Research Article

Students' Level of Awareness on the Waste Contribution of the Fast Fashion with Their Clothing Consumption Behavior

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Abstract: The accessibility and convenience of purchasing fashion items have increased due to continuous manufacturing and high demand. The fast fashion industry has capitalized on the latest trends by offering cheap, affordable, yet disposable items, contributing to global pollution through solid waste and wastewater. This study aims to assess (a) students' level of awareness regarding the waste contribution of the fast fashion industry, (b) their clothing consumption behavior concerning purchases and utilization, (c) their waste disposal practices, and (d) the relationship between clothing consumption behavior and their level of awareness. The study employs systematic random sampling to determine an appropriate sample size from the student population, resulting in 104 student respondents for the adapted survey. Goodman and Kruskal's Gamma analysis assesses the association between clothing consumption and awareness. The results indicate that the students know about the industry's wastewater and solid waste contribution. However, the study also reveals a negligible to moderate relationship between clothing consumption, including the frequency of purchases and utilization, and their overall awareness. This suggests that despite being highly aware of the environmental issues associated with the fast fashion industry, students continue to support and purchase products from this sector.

Keywords: Consumption Behavior; Disposal; Environmental Concern; Wastewater; Solid Waste Contribution.

1. Introduction

How people dress is often associated with their personalities and social status, so they frequently stress about their appearance more than anything else. Social media and advertisements significantly influence fashion choices, as celebrities and influencers showcase fashionable attire to attract large audiences, leading to new fashion trends [1], [2]. As a result, shopping for new clothes, shoes, bags, and accessories has become a natural aspect of most teenagers and young adults' lives. A survey conducted by the NPD Group [3] revealed that the majority of consumers discover the latest fashion brands and trends through Facebook (41%), Instagram (35%), and Pinterest (21%). Consequently, brands produce more apparel collections than ever, enabling consumers to keep up with the rapidly changing fashion trends.

Since the beginning of the industrial revolution, the production of items has become faster and cheaper, with machines taking over manual human labor [4]–[6]. During this time, the fashion and clothing industry experienced continuous growth, responding to demands and trends at a given time. According to Vilaca [7], fabrics, clothing, and textiles became integral to the industrialized system, with the capability to expand, compete, and innovate.

Significant growth in the fashion industry has been evident over the years. Fiber production alone has nearly doubled from 7.6 kg of fiber per person in 2000 to 13.8 kg

per person in 2018. Moreover, based on Statista, the number of apparel consumers is projected to increase from 2,135.8 million users in 2022 to 2,622 million in 2025. This expansion directly relates to adopting "fast fashion" [8].

As the fast fashion industry rapidly grows due to its affordability, accessibility, and ability to follow shorter fashion trend cycles, its environmental impacts have become increasingly visible. However, consumers' perspectives on this issue are rarely discussed. While separate studies exist regarding the effects of the fast fashion industry on the environment and the factors influencing people's purchasing decisions in the fashion industry, it remains unclear how much fast fashion consumers know about the environmental consequences of the industry and whether such awareness would influence their purchasing attitude towards it. Addressing this gap, this research aims to determine consumers' level of awareness of the waste contribution of the fast fashion industry and its effect on their clothing consumption behavior. Specifically, the study aims to investigate (1) the clothing consumption behavior of the respondents; (2) how they dispose of their clothes; and (3) their level of awareness regarding the environmental impact of fast fashion.

2. Literature Review

2.1. Fast Fashion

Fast fashion is characterized by the rapid production and disposal of clothes, in contrast to slow style, prioritizing quality and long-term usage [9]. It involves the mass production of cheaply made clothing that quickly cycles through stores, capitalizing on the latest fashion trends worldwide. Compared to other options, fast fashion offers a wide range of products that mimic those found in high-end stores, granting consumers access to more apparel at a lower price. However, the continuous accumulation of cheap garments made with low-quality materials has turned clothing into a disposable item, as ongoing reductions in production costs enable fashion enthusiasts to buy more clothing and follow trends at an affordable price.

Research and Markets [10] report that Zara, H&M, Forever21, and UNIQLO are among the top brands in the fast fashion industry, known for releasing multiple collections of apparel to cater to the fast-paced fashion trends in the market. In addition to their lower prices, these brands have improved accessibility by establishing online stores and joining e-commerce platforms. However, as the term suggests, fast fashion is associated with rapid changes, leading people to purchase clothes frequently and wear them only five to eight times before discarding

them to buy new ones, resulting in millions of discarded clothes yearly. The World Economic Forum estimates that the amount of clothing produced annually has doubled since the beginning of the decade due to decreased garment prices and increased clothing demand, but only a tiny portion of this production is recycled [11].

