Awareness of the Economic, Environmental and Social Impacts of Fast Fashion across Generations: An Exploratory Survey Comparing Generation Z with Older Consumers in Urban India

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ABSTRACT

Generation Z (Gen Z) is often described as both highly sustainability-aware and heavily reliant on fast fashion. However, its awareness of fast fashion's impacts is rarely compared with that of older consumers. This exploratory study measures self-reported awareness of the economic, sustainability, environmental and social impacts of fast fashion across age groups, with Gen Z as the key comparison group. A cross-sectional online survey, distributed through personal networks and onward sharing, was completed by 52 respondents between 28 September and 14 October 2026; 80.8% lived in the Delhi National Capital Region (NCR). Fourteen respondents (26.9%) were Gen Z (aged 15–26) and 38 were aged 31 or older. We measured awareness with 42 four-point items and analysed it using reliability estimates, non-parametric tests across domains and age groups, sensitivity analyses, and content analysis of open-ended responses. Mean awareness was moderate in all domains (2.58–2.72 on a 1–4 scale). It was highest for the employment and cost logic of fast fashion (up to 80.8% 'aware' or 'very much aware') and lowest for the short-term costs of sustainable production (36.5%) and garment workers' conditions (42.3%). Differences between domains were negligible and not robust. Gen Z respondents scored descriptively higher than older respondents in every domain (Cohen's d = 0.17–0.49), but no age-group difference was statistically significant. Most respondents proposed social media (71.2%) and formal education or campaigns (57.7%) as ways to raise Gen Z awareness. Because the sample is small and unbalanced across age groups, was recruited by snowball sampling and is concentrated in one region, and because awareness was self-reported rather than objectively tested, the findings are descriptive and hypothesis-generating. The sustainability and environmental items overlapped in content and are therefore also interpreted as a single environmental–sustainability dimension. Nevertheless, the study provides an item-level, intergenerational assessment of fast-fashion impact awareness in urban India and indicates that, across all age groups, awareness of labour-related issues is lower than awareness of market dynamics.

Keywords: fast fashion; Generation Z; intergenerational comparison; consumer awareness; sustainability; garment workers; India

1. INTRODUCTION

Fast fashion is a business model built on rapid design-to-retail cycles, high product variety and low prices. Its environmental costs are well documented. Niinimäki et al. (2020) estimate that the fashion industry produces more than 92 million tonnes of textile waste and consumes about 79 trillion litres of water each year, with impacts at every stage of the garment life cycle. Peters et al. (2021) show that the climate impact of clothing and footwear consumption rose between 2000 and 2015 even as per-garment efficiency improved, because production volumes grew faster. Social costs fall disproportionately on workers and communities in producing regions, a pattern Bick et al. (2018) described as global environmental injustice.

The economic case is more contested. Fast fashion creates employment and export revenue in garment-producing economies and widens access to fashionable clothing (Williams, 2022). Its low prices, however, depend partly on low wages and on environmental costs that retail prices do not reflect (Bick et al., 2018). Informed consumption therefore requires knowledge that spans the economic, environmental, and social domains.

Generation Z, defined by the Pew Research Center as people born from 1997 onwards (Dimock, 2019), is central to this debate. The cohort is simultaneously exposed to social media trend cycles and sustainability discourse (Vladimirova et al., 2024), and studies report that sustainable and fast-fashion purchasing coexist within it (Kang & Badal, 2025).

Claims about Gen Z's distinctiveness, however, are difficult to evaluate without comparison groups. Whether younger consumers are more aware of fast fashion's impacts than older generations is an empirical question that single-cohort studies cannot answer.

Two further gaps motivate this study. First, much of the literature measures attitudes, intentions or purchasing rather than awareness of specific impacts, even though knowledge is widely regarded as a necessary but not sufficient condition for pro-environmental behaviour (Kollmuss & Agyeman, 2002; Peleg Mizrachi & Sharon, 2025). Second, evidence from India remains limited and focuses mainly on consumption patterns and their demographic correlates (Bishnoi & Guru, 2023). However, India is both a major garment producer and a fast-growing consumer market.

The study was originally designed to assess Gen Z awareness. Because the achieved sample included respondents from several older age groups, with only 14 of 52 respondents in the Gen Z age range, it is reported as an exploratory intergenerational survey in which Gen Z is the key comparison group. It makes three contributions: an item-level profile of awareness across 42 specific impacts; a comparison of Gen Z with older respondents, and across age bands, on the same instrument; and a summary of respondents' own proposals for raising Gen Z awareness. The study is descriptive and does not test causal relationships, measure behaviour, or support generalisation beyond the sample. Because the sample is small and regionally concentrated, the study is best regarded as a pilot that describes patterns and refines the instrument for a larger, multi-region study.

2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Economic impacts

Research on the economics of fast fashion highlights both economic growth and its associated hidden costs. Knošková and Garasová (2019) find that fast-fashion purchasing increases consumer spending, while low durability of garments encourages repeat purchases. Meskini et al. (2024) report that conventional fashion firms outperformed sustainable fashion firms on sales and profitability, and that sustainable firms were more exposed to rising costs during the COVID-19 pandemic. Long and Nasiry (2022) model how consumer sensitivity to trends and the low cost of introducing new styles lead firms to reduce product quality. Williams (2022) argues that the net social effect may be positive once employment in producing countries is counted, a conclusion that remains contested. Taken together, these studies suggest that informed consumers need to understand cost structures, labour costs, market growth, product durability, and the economic implications of transitioning to sustainable production.

2.2 Environmental and sustainability impacts

The environmental dimension of fast fashion is the most extensively researched area in the existing literature. Studies have documented its environmental impacts, including high water use and pollution associated with dyeing and finishing processes (Bailey et al., 2022), greenhouse gas emissions (Peters et al., 2021), and textile waste from short garment lifespans (Niinimäki et al., 2020). Reviewing 119 articles, Olivar Aponte et al. (2024) highlighted that the social, psychological and economic drivers of unsustainable consumption are less well understood than its environmental outcomes. Although circular practices such as reuse, repair and resale are widely promoted as sustainable alternatives (Centobelli et al., 2022), their benefits are not necessarily guaranteed. For instance, a survey of 1,009 US consumers found a positive correlation between secondhand and new clothing purchases, suggesting that second-hand consumption may not always replace new garment purchases (Peleg Mizrachi & Sharon, 2025). Furthermore, Kiran (2025) adds that sustainability standards designed in the Global North may be less effective when applied without regard to the needs and realities of Indian manufacturing contexts.

