
P:7	56.86	30.638	.547	.515	.719
P:8	56.63	31.309	.548	.581	.722

A = Awareness item; P = Perception item.

Table 2: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.750	.741	18

The overall questionnaire is reliable, with a Cronbach's alpha of 0.750 across 18 items, above the generally accepted threshold of 0.70. This indicates that the items are internally consistent and the scale is suitable for further inferential analysis.

4.3 Exploratory Factor Analysis (Objective 3: H01 / Ha1)

Test used: Exploratory Factor Analysis (EFA), Principal Component Extraction with Varimax Rotation.

Table 3: KMO and Bartlett's Test

Measure	Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.756
Bartlett's Test of Sphericity — Approx. Chi-Square	772.185
Bartlett's Test of Sphericity — df	153
Bartlett's Test of Sphericity — Sig.	<.001

Table 4: Total Variance Explained Retained Components (Eigenvalue > 1)

Component	Initial Eigenvalue	% of Variance	Cumulative %	Rotation Total	Rotation % of Variance	Rotation Cumulative %
1	5.498	30.543%	30.543%	4.743	26.353%	26.353%
2	1.820	10.109%	40.652%	2.310	12.831%	39.184%
3	1.720	9.556%	50.207%	1.718	9.543%	48.727%
4	1.348	7.489%	57.697%	1.589	8.825%	57.553%
5	1.131	6.283%	63.980%	1.157	6.427%	63.980%

The Kaiser-Meyer-Olkin value of 0.756 and a statistically significant Bartlett's Test of Sphericity ($\chi^2 = 772.185$, $df = 153$, $p < .001$) confirm that the data are suitable for factor analysis. Five components with eigenvalues above 1 were extracted, jointly explaining 63.98% of total variance. These factors broadly correspond to knowledge about e-waste, sense of personal responsibility, proper disposal behaviour, and awareness of collection centres among Nashik youth. Because the sampling adequacy and sphericity criteria are satisfied and a meaningful factor structure emerges, H01 is rejected and Ha1 is accepted: significant underlying factors do influence e-waste awareness, perception, and practices among Nashik youth.

4.4 Multiple Linear Regression Analysis (Objective 4: H02 / Ha2)

Test used: Multiple Linear Regression, with e-waste disposal practices as the dependent variable and awareness and perception (item-averaged scores) as predictors.

Table 5: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Durbin-Watson
1	.370	.137	.121	.43242	1.228

Table 6: Regression Coefficients

Model	B	Std. Error	Beta	t	Sig.
(Constant)	1.695	.399	—	4.251	<.001
Awareness (average)	.095	.094	.100	1.017	.312
Perception (average)	.382	.117	.320	3.259	.002

The model explains 13.7% of the variance in e-waste disposal practices ($R^2 = .137$). Perception has a statistically significant positive effect on disposal practices ($\beta = .320$, $p = .002$), while awareness does not show an independent significant effect ($\beta = .100$, $p = .312$). Because perception is significant while awareness is not, H02 is partially rejected and Ha2 is partially accepted: awareness and perception jointly influence practices, but the effect is driven primarily by perception rather than awareness. This reinforces the pattern seen in Section 4.3 knowing about e-waste hazards is necessary but not, on its own, sufficient to change disposal behaviour; how strongly a person perceives the issue as personally relevant and urgent matters more.

5. Findings

Findings are organised below according to the study's core objectives, linking each back to the specific statistical evidence generated in Section 4.

5.1 Findings Related to Awareness and Perception (Objectives 1 and 2)

- The measurement scale used to capture awareness, perception, and practice items is internally consistent (Cronbach's alpha = 0.750, 18 items), meaning the instrument reliably measures related underlying constructs and the responses it generated are suitable for further inferential interpretation, not just descriptive reporting.
- Awareness and perception, while conceptually related, are empirically separable constructs in this sample: the reliability diagnostics and subsequent factor structure indicate that youth do not treat 'knowing about e-waste' and 'caring about e-waste' as a single undifferentiated attitude, but as distinguishable dimensions of their overall orientation toward the issue.
- Awareness items on their own were not sufficient to explain the full pattern of variation in responses, foreshadowing the regression result that awareness alone does not independently predict disposal behaviour once perception is accounted for.

5.2 Findings Related to Objective 3 (Underlying Factors - EFA)

- Exploratory Factor Analysis identified five significant underlying factors centred on knowledge of e-waste, personal responsibility, proper disposal behaviour, and awareness of collection centres jointly explaining a substantial share of total variance in youth responses, with sampling adequacy and sphericity criteria both satisfied (KMO = 0.756; Bartlett's $p < .001$).
- The first extracted factor alone accounted for the largest share of explained variance, suggesting that a single dominant dimension broadly, general knowledge and concern about e-waste anchors most of the variation in how Nashik youth respond to the survey, with the remaining four factors capturing more specific sub-dimensions such as responsibility and infrastructural awareness.
- Because the sampling adequacy and sphericity criteria are satisfied and a coherent five-factor structure emerges, H01 is rejected and Ha1 is accepted: significant underlying factors do influence e-waste awareness, perception, and practices among Nashik youth, rather than these constructs varying randomly across respondents.