2.2. Clothing Consumption Behavior

According to Fan [12], several variables primarily influence consumer behavior when it comes to clothing, including quality, price, availability of clothes, and social influence. However, the environmental aspect of clothing production is seldom or never considered. Research indicates that most consumers do not prioritize sustainability in purchasing clothing [13]. A study by Paco et al. [9] revealed that consumers focus more on fashion trends and material composition than environmental factors. This is especially true for self-conscious individuals drawn to clothes based on design and styles without fully realizing the quantity of clothes they own. As a result, the fast fashion industry, known for its short turnaround time [8], not only leads to an increase in clothing consumption but also contributes to a rise in post-purchase disposal of clothes.

Bick et al. [14] reported that 85% of the 80 billion pieces of new clothes produced are solid waste after use, most ending up in landfills. Common reasons for clothes disposal include fit issues or inadequate size, boredom with the clothing, outdated style, lack of storage space, and wear-and-tear [8].

2.3. Consumers' Awareness

Previous research has indicated that consumers' environmental concerns influence their intention to purchase sustainable clothing, as those with more significant environmental problems tend to have a more positive attitude towards environmentally friendly products [15]. However, studies discussing slow and fast fashion stores reveal that consumers are unaware of their sustainability practices [9]. This lack of awareness is primarily due to limited information shared with the public regarding the production details, particularly the life cycle assessment (LCA) of clothes. The life cycle assessment of fast fashion illustrates its environmental impact at each stage, including raw material production and acquisition, fabrication, transportation, use, and disposal of clothes or garments [16], [17]. Unfortunately, discussions about the environmental consequences of clothing production, distribution, consumption, and disposal often involve technical terms that regular consumers find difficult to comprehend [13]. Moreover, some companies may engage in greenwashing as part of their marketing strategy, misleading customers into buying products that do not meet green and sustainable criteria [18]. Despite its

detrimental environmental effects, these factors have contributed to the growth and demand for fast fashion.

2.4. Environmental Impact

The fashion industry's adverse environmental impacts are evident even before clothing is sold, as the production process is resource-intensive [8], [19], [20]. The fast fashion industry significantly contributes to greenhouse gas emissions (from burning fossil fuels for electricity used in manufacturing and laundering), water consumption (from dyeing textiles), and water and land pollution [21]. Recent research by Quantis [22] identifies the following processes as significant contributors to greenhouse gas emissions in garment production: dyeing and finishing (36%), yarn preparation (28%), and fiber production (15%). A clothing consumption study in Sweden reveals that cotton and fiber production accounts for approximately 88% of water scarcity [3], [17]. The high percentage of environmental impact from these processes results from their heavy reliance on energy-intensive processing and fossil-based energy sources. Moreover, producing synthetic fabrics like polyester and nylon involves petrochemicals, contributing to greenhouse gas emissions and pollution. These petrochemicals may include heavy metals like cobalt, posing a significant environmental threat if discharged untreated [23].

2.5. Wastewater and Microplastic Contribution

The fashion industry's apparel production consumes a substantial volume of water, with an estimated 100-150 liters of water used for every kilogram of textile material and dyeing 28 billion kilograms of textiles requiring around 5 trillion liters of water [24]. Consequently, the industry's water usage for textile and clothing production leads to vast amounts of wastewater discharge. Water pollution occurs due to the production of dyes, which involve heavy metals such as mercury, chromium, cadmium, lead, and arsenic [25]–[27]. Additionally, the fashion industry contributes to agricultural wastewater, particularly in cotton farming, where large amounts of water are used for irrigation, and fertilizers and pesticides are utilized to maximize cotton yield [28], [29].

The fast fashion industry not only consumes a significant amount of water but also contributes to water pollution, accounting for approximately 20% of global wastewater, as the United Nations Environment Program reported. For example, in Nigeria, the textile industry is known to cause water discoloration due to the release of untreated effluents that exceed standard limits for pH level, turbidity, color, total suspended units, and chemical oxygen demand [30].

Furthermore, the fast fashion industry is a significant source of microplastics found in freshwater systems. Textile effluent discharge into rivers contributes to water contamination [31]. Polyester, a widely used synthetic fabric due to its cost-effectiveness, lightweight nature, and durability [32], significantly contributes to microplastic pollution. When clothes made from polyester are laundered, they shed microfiber plastics that end up in sewage treatments [33]. Studies have found that washing garments can release over 1,900 fibers per wash, indicating the substantial contribution of washing machines to the presence of microfiber plastics in marine habitats.