2.3 Social impacts

The social dimension of fast fashion research focuses on labour conditions, gender-related issues and impacts on local communities. Bick et al. (2018) show that workers and residents living near production sites bear a disproportionate burden of health and environmental risks. Hewamanne and South (2023) document how women garment workers in Bangladesh and Sri Lanka experience the combined challenges of unsafe working conditions and environmental degradation. Similarly, Brewer (2019) argues that existing law does not hold brands adequately accountable for these adverse impacts. However, consumer-side social effects, such as trend pressure, social status signalling and pressure on local craft producers, are less studied. This study addresses this gap by incorporating specific items that examine each of these dimensions.

2.4 Generational differences in fashion sustainability

Gen Z is often perceived as more sustainability-minded than older generations, but comparative evidence is limited and mixed. Abrar et al. (2021) find that attitudes are the strongest predictor of green clothing purchase intention among Gen Y and Gen Z consumers. Kang and Badal (2025) report that sustainable and fast-fashion purchasing coexist among female Gen Z college students, and Lu et al. (2022) show that perceived greenwashing lowers young consumers' intentions to purchase green products. Social media plays a dual role, both accelerating trends and carrying sustainability trends to younger cohorts (Vladimirova et al., 2024). In the Delhi-NCR region, consumer age has been found to influence both clothing expenditure and the share of spending on fast fashion (Bishnoi & Guru, 2023). However, whether these age-related differences also extend to awareness of the economic, environmental and social impacts of fast fashion remains relatively underexplored.

Two cautions apply when interpreting generational comparisons. First, generational boundaries are based on conventions rather than defined categories. Second, in cross-sectional data, differences between age groups may reflect life-stage factors (such as student status) or broader period effects rather than generational characteristics. Accordingly, the present study treats differences across age groups as descriptive associations rather than evidence of distinct generational attitudes or behaviours.

2.5 Conceptual framework

The study draws on two complementary theoretical frameworks. The triple bottom line framework (Elkington, 1997) organises impacts into three domains: economic, environmental and social. This study extends this classification by adding a fourth, sustainability-oriented domain covering product life-cycle and circularity issues. Because this fourth domain overlaps substantially in content with the environmental domain (Section 4.4), the two are also analysed together as a combined environmental–sustainability dimension, which corresponds to the environmental pillar of the triple bottom line. Frick et al. (2004) distinguish among different forms of environmental knowledge, including system knowledge (how a problem works), action-related knowledge (what actions can be taken), and effectiveness knowledge (how effective those actions are). The awareness items included in this study primarily assess self-rated system knowledge, which is considered relatively distant from actual behaviour. Similarly, the theory of planned behaviour (Ajzen, 1991) suggests that such knowledge is expected to influence behaviour only indirectly, through attitudes, subjective norms and perceived behavioural control. The present study therefore measures a potential antecedent of consumer behaviour rather than purchasing behaviour itself, and asks whether self-rated system knowledge is evenly distributed across impact domains, specific impacts and age groups. Identifying variations in awareness can highlight areas where targeted consumer education and communication initiatives are most needed.

3. OBJECTIVES, RESEARCH QUESTIONS AND EXPLORATORY EXPECTATIONS

The study has four objectives:

1. To describe the socio-demographic profile of respondents.

2. To assess respondents' awareness of the economic, social, environmental and sustainability impacts of fast fashion.

3. To compare awareness across age groups, with Gen Z as the key comparison group.

4. To recommend ways to raise Gen Z awareness of the economic, social, environmental and sustainability impacts of fast fashion.

These objectives are addressed through four research questions:

- RQ1. What is the level of self-reported awareness in each domain, and which specific impacts are least recognised?
- RQ2. Does awareness differ across domains?
- RQ3. Does awareness differ between Gen Z and older respondents, or across age bands?
- RQ4. What measures do respondents propose for raising Gen Z awareness, and what personal actions do they commit to?

Two exploratory expectations, tested two-tailed, were derived from the literature:

- E1. Awareness differs across domains, with environmental and sustainability awareness exceeding social and economic awareness, reflecting the prominence of environmental issues in research and public discourse (Olivar Aponte et al., 2024).
- E2. Gen Z respondents report higher awareness than older respondents, reflecting greater exposure to sustainability content on social media (Vladimirova et al., 2024).

4. METHODOLOGY

4.1 Design and data collection

The study used a cross-sectional online survey. The response file has the structure of a Google Forms export, and the questionnaire was presented in English. The survey link was shared through personal networks, and respondents were invited to forward it to others (snowball sampling). Because the number of people who received the link is unknown, we cannot calculate a response rate. Fifty-two responses were submitted between 28 September and 14 October 2026. Sampling was non-probabilistic, so the sample does not represent any defined population. Snowball sampling was chosen because the study was conceived as a small, exploratory survey for which no sampling frame was available. The method reaches respondents quickly but tends to produce samples that resemble the initial contacts' own social networks. The achieved sample therefore over-represents educated, higher-income urban households in the Delhi-NCR region, and consumers from other regions of India, rural areas and lower-income groups are absent or present only in small numbers. No sample size was set in advance; the precision achievable with the final sample is reported through a sensitivity power analysis (Section 4.7).

4.2 Participants

Most respondents were women (67.3%), married (67.3%) and residents of the Delhi-NCR region (80.8%) (Table 1). Nearly half (48.1%) were aged over 50, and 57.7% held a postgraduate qualification or higher. No respondent reported a monthly household income below ₹50,001, and 42.3% preferred not to report income.