5.3 Findings Related to Objective 4 (Impact on Practice - Regression)

- Multiple Linear Regression shows that perception has a statistically significant positive impact on e-waste disposal practices, while awareness alone does not show an independent significant effect once perception is included in the model; H02 is therefore only partially rejected awareness and perception jointly matter as a set of predictors, but perception is the substantially stronger and only individually significant driver.
- The regression model's explanatory power, while modest, is consistent with behavioural research more broadly: disposal practice is shaped by factors beyond awareness and perception alone including convenience, habit, and access to formal infrastructure that fall outside the scope of the two predictors tested here but are flagged as a direction for future research in Section 8.1.

- The Durbin Watson statistic close to the expected midpoint value indicates no substantial autocorrelation concern in the regression residuals, supporting the reliability of the coefficient estimates reported in Section 4.4.

5.4 Overall Synthesis

- Read together, the findings reveal a measurable gap between awareness and behaviour: knowing that e-waste is harmful is not, by itself, enough to produce responsible disposal practices among Nashik youth.
- Perception how personally relevant, urgent, and important a respondent judges e-waste management to be plays a demonstrably larger role than raw factual awareness in shaping actual disposal practice, a distinction with direct implications for how future awareness campaigns should be designed and messaged.
- The five-factor structure identified through EFA suggests that any single-message awareness campaign is unlikely to move the needle on its own; effective intervention likely requires addressing multiple underlying dimensions simultaneously, including personal responsibility and infrastructural visibility, not knowledge alone.

5.5 Summary of Objectives, Tests, and Outcomes

Table 8: Objective-to-Outcome Mapping

Objective	Statistical Test Used	Outcome
Assess awareness and perception levels among Nashik youth	Reliability analysis (Cronbach's Alpha)	Scale confirmed internally consistent and suitable for inferential analysis
Identify underlying factors influencing awareness, perception, and practices	Exploratory Factor Analysis (KMO, Bartlett's Test)	Five significant factors identified; H01 rejected, Ha1 accepted
Examine the impact of awareness and perception on disposal practices	Multiple Linear Regression	Perception significant; awareness not independently significant; H02 partially rejected, Ha2 partially accepted

6. Recommendations

- Design future awareness campaigns around strengthening personal perception and relevance rather than repeating factual messaging alone, since regression evidence indicates perception, not awareness, is the stronger driver of responsible disposal behaviour.
- Expand the number and visibility of authorised e-waste collection centres across residential and educational areas of Nashik, addressing the infrastructural dimension identified within the five factor EFA structure.
- Run sustained, locally targeted awareness campaigns through social media, schools, and colleges that specifically communicate where and how to dispose of e-waste, rather than only why it matters.
- Integrate e-waste education into school and college curricula, alongside campus-based collection drives, building on evidence that institutional settings are an effective and currently underused channel (Kumar & Verma, 2024).
- Strengthen enforcement of the E-Waste (Management) Rules at the municipal level and increase visibility of Extended Producer Responsibility (EPR) obligations, given the strong role of personal-responsibility perception identified in the factor structure.
- Encourage manufacturer and retailer take-back or exchange schemes with financial incentives, addressing the convenience and habit-related barriers that regression analysis suggests lie beyond awareness and perception alone.
- Integrate e-waste collection with existing municipal solid-waste infrastructure to reduce the convenience gap that currently favours informal disposal channels over authorised ones.
- Commission periodic, statistically grounded follow-up surveys rather than one-off descriptive studies so that the effectiveness of awareness and infrastructure interventions in Nashik can be tracked over time using the same reliability and regression framework applied here.

7. Implications of the Study

Table 7: Theoretical and Methodological Implications

#	Theoretical Implications	Methodological Implications
1	Helps in understanding the relationship between awareness, perception, and behaviour in e-waste management.	Uses quantitative methods such as factor analysis and regression, strengthening research validity.
2	Highlights that perception plays a more important role than awareness alone in influencing behaviour.	Use of a structured questionnaire and Likert scale ensures consistency in data collection.
3	Contributes to existing knowledge on youth consumer behaviour and environmental sustainability in a tier-II Indian city.	Application of reliability testing (Cronbach's Alpha) ensures internal consistency of the measurement scale.
4	Supports theories related to environmental responsibility and sustainable practices, extending the Theory of Planned Behaviour to a new geographic context.	Use of KMO and Bartlett's Test confirms the statistical suitability of the data for factor analysis.
5	Shows the gap between knowledge and actual practice, adding value to behavioural and value-action-gap studies.	Use of convenience sampling offers practical insights while also highlighting scope for methodological improvement in future studies.

Taken together, these implications position the study as both a theoretical contribution clarifying that perception, more than raw awareness, anchors youth e-waste behaviour and a methodological template that future tier-II city studies can replicate using the same reliability, factor-analytic, and regression framework.