Glitters and sequins sewn on fabrics are also considered primary microplastics in water bodies [34]. Henry et al. have documented various impacts of microfibers, including physical, chemical, and biological effects and their potential effects on human health [35]. For instance, ingesting these microplastics may lead to false satiation and gastrointestinal blockages.

2.6. Solid Waste Contribution

Textiles and plastics significantly contribute to problematic solid waste worldwide, mainly from discarded clothes [36]–[39]. This waste category includes non-biodegradable clothing accessories such as zippers, snap fasteners, acrylic and shell buttons, and polyester and acrylic fibers used in socks, sweaters, and blankets. Unfortunately, most textile wastes end up in landfills rather than being recycled, with the recycling rate reported to be only 15% in the United States [33]. As discarded clothing decomposes, it can leach toxic chemicals and dyes into the environment [40]–[42]. The recycling rate of discarded clothes was reported to be less than 10% [43]. A similar trend is observed in the Philippines, with 65% of Filipino adults discarding their clothes within a year, based on data from YouGov Omnibus research in 2017 [44].

The fashion industry operates on a linear model with three main stages: take (raw material harvesting), make (garment production), and waste (wearing and eventual disposal of clothing) [45]. This linear approach contrasts the ideal circular economy, as fast fashion neither maximizes the service provided by its material and energy flows nor limits them to what nature can sustain [8], [46]–[48]. Consequently, the high volume of clothing purchases and disposals, particularly in fast fashion, poses significant environmental risks. Notably, environmental concerns have not only arisen among consumers but also targeted fashion brands, which have faced criticism for unsustainable practices, including discarding unsold merchandise and contributing to landfills with surplus garments after releasing multiple collections within a year.

3. Material and Methods

3.1. Research Design

The researchers used the quantitative research design as their research design to collect quantifiable data and process it using statistical analysis. This shows the relationship between the variables to create a generalization. Quantitative research design can collect information from respondents using structured methods such as questionnaires, surveys, or polls. The data that will be gathered is reliable and unbiased as it is presented in numbers, unlike observation or interviews. Also, this kind of research design can cater to a broad scope of data collection.

3.2. Participants

The researchers used systematic random sampling to pick the respondents that will participate in the study. Using this method, the researchers can precisely represent the whole population without bias. The study was conducted on the Science Programs of College of Science students of Bulacan State University-Main Campus with a total of 906 students. One hundred fifty-one students came from the BS Environmental Science program, 467 from the BS Biology program, and 288 from the BS Food Technology program. The sample size was selected with a confidence level of 90% and a margin of error of 5%. After getting the sample size, the respondents were picked using Systematic Random Sampling.

The formula for Systematic Random Sampling:

$$k = \frac{N}{n} \tag{1}$$

where: k = number of intervals; N = size of the population; n = size of the sample.

3.3. Research Instrument

The researchers used questionnaires as the data collection instrument to gather needed data from the respondents. The questionnaire was used as it was convenient for both the researchers and the respondents. Past studies and publications were used as references to draft the questionnaire [12], [14], [49], [50].

Table 1. Interpretation of Cronbach's Alpha

Cronbach's Alpha	Interpretation
> 0.90	Excellent
> 0.80	Good
> 0.70	Acceptable
> 0.60	Questionable
> 0.50	Poor
< 0.50	Unacceptable

To effectively disseminate the questionnaires to the respondents, in-person and online surveys were utilized, specifically using google forms. Multiple choice and Likert scales were chosen for the survey questions to know the respondents' level of awareness.

The questionnaire comprises three sections: personal information, consumer behavior, and consumer awareness of the waste contribution of the fast fashion industry. Before dissemination, the reliability of the questionnaire was tested using Cronbach's Alpha Coefficient (α). A computed reliability coefficient greater than 0.70 indicates an acceptable internal consistency [51].

Table 2. Reliability Coefficients for The Set of Variables

Variables	Items (N)	Cronbach's Alpha
Clothing Consumption Behavior	30	0.747
Level of Awareness	15	0.905

The test results demonstrate that the questionnaire used to assess "Clothing Consumption Behavior" and "Level of Awareness" regarding the waste generated by the fast fashion industry is highly reliable. The Cronbach's Alpha values of 0.747 and 0.905 for the respective sections exceed the acceptable threshold of 0.70, indicating a strong level of internal consistency in the questionnaire. This suggests that the questionnaire consistently provides reliable measurements of consumer behavior and awareness regarding the environmental impact of the fast fashion industry. Researchers can confidently utilize this questionnaire as a dependable tool to gather data for their study, ensuring its effectiveness and accuracy.

3.4. Data Collection Procedures

The researchers obtained authorization from the dean of the College of Science at Bulacan State University through a formal letter, allowing them to survey students as respondents. The questionnaire was then disseminated to 104 participants, with 17 from the BS Environmental Science program, 54 from the BS Biology program, and 33 from the BS Food Technology program. Selected students were requested to complete the questionnaire with the assistance of the respective board members of each program, as well as the class mayors.