Table 1. Respondent profile (N = 52)

Characteristic	Category	n	%
Gender	Female	35	67.3
	Male	17	32.7
Age (years)	15–18	9	17.3

	19–22	1	1.9
	23–26	4	7.7
	27–30	0	0
	31–40	4	7.7
	41–50	9	17.3
	Above 50	25	48.1
Comparison group	Gen Z (15–26)	14	26.9
	Older (31 and above)	38	73.1
Highest education	Postgraduate or above	30	57.7
	Graduate/undergraduate / B.Ed.	13	25
	Higher secondary or secondary	9	17.3
Occupation	Salaried employee	15	28.8
	Homemaker	11	21.2
	Student	10	19.2
	Business owner / self-employed	12	23.1
	Retired / unemployed/other	4	7.7
Marital status	Married	35	67.3
	Single	15	28.8
	Prefer not to say	2	3.8
Monthly household income	Above ₹2,00,000	21	40.4
	₹1,00,001–₹2,00,000	7	13.5
	₹50,001–₹1,00,000	2	3.8
	Prefer not to say	22	42.3
Educational stream	Commerce	21	40.4
	Science	20	38.5
	Humanities/Arts	8	15.4
	Engineering/fashion / not applicable	3	5.8
Primary language	Hindi	29	55.8
	English	19	36.5
	Multiple languages	4	7.7
Residence	Delhi NCR	42	80.8
	Outside Delhi NCR	10	19.2

Note. The Delhi-NCR region comprises Delhi, Noida, Gautam Buddha Nagar, Ghaziabad, Gurugram, Faridabad and Rewari. 'Outside Delhi NCR' includes three respondents who are residents outside India. No respondent was recorded in the 27–30 age band. 'Housewife' was merged with 'Homemaker'. All ten students were aged 15–22.

4.3 Generational classification

Generations were defined following Dimock (2019): Gen Z, born 1997 onwards; Millennials, 1981–1996; and Generation X, 1965–1980. At the time of data collection, Gen Z members were therefore aged 29 or younger. The questionnaire recorded age in bands that map only approximately onto generations (Table 2). The three youngest bands (15–26) fall entirely within Gen Z, and no respondents were recorded in the 27–30 band. The 31–40 band corresponds to Millennials, the 41–50 band spans Millennials and Generation X, and the 'Above 50' band spans Generation X and older generations.

Table 2. Correspondence between age bands and generations at data collection (late 2026)

Age band	Approximate birth years	Generation (Dimock, 2019)	n
15–26	c. 2000–2011	Gen Z	14
27–30	c. 1996–1999	Gen Z (27–29) or Millennial (30)	0
31–40	c. 1986–1995	Millennials	4
41–50	c. 1976–1985	Millennials and Generation X	9
Above 50	1975 or earlier	Generation X and older	25

Because the older bands straddle generational boundaries, two groupings are used: a binary contrast between Gen Z (15–26) and older respondents (31 and above), and an age-band variable with four non-empty levels (15–26, 31–40, 41–50 and above 50). The empty 27–30 band is reported but cannot be entered into any test. Generational labels for the older bands are approximate.

4.4 Instrument

The questionnaire comprised nine socio-demographic items, 45 closed awareness items in four blocks and five open-ended questions. Each block ended with an open-ended question identifying its domain (economic, sustainability, environmental, or social), and we assigned block labels accordingly. All awareness items used a four-point unipolar scale: 1 = not at all aware, 2 = slightly aware, 3 = aware, 4 = very much aware.

Three items appeared twice with identical wording (water requirements of fibre production, influence on social norms and growth of ethical-fashion movements). The second copy of each was excluded from scoring and used as an informal consistency check, leaving 42 items scored: economic (10), sustainability (10), environmental (8), and social (14). Item stems took two forms: eight items were direct questions (‘Are you aware that…’ or ‘Are you aware of…’) and 34 were graded questions (‘How much are you aware…’ or ‘How would you rate your awareness…’). Because stem format may itself influence responses, a possible wording effect is examined in Section 5.6.

The sustainability and environmental blocks overlap substantially in content. Both include items on water pollution from dyeing (S3, V3), textile waste from consumption and disposal (S7, V6), and the benefits of reuse, repair, resale, and recycling (S9, V8). The sustainability block consists mostly of environmental life-cycle and circularity content. The two blocks are reported separately to preserve the questionnaire’s structure but should not be interpreted as distinct constructs. To limit the influence of this overlap on interpretation, the 18 items of the two blocks are also summarised as a combined environmental–sustainability score (Section 5.1), and substantive conclusions are based on this combined dimension together with the economic and social domains.

Measurement validity. The items were written to reflect impacts documented in the literature reviewed in Section 2: cost structures, labour costs, market growth and the costs of transition for the economic domain (Knošková & Garasová, 2019; Long & Nasiry, 2022; Meskini et al., 2024); water use, pollution, emissions and textile waste for the environmental and sustainability domains (Bailey et al., 2022; Niinimäki et al., 2020; Peters et al., 2021); and labour conditions, community effects and consumer culture for the social domain (Bick et al., 2018; Hewamanne & South, 2023; Vladimirova et al., 2024). This mapping supports the content coverage of the instrument, but four features limit its construct validity. First, the items measure subjective (self-rated) knowledge, which is related to, but distinct from, objective knowledge (Brucks, 1985); respondents may feel aware of an impact without being able to describe it accurately. Second, the sustainability and environmental blocks overlap, as described above, which weakens the discriminant validity of these two domains. Third, two stem formats were used, so item wording varies partly with content. Fourth, the dimensional structure of the instrument could not be examined by factor analysis at this sample size. Scores should therefore be read as indicators of perceived awareness rather than as validated measures of knowledge, and the very high internal consistency reported in Section 5.1 should not be taken as evidence of construct validity.

4.5 Data preparation and quality checks

Respondent names were removed before analysis, and no names or other identifying details are reported. One value was missing (one social-domain item, n = 51); domain scores were computed as the mean of available items. Exact agreement between the duplicated items was 88.5%, 86.3% and 86.5% (quadratic-weighted Cohen's κ = 0.92, 0.90 and 0.78). Four respondents (7.7%) gave the same response to all 42 items, a pattern consistent with straightlining; they were retained in the main analysis and excluded in a sensitivity analysis.

The commitment question was blank for the first five submissions (28 September to 2 October 2026); the next submission was on 12 October, and all subsequent respondents answered it. This pattern suggests that the question was added or made compulsory after data collection began. In one response, the social-impact suggestions field also contained the text of the commitment question and its answer, and several long, highly structured open-ended answers may have been pasted from other sources. All open-ended responses were retained as submitted.

4.6 Ethics and participant protection

Nine respondents were aged 15–18, and the response file included respondents' names, which were removed before analysis. To show how the results depend on these respondents, all analyses involving age were repeated without the nine respondents aged 15–18 (Section 5.5).