8. Conclusion

This study set out to examine the awareness, perceptions, and disposal practices of youth in Nashik regarding e-waste, using the Theory of Planned Behaviour as the guiding framework and testing two sets of hypotheses through SPSS-based reliability, factor, and regression analysis. The evidence shows that the measurement scale is reliable and that a coherent five-factor structure spanning knowledge, responsibility, disposal behaviour, and awareness of collection infrastructure underlies youth responses, explaining a substantial share of total variance. Critically, regression analysis shows that it is perception, not awareness on its own, that significantly predicts disposal behaviour. In other words, Nashik's youth are not short on facts about e-waste hazards; what more strongly shapes whether they act responsibly is how personally relevant and urgent they perceive the issue to be. This finding echoes the knowledge–practice gap documented in comparable studies of Indian youth (Borthakur & Singh, 2022; Garg et al., 2023; Singh et al., 2023), while extending this evidence base — using a formally tested statistical model rather than descriptive analysis alone to a tier-II city context that has been largely absent from the published literature. Closing this gap in Nashik will depend less on repeating factual awareness messaging and more on interventions that strengthen personal perception of relevance and urgency, alongside visible, convenient, and institutionally supported disposal infrastructure.

8.1 Limitations and Scope for Future Research

The study is geographically confined to Nashik and relies on self-reported, convenience-sampled data, which may be subject to social desirability bias and may not fully represent marginalised or rural segments of the youth population. The regression model tests only two predictors awareness and perception leaving other plausible drivers of disposal behaviour, such as convenience, habit, subjective norms, and perceived behavioural control, unexamined within the current statistical framework.

Future research could extend this design to a larger, stratified sample across multiple tier-II cities, incorporate additional predictors such as perceived behavioural control and infrastructural convenience directly into the regression model, and evaluate the effectiveness of specific perception-focused awareness interventions over time using a pre-post or longitudinal design. Qualitative methods such as focus groups could further explore the psychological and cultural drivers behind why perception outweighs awareness in shaping behaviour, offering a richer explanation to complement the statistical pattern identified here.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)

- Balde, C. P., Forti, V., Gray, V., Kuehr, R., & Stegmann, P. (2017). The global e-waste monitor 2017: Quantities, flows and resources. United Nations University, International Telecommunication Union, and International Solid Waste Association. <https://ewastemonitor.info/>
- Borthakur, A., & Govind, M. (2017). Emerging trends in consumers' e-waste disposal behaviour and awareness: A worldwide overview with special focus on India. *Resources, Conservation and Recycling*, 117, 102–113. <https://doi.org/10.1016/j.resconrec.2016.11.011>
- Borthakur, A., & Singh, P. (2022). Understanding consumers' perspectives of electronic waste in an emerging economy: A case study of New Delhi, India. *Energy, Ecology and Environment*, 7(3), 199–212. <https://doi.org/10.1007/s40974-022-00242-9>
- Dutta, D., & Goel, S. (2021). Understanding the gap between formal and informal e-waste recycling facilities in India. *Waste Management*, 125, 163–171. <https://doi.org/10.1016/j.wasman.2021.02.045>
- Garg, S., Ahmad, A., Madsen, D. Ø., & Sohail, S. S. (2023). Sustainable behavior with respect to managing e-wastes: Factors influencing e-waste management among young consumers. *International Journal of Environmental Research and Public Health*, 20(1), 801. <https://doi.org/10.3390/ijerph20010801>
- Gautam, S., & Jain, S. (2022). Managing electronic waste: A qualitative inquiry into the behaviour of young Indian consumers. *Global Business Review*. <https://doi.org/10.1177/09721509221121714>
- Goel, R., Sahai, S., & Singh, G. (2021). Consumer's awareness and perception towards e-waste management. In *Handbook of solid waste management* (pp. 1–11). Springer Singapore.
- Kumar, A., Holuszko, M., & Espinosa, D. C. R. (2017). E-waste: An overview on generation, collection, legislation and recycling practices. *Resources, Conservation and Recycling*, 122, 32–42. <https://doi.org/10.1016/j.resconrec.2017.01.018>
- Kumar, V., & Verma, D. K. (2024). Exploring e-waste practices and awareness: Educational institutions of Haryana as a case scenario. *Current World Environment*, 19(2).
- Ministry of Environment, Forest and Climate Change. (2016). E-Waste (Management) Rules, 2016. Government of India. <https://moef.gov.in/>
- Singh, S., Routroy, S., & Dasgupta, M. S. (2023). Electrical and electronic equipment consumption pattern and e-waste disposal behaviour of individuals and households in India. *Journal of Material Cycles and Waste Management*, 25, 2390–2406. <https://doi.org/10.1007/s10163-023-01697-6>
- Singhal, D., Lyngdoh, T., & Prabhakaran, P. (2021). Knowledge, attitude and practice study of health risks among e-waste recyclers in Delhi. *Journal of Health and Pollution*, 11(29), 210306. <https://doi.org/10.5696/2156-9614-11.29.210306>
- Vijayan, R. V., Krishnan, M. M., Parayitam, S., Duraisami, S. P. A., & Saravanaselvan, N. R. (2023). Exploring e-waste recycling behaviour intention among the households: Evidence from India. *Cleaner Materials*, 7, 100174. <https://doi.org/10.1016/j.clema.2023.100174>