3.5. Data Processing and Statistical Analysis

The researchers utilized the Statistical Package for the Social Sciences (SPSS) for data processing and statistical analysis. Descriptive statistics were conducted to calculate the mean score of respondents' waste disposal habits and clothing utilization and to explore their demographic profile, including age, sex, year level, program, and monthly household income.

To investigate the relationship between respondents' awareness and the frequency of their clothing purchases, a one-way analysis of variance (ANOVA) was employed. The study used a specific scale to assess the likelihood of considering categories when purchasing and disposing of their clothes. The following scale was used to provide an interpretation of the respondents' awareness:

Table 3. Interpretation of Mean Values on Purchasing and Disposing Categories

Mean Range	Interpretation
1.00 – 4.00	Extremely Unlikely
5.00 – 6.00	Somewhat Unlikely
7.00	Somewhat Likely
8.00 – 10.00	Extremely Likely

Table 4. Reliability Coefficients for The Set of Variables

Mean Range	Interpretation
1.00 – 4.00	Low
5.00 – 6.00	Moderate
7.00	Almost High
8.00 – 10.00	High

In research or surveys, the level of awareness of respondents to a particular phenomenon or topic is commonly evaluated using an interpretation scale. An interpretation scale serves as a tool to convert the numerical values or scores of specific variables into distinct categories or levels of awareness, making it easier to comprehend and analyze the data.

Table 5. Interpretation of Goodman and Kruskal's Gamma

Goodman and Kruskal's Gamma	Interpretation
0.00 < 0.10	Negligible
0.10 < 0.20	Weak
0.20 < 0.40	Moderate
0.40 < 0.60	Relatively Strong
0.60 < 0.80	Strong
0.80 < 1.00	Very Strong

The relationship between students' awareness and clothing consumption was assessed using Goodman and Kruskal's Gamma (G or γ). A 95% confidence interval was utilized to determine the significance value. The null hypothesis is rejected if the calculated p-value is less than 0.05, implying a significant relationship between awareness and clothing consumption behavior. Conversely, if the p-value is more effective than 0.05, the null hypothesis is accepted, indicating that no critical relationship exists between the two variables. The significance value obtained from this analysis will help ascertain whether students' awareness level is meaningful to their clothing purchasing and utilization habits.

4. Result and Discussion

4.1. Demographics

The findings presented in this study are derived from the collected data and subsequent data analysis. These results have been interpreted and discussed in light of relevant literature to explore potential associations. The study focuses on various demographic factors influencing the respondents' awareness levels, such as age, sex, and monthly household income.

Table 6. Demographic Profile of Respondents

Variables	Range	Frequency (N=104)	Percentage
Age	18 - 21	90.00	86.50%
	22 - 25	12.00	11.50%
	26 - 29	1.00	1.00%
	Did not say	1.00	1.00%
Gender	Female	57.00	54.80%
	Male	43.00	41.30%
	I prefer not to say	4.00	3.80%
Household Average Monthly Income (Php)	Low-income (9,501-19,000)	21.00	20.20%
	Lower Middle Income (19,001-38,000)	32.00	30.80%

Variables	Range	Frequency (N=104)	Percentage
	Upper Middle Income (38,001-66,000)	19.00	18.30%
	Upper Income (66,001-144,000)	11.00	10.60%
	Rich (190,001 and above)	1.00	1.00%
	Low-income (9,501-19,000)	21.00	20.20%

The survey was conducted during the first two weeks of May 2023, with 104 students participating. Most respondents were 18-21, comprising 86.5% of the sample, 22-25 (11.5%), and 26-29 (1.0%), with one student not stating their age. In terms of gender distribution, the majority of respondents identified as female, accounting for 54.8% of the sample, while 41.3% identified as male, and four students preferred not to disclose their biological sex.

Regarding household average monthly income, most respondents belonged to the lower middle-income group, representing 30.8% of the total sample size. The following highest income groups were low income (20.2%), upper middle income (18.3%), upper income (10.6%), and only 1% reported being from a wealthy household.