4.7 Analysis

Analyses were run in Python 3.13 (pandas 3.0, NumPy 2.5, SciPy 1.18 and scikit-learn 1.9). Internal consistency was estimated with Cronbach's α and corrected item–total correlations. Domain means are reported with 95% percentile bootstrap confidence intervals (5,000 resamples). Item-level results are reported as means, standard deviations and the percentage of respondents answering 'aware' or 'very much aware'.

Domain differences (RQ2) were tested with the Friedman test, with Kendall's W as the effect size, followed by pairwise Wilcoxon signed-rank tests with Holm correction (effect size $r = Z/\sqrt{N}$). Age-group differences (RQ3) were tested with Mann–Whitney U tests for the binary Gen Z contrast, reporting rank-biserial correlations and Cohen's d, and with Kruskal–Wallis tests and Spearman correlations across the four non-empty age bands. Gender, student status, postgraduate education, and educational stream were compared in the same way (for groups with $n \geq 4$). Non-parametric tests were used because domain scores are derived from ordinal items and two domain distributions were non-normal (Shapiro–Wilk p = .017 and .046). All tests were two-tailed with α = .05; no adjustment was made across the separate, exploratory demographic comparisons.

Statistical power was limited. A sensitivity power analysis for the Gen Z contrast (two-sample t-test approximation, n = 14 and 38, α = .05) indicated 80% power only for effects of $d \approx 0.90$ or larger and about 35% power for a medium effect (d = 0.5). Non-significant results therefore cannot be interpreted as evidence of no difference. Two sensitivity analyses were conducted, excluding the four straightlining respondents (n = 48) and excluding the nine respondents aged 15–18 (n = 43). Stem-format effects were examined by comparing each respondent's mean on direct-question items with their mean on graded-question items (Wilcoxon signed-rank test).

Open-ended answers were analysed by content analysis at the respondent level. The four suggestion questions were pooled because many respondents repeated or cross-referenced earlier answers. A codebook of eight categories was developed inductively from a full reading of the responses, applied with a keyword dictionary and checked against the text; commitment answers were coded into five categories in the same way. Categories were not mutually exclusive. A single analyst performed the coding, so inter-coder reliability could not be assessed, and counts should be treated as approximate. To support replication, the category labels and example content are reported in Table 9. Future studies should use at least two independent coders and report inter-coder agreement (for example, Cohen's κ).

5. RESULTS

Results are reported in two categories. Descriptive patterns (means, percentages and effect sizes) characterise this sample. Statistically supported findings are those for which an inferential test reached $p < .05$ and the result held in sensitivity analyses. Section 6.1 summarises which findings fall into each category. To aid interpretation, effect sizes are reported alongside p values. By convention, r values (including rank-biserial r) of about .10, .30 and .50, and Cohen's d values of about 0.2, 0.5 and 0.8, indicate small, medium and large effects, respectively (Cohen, 1988), and Kendall's W values below .10 indicate a negligible effect. All p values are two-tailed, and all confidence intervals are 95% percentile bootstrap intervals.

5.1 Reliability and overall awareness (RQ1)

All four domains showed high internal consistency (Table 3). Cronbach's α ranged from .923 (economic) to .975 (social), and all corrected item–total correlations were .55 or above. Across all 42 items, α was .985, a value suggesting item redundancy and a dominant general factor rather than four distinct dimensions (Section 6.3).

Awareness was moderate. Domain means ranged from 2.58 to 2.72, between 'slightly aware' (2) and 'aware' (3), and every upper confidence limit was below 3. Of the 2,183 item responses, 43.6% were 'aware', 32.5% 'slightly aware', 14.7% 'very much aware', and 9.2% 'not at all aware'. Eleven respondents (21.2%) had an overall mean of 3 or above.

Combined environmental–sustainability score. Because the sustainability and environmental blocks overlap in content (Section 4.4), their 18 items were also combined into a single score. As there were no missing values on these items, the combined mean equals the item-weighted average of the two domain means: approximately M = 2.68 overall, 2.86 for Gen Z respondents and 2.60 for older respondents. The combined score leads to the same conclusions as the separate domains: awareness of environmental and sustainability impacts was moderate, similar to economic (M = 2.65) and social (M = 2.58) awareness, and descriptively higher among Gen Z than among older respondents.

Table 3. Reliability and descriptive statistics by domain (N = 52)

Domain	Items	α	Item–total r	M	SD	Mdn	95% CI of M	M ≥ 3, n (%)
Economic	10	0.923	.55–.78	2.65	0.63	2.6	2.49–2.82	18 (34.6)
Sustainability	10	0.956	.75–.91	2.72	0.71	2.8	2.53–2.90	23 (44.2)
Environmental	8	0.957	.76–.89	2.62	0.73	2.69	2.42–2.82	18 (34.6)
Social	14	0.975	.77–.90	2.58	0.74	2.61	2.38–2.78	15 (28.8)
All items	42	0.985	—	2.64	0.66	2.75	—	11 (21.2)

Note. Scale 1 = not at all aware to 4 = very much aware. CI = 95% percentile bootstrap interval (5,000 resamples). α for the social domain and for all items is based on the 51 complete cases.

5.2 Item-level awareness

Awareness varied more between items than between domains (Table 4). The five most-recognised impacts concerned the cost and market logic of fast fashion or visible resource effects: employment creation in producing countries (80.8% aware or very much aware), low prices reflecting low-cost production (75.0%), outsourcing to reduce costs (75.0%), depletion of water and raw materials (75.0%) and water pollution from dyeing (73.1%). The five least-recognised were the short-term costs firms face when adopting sustainable practices (36.5%), working conditions in supply chains (42.3%), and effects on workers' families and communities (42.3%), effects of rapid, cheap sales on company revenues (44.2%) and the fossil-fuel origin of synthetic fibres (44.2%). The link between low-cost labour and workers' wages had the highest share of 'not at all aware' responses (17.3%).

A post-hoc contrast within the social domain compared six labour items (So1–So6) with six consumer-culture items (So7–So12). Labour items scored lower (M = 2.51 vs 2.67; Wilcoxon $p = .009$, $r = .36$). The contrast was not planned and is reported as a descriptive pattern for future testing.

Table 4. Item-level awareness (N = 52 unless noted)

Code	Item (abbreviated)	M	SD	% aware
E1	Low prices reflect low-cost production, materials and labour	2.9	0.69	75
E2	Outsourcing to developing countries cuts costs	2.88	0.78	75
E3	Low-cost labour and garment workers' wages	2.48	0.94	51.9
E4	Contribution to growth of the global clothing market	2.67	0.79	63.5
E5	Employment creation in producing countries	2.88	0.76	80.8
E6	Rapid, cheap sales and company revenues	2.5	0.92	44.2
E7	Affordability across income groups	2.6	0.77	53.8
E8	Consumer demand and trends drive profitability	2.77	0.76	69.2
E9	Short-term cost increase of sustainable production	2.31	0.85	36.5
E10	Changing trends and financial performance	2.52	0.85	51.9
S1	Impact of large-scale production	2.67	0.79	63.5
S2	Depletion of water and raw materials	2.87	0.82	75
S3	Water pollution from dyeing and processing	2.92	0.79	73.1
S4	Greenhouse-gas emissions from production and transport	2.67	0.9	57.7
S5	Microplastic pollution from synthetic fibres	2.69	0.9	63.5
S6	Short garment lifespan across the life cycle	2.67	0.76	61.5
S7	Disposal and growing textile waste	2.75	0.97	61.5
S8	Overconsumption and unnecessary waste	2.62	0.84	57.7
S9	Reuse, repair, resale and recycling reduce impact	2.79	0.8	67.3
S10	Differences from sustainable alternatives	2.52	0.85	48.1
V1	Environmental impacts of production and consumption	2.56	0.78	53.8
V2	Large water requirements of fibre production	2.6	0.87	50
V3	Chemical and wastewater release from dyeing	2.73	0.79	67.3
V4	Fossil-fuel-based raw materials for synthetics	2.4	0.85	44.2
V5	Impacts at every life-cycle stage	2.56	0.83	50
V6	Rising consumption and textile waste	2.73	0.84	63.5
V7	Persistence of discarded clothing in landfills	2.63	0.84	59.6
V8	Extending garment life reduces impacts	2.75	0.84	65.4
Code	**Item (abbreviated)**	**M**	**SD**	**% aware**
So1	Working conditions in supply chains	2.44	0.87	42.3
So2	Inadequate health and safety standards	2.54	0.83	51.9
So3	Wages insufficient for basic needs	2.58	0.89	53.8
So4	Women workers and gender inequality	2.56	0.85	51.9
So5	Child labour in supply chains	2.5	0.87	51.9
So6	Effects on workers' families and communities	2.44	0.83	42.3
So7	Trend pressure on young consumers	2.65	0.86	59.6
So8	Influence on social norms (n = 51)	2.63	0.87	56.9
So9	Social status and self-image	2.79	0.89	67.3
So10	Fashion experience across income groups	2.63	0.84	63.5
So11	Traditional clothing and local cultures	2.6	0.82	57.7
So12	Small-scale artisans and traditional producers	2.71	0.85	61.5
So13	Social links between consumers and producing communities	2.52	0.9	51.9

So14	Ethical-fashion movements and campaigns	2.54	0.8	50

Note. E = economic; S = sustainability; V = environmental; So = social. '% aware' = percentage answering 'aware' or 'very much aware'. Items E1–E5, E8, V3 and So4 use a direct-question stem ('Are you aware…'); all others use a graded stem.

5.3 Differences across domains (RQ2, E1)

The Friedman test detected a difference across the four domains in the full sample, $\chi^2(3) = 9.75$, $p = .021$, but the effect was negligible (Kendall's $W = 0.06$), and no pairwise contrast remained significant after Holm correction (Table 5). The largest unadjusted difference was sustainability over social ($p = .016$, $r = .34$; Holm-adjusted $p = .093$). The overall difference remained non-significant after excluding respondents aged 15–18 (Section 5.5). E1 is not supported: environmental awareness did not exceed economic awareness ($M = 2.62$ vs 2.65). Domain scores were strongly inter-correlated (Spearman's $\rho = .71–.80$, all $p < .001$); the strongest associations were environmental with social ($\rho = .80$) and environmental with sustainability ($\rho = .80$).

Table 5. Pairwise Wilcoxon signed-rank tests between domains (N = 52)

Contrast	Median difference	p (unadjusted)	p (Holm)	r
Sustainability vs social	0.08	0.016	0.093	0.34
Sustainability vs environmental	0.08	0.054	0.27	0.27
Economic vs sustainability	−0.10	0.179	0.715	0.19
Economic vs social	0	0.413	1	0.11
Environmental vs social	0	0.439	1	0.11
Economic vs environmental	0	0.907	1	0.02

5.4 Differences across age groups (RQ3, E2)

Gen Z versus older respondents. Gen Z respondents scored higher than older respondents in every domain, by 0.11 to 0.36 scale points (Table 6). Effect sizes were small to medium ($d = 0.17–0.49$), largest in the social domain. However, no difference was statistically significant (all $p \geq .20$). With about 35% power to detect $d = 0.5$, these results are inconclusive rather than evidence of equivalence. E2 is not supported by this sample.

Table 6. Awareness by comparison group

Domain	Gen Z (n = 14) M (SD)	Older (n = 38), M (SD)	U	p	Rank-biserial r	Cohen's d
Economic	2.73 (0.66)	2.62 (0.62)	285.5	0.694	0.07	0.17
Sustainability	2.92 (0.69)	2.64 (0.72)	327.5	0.207	0.23	0.39
Environmental	2.79 (0.73)	2.56 (0.73)	323	0.24	0.21	0.31
Social	2.84 (0.65)	2.48 (0.76)	328.5	0.2	0.23	0.49
All items	2.82 (0.64)	2.57 (0.66)	309.5	0.375	0.16	0.39

Note. Positive effect sizes indicate higher awareness among Gen Z respondents. Mann–Whitney U, two-tailed.

Age bands. The age-band breakdown (Table 7) shows that the binary contrast conceals a non-monotonic pattern. Respondents aged 15–26 had the highest means; those aged 50 and above were close behind, and those aged 31–40 and 41–50 had the lowest means. Neither the Kruskal–Wallis tests (all $p \geq .14$) nor the Spearman correlations between age band and awareness ($\rho = -.12$ to $.06$, all $p \geq .40$) were significant. With only four respondents aged 31–40, the middle-age pattern is descriptive and should not be interpreted as a trend.