4.2. Clothing Purchase

Figure 1 displays the frequency of clothing purchases among the respondents. Most respondents (36%) reported buying clothes once every 2-3 months, followed by 35% who made purchases 1-3 times a year and 23% who bought clothes 1-3 times a month. Only two respondents indicated purchasing clothes 1-3 times a week, while five said they never buy clothes. These findings suggest that the respondents generally do not engage in frequent clothing purchases, with a significant portion opting for less frequent buying patterns.
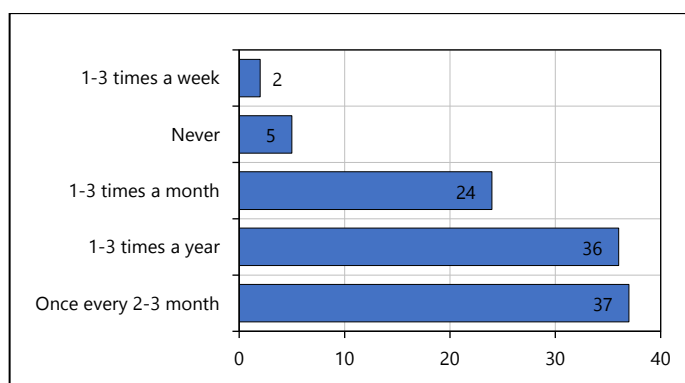
Figure 1. Frequency of Students' Clothing Purchase under the Fast Fashion Industry.

Figure 2 illustrates the percentage of preferred clothing stores among students. The options provided include examples of online stores such as Shopee, Lazada, Zalora, Shein, and others, while the physical stores' category encompasses options such as Malls, Public Markets, Tiangge, Ukay-ukay, etc.
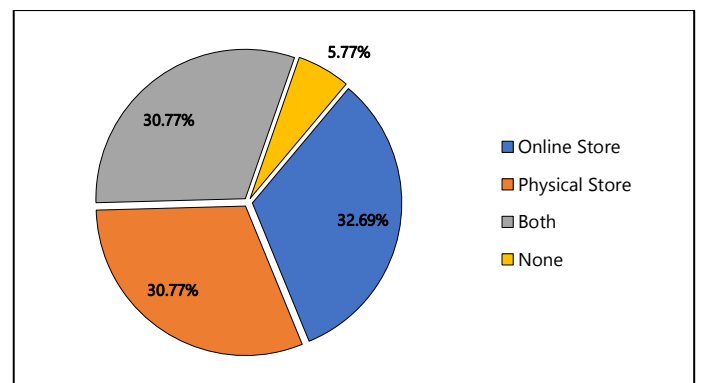
Figure 2. Percentage of Clothing Stores Preferred by Students.

According to the data, online stores emerged as the favored type of clothing shopping destination among students, accounting for 32.69% of responses. Physical stores closely followed, capturing 30.77% of preferences. Additionally, 30.77% of students indicated considering both types of stores when making clothing purchases, while 5.77% chose neither of the options.

These results strongly indicate that many students prefer online rather than physical stores when buying clothing products. This trend aligns with the increasing popularity of e-commerce, which has significantly contributed to the growth of the fast fashion industry. Many clothing companies now opt to sell their products online, catering to the preferences and convenience of young consumers, including students.

Table 7. Rank Score Test on the Properties to Consider when Buying Clothes.

Category	Score	Rank	Mean	Interpretation
Sustainability	956	1	9.56	Extremely Likely
Fit	917	2	9.17	Extremely Likely
Comfort	912	3	9.12	Extremely Likely
Quality	904	4	9.04	Extremely Likely
Design	895	5	8.95	Extremely Likely
Durability	880	6	8.89	Extremely Likely
Price	879	7	8.79	Extremely Likely
Availability	843	8	8.43	Extremely Likely
Social Influence	626	9	6.26	Likely

Respondents strongly preferred ("extremely likely") to consider certain factors when buying clothes, such as quality, durability, price, fit, comfort, availability, sustainability, and design. They also indicated a likelihood of considering social influence in their clothing purchases. Each factor was scored and ranked accordingly, with sustainability receiving the highest score, making it the top consideration for respondents. Surprisingly, social influence received the lowest score, suggesting it negatively impacts their decision-making.

This result contradicts a previous study claiming that most consumers do not prioritize sustainability in clothing purchases [13]. The current study reveals that, at least among the student respondents, sustainability is a significant and influential factor in their clothing purchasing decisions. This finding underscores young consumers' growing awareness and concern regarding sustainability and its implications for the fashion industry.

**Table 8.** Rank Score Test on the Reasons for Buying Clothes.

Category	Mean	Interpretation
Replacing Old Clothes	7.51	Extremely likely
As Gift	6.90	Likely
Hobby	5.20	Somewhat unlikely
For Collection	5.01	Somewhat unlikely

Table 8 shows that the respondents are highly inclined to purchase new clothes to replace old ones, as indicated by the highest mean value of 7.51. Additionally, they exhibit a significant likelihood of buying clothes as gifts, with a mean of 6.90. However, purchasing clothes for their hobby or as part of a collection appears less probable, as evidenced by the low mean values of 5.20 and 5.00, respectively.