Table 7. Awareness by age band, M (SD)

Domain	15–26 (n =14)	27–30 (n= 0)	31–40 (n = 4)	41–50 (n = 9)	Above 50 (n=25)	Kruskal–Wallis H(3), p	Spearman ρ, p
Economic	2.73-0.66	—	2.55-0.61	2.33-0.49	2.74-0.64	3.18, .365	.06, .661
Sustainability	2.92-0.69	—	2.53-0.91	2.58-0.65	2.68-0.74	1.87, .601	−.12, .405
Environmental	2.79-0.73	—	2.34-0.91	2.32-0.44	2.68-0.78	4.09, .252	−.03, .834
Social	2.84-0.65	—	2.25-0.83	2.17-0.56	2.63-0.79	5.43, .143	−.02, .903
All items	2.82-0.64	—	2.4-0.8	2.34-0.47	2.68-0.7	3.40, .334	.00, .985

Note. The 27–30 band contained no respondents and was excluded from all tests; tests compare the four non-empty bands. Spearman correlations use these bands coded 1–4 from youngest to oldest; negative values indicate lower awareness in older bands.

Other respondent characteristics. No other characteristic was significantly associated with awareness: gender (p = .27–.95), student status (p = .30–.87), postgraduate education (p = .25–.94) and educational stream (Kruskal–Wallis p = .10–.51). Student status and Gen Z membership overlap almost completely (all ten students were Gen Z), so their effects cannot be separated.

5.5 Sensitivity analyses

Excluding the four straightlining respondents left the results essentially unchanged (Table 8). Excluding the nine respondents aged 15–18 left domain means similar but removed the significant Friedman result (p = .124). It also reduced the Gen Z group to five respondents, too few for a meaningful comparison; their descriptive means were higher than those of older respondents in every domain (overall M = 3.01 vs 2.57), but none of the differences was significant.

Table 8. Sensitivity analyses

Analysis	N	Domain means (Econ / Sust / Env / Soc)	Friedman $\chi^2(3)$, p, W	Smallest unadjusted pairwise p	Gen Z vs older
Main analysis	52	2.65 / 2.72 / 2.62/ 2.58	9.75, .021, 0.06	.016 (Sust vs Soc)	n = 14 vs 38; p =.20–.69
Excluding straightliners	48	2.62 / 2.69 / 2.59/ 2.55	9.75, .021, 0.07	.017 (Sust vs Soc)	Not computed
Excluding respondents aged 15–18	43	2.67 / 2.67 / 2.62/ 2.55	5.75, .124, 0.04	.052 (Sust vs Soc)	n = 5 vs 38; p =.10–.58

5.6 Possible wording effect

Respondents' mean scores on the eight direct-question items were higher than their means on the 34 graded-question items (M = 2.74 vs 2.61; Wilcoxon p = .018, r = .33). Six of the eight direct-question items are in the economic domain, including three of the five highest-scoring items (E1, E2 and E5), so part of the apparent advantage of market-mechanics items may reflect wording rather than knowledge. The low labour scores are less exposed to this effect: five of the six labour items use the graded stem, and the two labour-related direct-question items (E3, M = 2.48; So4, M = 2.56) still scored below the overall mean of 2.64. Because item content and stem format are confounded, this analysis cannot establish a wording effect.

5.7 Suggested measures and personal commitments (RQ4)

All four suggestion questions asked respondents of all ages how to raise Gen Z awareness. As a result, the responses capture both Gen Z and older respondents' views on reaching Gen Z. Forty-nine of the 52 respondents gave at least one substantive suggestion. Social media dominated: 37 respondents (71.2%) proposed influencers, reels, short videos or online campaigns, and 30 (57.7%) proposed formal routes such as school or university

teaching, workshops, seminars or campaigns (Table 9). A smaller group proposed more specific mechanisms: direct exposure, such as visits to polluted rivers, landfills or artisan communities (11 respondents); cost-per-wear framing (8), for example comparing a ₹159 shirt 'which falls apart after 3 washes' with a durable ₹599 one; point-of-sale transparency or regulation (6); and gamified challenges (6).

Thirteen of the 14 Gen Z respondents proposed social media, compared with 24 of 38 older respondents (Fisher's exact p = .043; exploratory, uncorrected). Older respondents more often proposed formal education (23 of 38 vs 7 of 14) and cost-per-wear framing (8 vs 0); these smaller differences were not tested.

Table 9. Coded suggestions for raising Gen Z awareness (respondent level, N = 52)

Category	**Example content**	**All, n (%)**	**Gen Z (n = 14)**	**Older (n= 38)**
Social media and influencers	Reels, short videos, influencer campaigns, Instagram	37 (71.2)	13	24
Formal education and campaigns	School or university teaching, workshops, seminars, drives	30 (57.7)	7	23
Circular practices	Thrift stores, swaps, reuse, resale apps, repair	13 (25.0)	2	11
Experiential exposure	Visits to factories, rivers, landfills, artisans; volunteering	11 (21.2)	3	8
Cost-per-wear and economic framing	Real cost and durability per wear	8 (15.4)	0	8
Transparency and regulation	Garment tagging, disclosure rules, brand scorecards	6 (11.5)	1	5
Gamification and challenges	Leaderboards, '30 wears' or no-buy challenges, quizzes	6 (11.5)	1	5
Storytelling and documentaries	Worker testimonies, documentaries	6 (11.5)	1	5

Note. Categories are not mutually exclusive. Three respondents gave no codable suggestion. Counts derive from single-analyst, keyword-assisted coding and are approximate.

Forty-six respondents answered the commitment question (the first five submissions left it blank; Section 4.5). The most common commitments were awareness-raising or advocacy (19), reduced or need-based purchasing (16) and reuse, recycling, donation or swapping (14). Eight respondents committed to organising community events, such as clothing-swap drives or workshops, and five to buying from ethical brands or local artisans. Seven answers contained no relevant commitment: five were non-substantive (for example, 'do not know' or 'will not take any action'), one reflected on the industry without naming an action, and one named an unrelated action (water harvesting).

6. DISCUSSION

6.1 Summary of evidence

Table 10 separates statistically supported findings from descriptive-only findings. Most of the study's substa-

ntive conclusions rest on descriptive patterns, which is appropriate for an exploratory survey of this size but limits the strength of any claim.

Table 10. Strength of evidence for the main findings

Finding	**Evidence**	**Status**
Awareness is moderate in all domains; no domain mean reaches 'aware'	Bootstrap CIs all below 3	Descriptive; consistent across sensitivity analyses

Market-mechanics impacts are better known than labour and transition-cost impacts	Item means and percentages; post-hoc labour vs consumer- culture contrast ($p = .009$)	Descriptive; post-hoc test only; partly confounded with item wording
Awareness differs across domains.	Friedman $p = .021$, $W = 0.06$; no pairwise contrast survives correction	Not robust: negligible effect; not significant when respondents aged15–18 are excluded
Domains reflect a single general awareness factor	$\rho = .71–.80$; $\alpha = .985$ across all items	Descriptive; factor structure not tested
Gen Z respondents report higher awareness than older respondents	$d = 0.17–0.49$; all $p \geq .20$	Descriptive only; underpowered
Awareness is lowest among respondents aged 31–50	Age-band means; Kruskal–Wallis $p \geq .14$	Descriptive only; very small subgroups
Direct-question items score higher than graded items	Wilcoxon $p = .018$	Statistically supported association; content and wording confounded
Gen Z respondents favour social media more than older respondents	Fisher's exact $p = .043$	Exploratory and uncorrected; based on approximate coding

6.2 Moderate, uneven awareness

Across all age groups, awareness was moderate and uneven. No domain mean reached 'aware', and only about one respondent in five averaged 'aware' or above. This is consistent with reports that young consumers' sustainability concern often rests on general rather than specific knowledge (Kang & Badal, 2025; Olivar Aponte et al., 2024). Because the items measure self-rated system knowledge (Frick et al., 2004) and recruitment through personal networks may have favoured interested respondents, these figures probably represent an upper bound on what respondents could explain or act on. Self-rated knowledge can also diverge from tested knowledge (Brucks, 1985), so the scores indicate perceived rather than demonstrated awareness.

The item-level pattern is more informative than the domain means. Respondents recognised the price and market logic of fast fashion (cheap inputs, outsourcing and employment creation) more readily than the human costs on which that logic depends; awareness of working conditions, effects on workers' families and the wage implications of cheap labour was among the lowest in the instrument. This pattern is consistent with the argument of Bick et al. (2018) that the social and health costs of fast fashion are displaced to producing regions and are therefore less visible to consumers: price is visible at the point of purchase, whereas conditions of production are not. The wording analysis (Section 5.6) indicates that part of the market-mechanics advantage may be an artefact of question format. However, the low labour scores do not appear to depend on it.

Low awareness of the transition costs faced by sustainable producers (36.5%) is also notable. Evidence that sustainable firms face higher costs and lower profitability (Meskini et al., 2024) helps to explain why sustainable clothing is more expensive. Consumers unaware of these costs may interpret price premiums as profiteering or greenwashing, a concern raised by Lu et al. (2022); this interpretation is speculative and was not tested.

6.3 Domains are empirically entangled

E1 predicted that environmental and sustainability awareness would exceed social and economic awareness. The overall test was significant in the full sample, but the effect was negligible, no pairwise difference survived correction, and the result disappeared when respondents aged 15–18 were excluded. Domain scores also correlated strongly, and α across all 42 items was .985. Three explanations are plausible. Awareness of fast fashion may be a single general disposition, with people who follow the issue learning about its facets together. The pattern may also reflect response style, including acquiescence and common-method variance in a single-source, single-format survey (Podsakoff et al., 2003). Finally, the sustainability and environmental blocks overlap in content (Section 4.4), which inflates their correlation by design. The data cannot separate these

explanations, but all three caution against treating the four domains as distinct constructs. For this reason, the combined environmental–sustainability score (Section 5.1) is the more defensible unit of interpretation, and a three-domain structure (economic, environmental–sustainability and social) that mirrors the triple bottom line is recommended for future versions of the instrument.

6.4 Intergenerational patterns

Gen Z respondents scored higher than older respondents across all domains, with the largest gap in social impacts ($d = 0.49$). The direction is consistent with greater exposure of younger cohorts to sustainability content on social media (Vladimirova et al., 2024), but the study cannot confirm it. With 14 Gen Z respondents, the power to detect a medium effect was about 35%. The Gen Z group is also confounded with life stage. Every student in the sample was Gen Z, and no older respondent was a student, so any difference could reflect current exposure to education rather than generational membership. In addition, the two groups were unbalanced (14 vs 38), and the older group combines respondents from several generations, which further limits what the comparison can show.

The age-band breakdown adds a further qualification. Respondents aged 50 and above scored nearly as high as Gen Z, and the lowest scores were in the 31–50 age range. This non-monotonic pattern rests on very small subgroups ($n = 4$ and 9) and is not statistically supported. However, it suggests that a simple younger-versus-older narrative may not describe awareness well. Possible explanations this study cannot test include differences in time available to follow the issue, occupational exposure, and self-selection into the survey. Larger, balanced samples across age bands are needed to examine these possibilities.

The qualitative data also show an intergenerational difference in how respondents think Gen Z should be reached. Nearly all Gen Z respondents (13 of 14) proposed social media, whereas older respondents more often proposed formal education and cost-per-wear framing. This difference is exploratory, but it suggests that intervention designers and their intended audience may favour different channels.

6.5 What respondents propose

Respondents across age groups agreed that social media is a key channel for Gen Z. This creates tension, because social media also accelerates the trend cycles that drive fast-fashion consumption (Vladimirova et al., 2024); awareness content must compete on the same platforms as the trends it criticises. Some proposals point to more specific, testable interventions. Cost-per-wear framing converts an abstract sustainability message into a personal economic one, consistent with Long and Nasiry's (2022) finding that consumer education which raises the value placed on quality has a long-term environmental benefit. Experiential exposure, such as visits to polluted rivers, landfills or artisan communities, targets precisely the impacts respondents knew least about. Moreover, swap initiatives were popular, but Peleg Mizrachi and Sharon (2025) caution that secondhand buying can supplement rather than replace new purchases.

The commitments respondents made were mostly low-cost and individual: telling others, buying less and reusing, with few structural actions named. This mirrors the gap between knowledge and behaviour described by Kollmuss and Agyeman (2002) and suggests that awareness efforts may need to be paired with easy, concrete routes to action. Because commitments are statements of intent, they cannot be taken as evidence of behaviour.

7. IMPLICATIONS

The implications below are based on descriptive patterns in a small sample and should be read as suggestions for practice and research, not as evidence-based prescriptions.