4.3. Clothing Utilization

Figure 3 illustrates the frequency of clothing usage among the respondents after purchase. Out of the respondents, 66 individuals (63.46%) reported using their clothes more than three times. Additionally, 16 respondents (15.38%) said they use their clothes precisely thrice. Nine participants (7.6%) used their clothes twice, while five respondents (4.8%) reported using them only once. Finally, eight respondents (8.65%) chose not to provide an answer.

These findings suggest that many respondents try to use their clothes multiple times after purchase, aligning with the theme of sustainability and responsible clothing consumption behavior. The results also reflect a smaller percentage of individuals who may tend to wear their clothes less frequently or choose not to disclose their clothing utilization habits.
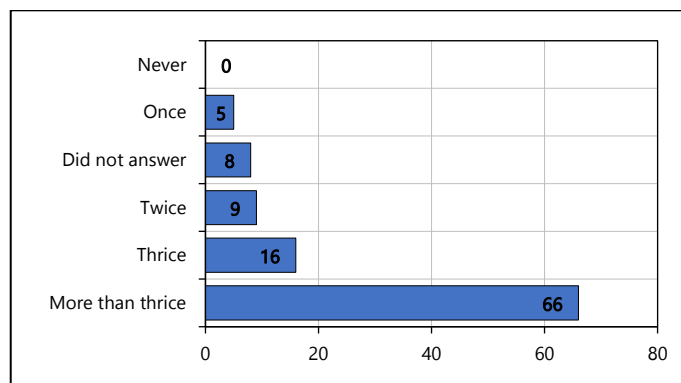
Figure 3. Frequency of Students' Clothing Usage.
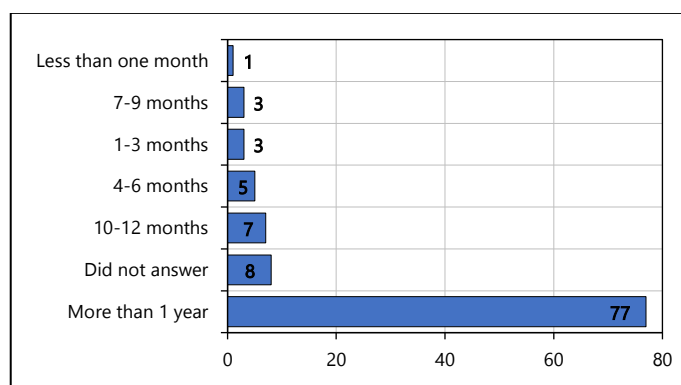
Figure 4. Clothing Storage Period Before Discarding.

Figure 4 presents the duration for which students keep their clothes before discarding them. Most respondents, 77 (74.03%), reported keeping their clothes for over a year. Seven participants (6.73%) stated that they kept their clothes for 10-12 months, while five respondents (4.80%) reported 4-6 months. Additionally, three respondents (2.88%) indicated a period of 1-3 months, and the same number (2.88%) reported 7-9 months. Only one respondent (0.96%) stated they kept their clothes for less than one month. Moreover, eight participants (7.69%) chose not to provide an answer.

This behavior aligns with sustainable practices, as it indicates a willingness to prolong the life of their clothing items and reduce unnecessary waste. On the other hand, a small fraction of respondents reported shorter durations of clothing retention, possibly indicating a preference for frequent wardrobe updates or limited clothing usage before disposal.

4.4. Clothing Disposal

The respondents were asked to rate their likelihood of using various practices when discarding unused clothes. Based on the responses, they are extremely likely to give their new clothes to their family members or repurpose their unused clothes into cleaning rags. However, the rest of the practices range from extremely unlikely to somewhat unlikely. Specifically, the respondents are

unlikely to give their unused clothes to their friends or donate them to charity. Additionally, most are unlikely to sell their unused clothes or dispose of them in trash bins. Notably, discarding unused clothing in bins has the lowest mean rating of 3.45.

Table 9. Mean and Interpretation on the Clothing Disposal Practices among Students

Category	Mean	Interpretation
I give them to members of my family	8.35	Extremely likely
I give them to my friends	5.32	Somewhat unlikely
I donate them to charity	5.95	Somewhat unlikely
I sell them	3.47	Extremely unlikely
I use them as cleaning rags	7.49	Extremely likely
I throw them into trash bins	3.45	Extremely unlikely

Considering the environmental impact of clothing disposal, the respondents' inclination to give their clothes to family members and repurpose them as cleaning rags suggests a positive attitude towards sustainable practices. However, the low likelihood of donating or selling their unused clothes and the inclination to discard them in trash bins indicate room for improvement in promoting more environmentally friendly disposal options.