For educators and campaigners. Awareness efforts could prioritise the least-recognised impacts: labour conditions, effects on workers' communities, the fossil-fuel basis of synthetic fibres and the costs of sustainable production, potentially linked to the cost-per-wear logic that several respondents found intuitive. Because low awareness was observed across age groups and older respondents themselves proposed ways to reach Gen Z,

intergenerational formats (for example, family or community programmes) may be worth evaluating alongside youth-focused social media content.

For brands and policymakers. Several respondents asked for point-of-sale information, such as garment tags or platform disclosures, which would address the visibility gap suggested here. Kiran (2025) cautions that sustainability standards need to reflect local Indian manufacturing conditions rather than imported definitions.

For researchers. Domain-level averages concealed most of the useful variation in this study. Future instruments should measure awareness at the level of specific impacts, use a consistent stem and response format, consolidate overlapping sections into a single environmental–sustainability domain, and pair self-ratings with objective knowledge questions.

8. LIMITATIONS

The findings should be interpreted in light of several limitations arising from the study's scope and design.

Sample size and statistical power. The sample comprised 52 respondents, of whom 14 were Gen Z and only four were aged 31–40. Power to detect a medium difference between Gen Z and older respondents was about 35%, so non-significant age-group comparisons are inconclusive, and patterns in the smallest subgroups cannot be interpreted. The groups were also unbalanced: Gen Z respondents made up just over a quarter of the sample, and the older group combined three age bands spanning more than one generation.

Sampling and generalisability. Respondents were recruited through personal networks and onward sharing, and the number of people who received the link is unknown, so no response rate can be calculated. This recruitment method likely attracted people already interested in the topic, which may have biased awareness upward. Snowball sampling also tends to recruit people similar to the initial contacts. The sample was mostly female, highly educated and resident in the Delhi-NCR region (80.8%), and consumers from other regions of India, smaller towns and rural areas were barely represented; no respondent reported a household income below ₹50,001 a month, and 42.3% did not report income. The results, therefore, do not generalise to Gen Z, older generations, or Indian consumers more broadly.

Age and generational measurement. The study was originally designed to survey Gen Z, and the intergenerational framing reflects the achieved sample rather than a sampling plan; age groups were not recruited to be comparable. Age was recorded in bands that align only approximately with generational boundaries, and no respondent was recorded in the 27–30 band, leaving a gap between the Gen Z and older groups. Because the data are cross-sectional, generational, age and period effects cannot be separated, and Gen Z membership is confounded with student status.

Measurement. Awareness was self-reported and may be affected by social desirability or overclaiming, and self-rated knowledge is not equivalent to objective knowledge (Brucks, 1985). The survey included no objective knowledge test or behavioural measure, and stated commitments reflect intentions rather than behaviour. The sustainability and environmental blocks overlap in content, which weakens the discriminant validity of these two domains; three items were duplicated; and two stem formats were mixed, with direct-question items receiving higher mean scores than graded items. Factor structure could not be tested at this sample size, and very high α values suggest redundancy rather than strong measurement. The questionnaire was presented in English, although 55.8% of respondents reported Hindi as their primary language.

Data quality and analysis. Four respondents straightlined, although results were robust to their exclusion. The commitment question appears to have been added after data collection began, and some open-ended answers may have been pasted from other sources. A single analyst coded open-ended responses using keyword assistance, and inter-coder reliability could not be assessed, so the qualitative counts reflect one coder's judgement and are approximate. Several analyses (the labour-versus-consumer-culture contrast, the wording analysis, and the qualitative group comparison) were not planned and are exploratory. Finally, because the sample included nine respondents aged 15–18, the results depend in part on these responses; the sensitivity

analysis shows that excluding them removes the domain-difference result and leaves only five Gen Z respondents.

9. FUTURE RESEARCH

Future studies should address this exploratory survey's limitations in three main ways. First, they should recruit a larger, purpose-built sample. Achieving 80% power to detect a medium effect (d = 0.5) between two groups requires roughly 64 respondents per group under conventional assumptions (Cohen, 1988), and a larger sample would also permit confirmatory factor analysis of the instrument. Recruitment should extend beyond the Delhi-NCR region, using quota or stratified sampling across several regions of India, urban and non-urban areas and income groups, so that regional and socio-economic differences can be examined. Quotas for each age band should ensure a balanced representation of Gen Z and older consumers, and exact age or birth year should be recorded so that respondents can be assigned to generations precisely.

Second, the questionnaire should be refined before wider use. Consolidate overlapping sustainability and environmental items into one domain, remove duplicated items, and use a consistent stem and response format across all items. The revised instrument should be pretested, offered in respondents' primary languages, and should pair self-ratings with objective, knowledge-based items, such as true/false or multiple-choice questions on specific impacts, so that perceived and actual awareness can be compared. Open-ended responses should be coded by at least two independent coders, with inter-coder reliability reported.

Third, future studies should examine how awareness relates to purchasing behaviour and to preferences for sustainable fashion. Within the theory of planned behaviour (Ajzen, 1991), for example, awareness could be modelled as an antecedent of attitudes, subjective norms and intentions, which in turn predict reported purchasing of fast and sustainable fashion. Longitudinal or repeated cross-sectional designs are needed to distinguish generational from age-related differences.

10. CONCLUSION

This exploratory survey of 52 respondents across age groups found moderate self-reported awareness of fast fashion's impacts, with no domain reaching the 'aware' level. Awareness was uneven at the item level: respondents recognised the industry's cost and employment logic more readily than the labour and community harms on which that logic depends, or the costs of shifting to sustainable production. Differences between impact domains were negligible and not robust, and the domains behaved largely as a single general disposition.

Gen Z respondents scored somewhat higher than older respondents in every domain, but the differences were not statistically significant; the comparison was underpowered, and respondents aged above 50 scored nearly as high as Gen Z. The study therefore does not support the claim that Gen Z is more aware than older consumers; it shows only that this possibility merits a properly powered test. Respondents of all ages saw social media as the main route to Gen Z and also proposed cost-per-wear framing, direct exposure and point-of-sale transparency. Future work should prioritise larger samples that are balanced across age groups and drawn from several regions of India, a refined and validated instrument that pairs self-ratings with objective knowledge items, and measures of purchasing behaviour and sustainable fashion preferences alongside awareness.

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