Table 10. Mean and Interpretation on the Clothing Disposal Practices among Students

Category	Mean	Interpretation
Shortage of space	6.16	Likely
Unfashionable items	5.53	Somewhat unlikely
Defects	6.95	Likely

Category	Mean	Interpretation
To make money	4.22	Somewhat unlikely
To help others	6.62	Likely

Based on the responses, the primary reason for disposing of clothes is inadequate size, with the highest mean value of 7.66, followed by defects, the intention to help others, and a shortage of space, with mean values of 6.95, 6.62, and 6.16, respectively. These findings are consistent with the results of a previous study, which also discovered that inadequate fit or size is one of the most common reasons for discarding clothes [50]. As mentioned earlier, the fast fashion industry's cheap production may explain the defects identified by respondents.

Conversely, the respondents are somewhat unlikely to discard clothes due to them being unfashionable or to make money. This aligns with their previous responses, as they were also extremely unlikely to sell their unused clothes.

4.5. Level of Awareness on Waste Contribution of the Fast Fashion Industry

The level of awareness regarding the solid waste contribution of the fast fashion industry is very high, particularly concerning the degradation of clothing accessories and clothes disposal in landfills, with mean values of 8.54 and 8.28, respectively. Furthermore, respondents have shown relatively high awareness levels regarding other aspects of the industry's solid waste contribution, including the percentage of disposed clothes, decomposition of acrylic fibers, chemical leaching on soil, greenwashing practices, non-biodegradable polyesters, and the linear fashion model of the clothing process.

Table 11. Level of Awareness on the Solid Waste Contribution of the Fast Fashion Industry

Statements'	Description	Mean	Std. Dev.	Interpretation
S8	Clothes accessories such as zippers, snap fasteners, and acyclic and shell buttons are hard to degrade.	8.54	1.85	Very High
S9	Most clothes end up in landfill or get burnt.	8.28	2.18	Very High
S10	Clothes follow a linear fashion model, i.e., used clothes are disposed of in landfills instead of recycled into new clothes.	7.59	2.32	High
S11	Clothes made of polyester, a type of plastic, are cheaper but non-biodegradable.	7.53	2.43	High
S12	Textile companies marked their clothing products as environmentally friendly without following any criteria that would make it so.	7.30	2.44	High
S13	Most sweaters and socks are made of acrylic fibers, a type of plastic that takes up to 100 years to decompose in the soil thoroughly.	7.24	2.75	High
S14	Clothing waste releases chemicals into the soil when dumped.	7.25	2.84	High
S15	Only 15-20% of disposed clothes are recycled.	7.00	2.60	High

4.6. Relationship of Clothing Consumption Frequency and Level of Awareness on Wastewater Contribution of Fast Fashion Industry

To examine whether there is a significant relationship between the frequency of clothing purchases and the respondents' awareness level of the wastewater contribution of the fast fashion industry, the Goodman-Kruskal gamma was employed using the SPSS program.

Table 12. The Gamma Analysis of Clothing Purchase Frequency and Wastewater Contribution of the Fast Fashion Industry

Statements'	Symmetric Measures	
	Value	Approx. Sig.
S1	-0.043	0.667
S2	-0.130	0.220
S3	-0.122	0.211
S4	-0.080	0.423
S5	0.017	0.877
S6	-0.023	0.805
S7	-0.015	0.895

The options for the frequency of clothing purchases were categorized with the following values: 1 for "1-3 times a week," 2 for "More than three times a week," 3 for "1-3 times a month," 4 for "Once every 2-3 months," 5 for "1-3 times in a year," and 6 for "Never." The results, derived from 101 responses, were presented in Table 6. It is important to note that three students did not respond to questions about their level of awareness.

Interpreting the gamma values using the rule of thumb proposed by Rea and Parker [52], it is evident that the frequency of clothing purchases has a negligible to a weak relationship with the awareness level regarding the waste contribution of the fast fashion industry. Moreover, the p-values obtained for assessing this relationship are more significant than the critical p-value of 0.05. These findings indicate no statistically significant relationship between the frequency of clothing purchases reported by the respondents and their level of awareness concerning wastewater contribution in the fast fashion industry.

Table 13. The Gamma Analysis of Clothing Purchase Frequency and Solid Waste Contribution of the Fast Fashion Industry

Statements'	Symmetric Measures	
	Value	Approx. Sig.
S8	-0.048	0.674
S9	-0.03	0.797
S10	0.051	0.641

Statements'	Symmetric Measures	
	Value	Approx. Sig.
S11	-0.139	0.198
S12	-0.022	0.835
S13	-0.111	0.252
S14	-0.236	0.021
S15	-0.013	0.903

Likewise, the analysis of the relationship between clothing purchase frequency and awareness level on the solid waste contribution of the fast fashion industry reveals associations ranging from negligible to moderate, with the highest gamma value of 0.236 observed in Statement 14, which specifically addresses the chemicals released from clothing waste into the soil. Furthermore, Statement 14 is the only one with a p-value of 0.021, less than the significance level of 0.05.

The statistically significant p-value for Statement 14 suggests a significant relationship between clothing purchase frequency and awareness regarding the chemicals released from clothing waste into the soil. However, it is essential to note that the rest of the statements concerning the solid waste contribution of the fast fashion industry do not exhibit significant relationships with clothing purchase frequency.

Table 14. The Gamma Analysis of Clothing Utilization Frequency and Wastewater Contribution of Fast Fashion Industry

Statements'	Symmetric Measures	
	Value	Approx. Sig.
S1	0.056	0.632
S2	0.252	0.034
S3	0.072	0.541
S4	0.374	0.001
S5	0.245	0.041
S6	0.162	0.148
S7	0.334	0.003

The frequency of clothing utilization was categorized with the following values: 1 for "Once," 2 for "Twice," 3 for "Thrice," 4 for "More than thrice," and 5 for "Never." When comparing the clothing utilization frequency to the clothing purchase frequency, it is evident that the former exhibits higher gamma values, indicating relationships ranging from negligible to moderate.

Statement 1 (γ = 0.056) and Statement 3 (γ = 0.072) demonstrate gamma values below 0.1, signifying a negligible relationship between clothing utilization and awareness level of wastewater contribution in the fast fashion industry. Meanwhile, Statement 6 (γ = 0.162)

exhibits a weak relationship, and Statements 4 (γ = 0.374), 7 (γ = 0.334), 2 (γ = 0.252), and 5 (γ = 0.245) indicate a moderate association.

The generated p-values for Statements 1, 3, and 6 exceed the critical p-value of 0.05, indicating non-significant relationships. Conversely, Statements 2, 4, 5, and 7 present p-values lower than 0.05, signifying significant relationships between the respondents' clothing utilization frequency and their level of awareness of wastewater contribution in the fast fashion industry.

The findings suggest that some statements (1, 3, and 6) have negligible relationships, while others (2, 4, 5, and 7) have significant associations between clothing utilization frequency and awareness level of wastewater contribution in the fast fashion industry.

Table 15. The Gamma Analysis of Clothing Utilization Frequency and Solid Waste Contribution of the Fast Fashion Industry

Statements'	Symmetric Measures	
	Value	Approx. Sig.
S8	0.360	0.004
S9	0.398	0.001
S10	0.313	0.006
S11	0.207	0.082
S12	0.229	0.053
S13	0.103	0.350
S14	0.075	0.521
S15	0.192	0.099

Examining the relationship between clothing utilization frequency and awareness level on the solid waste contribution of the fast fashion industry also reveals associations ranging from negligible to moderate, with Statement 14 having the lowest gamma value of 0.075. Additionally, Statement 13 and Statement 15 show a weak relationship with clothing utilization frequency, having gamma values of 0.103 and 0.192, respectively. On the other hand, Statement 9 exhibits the highest gamma value of 0.398, followed by Statement 8, 10, 12, and 11 with gamma values of 0.36, 0.313, 0.229, and 0.207, respectively.

However, it is crucial to note that the p-values for Statements 11, 12, 13, and 14 exceed the critical p-value of 0.05. This indicates that the relationship between clothing utilization frequency and awareness of these statements is not statistically significant.

5. Conclusion

The results indicate that students purchase fast-fashion clothes once every 2-3 months, use them thrice, and keep them for over a year. Reasons such as inadequate size,

defects, and limited space lead them to give their old clothes to family members or use them as cleaning rags. The study also found that students are less inclined to sell or discard unused garments. Students' awareness of the fast fashion industry's waste contribution, concerning wastewater and solid waste, varies from moderate to very high. However, the study reveals that clothing consumption behavior is not associated with their level of awareness of the fast fashion industry's waste contribution. The purchase frequency was found to have a negligible to the weak and insignificant relationship with awareness, while clothing utilization showed a mostly moderate and almost significant relationship with the level of awareness. Hence, there is no direct relationship between clothing consumption behavior and respondents' awareness level. Nonetheless, the research findings establish a positive relationship. Respondents rarely buy clothes, think about sustainability, or dispose of unused clothing in an environmentally friendly manner, indicating their heightened awareness of the fast fashion industry's waste contribution.

Since most respondents do not buy and wear clothes frequently, more than three times, clothing production could be slowed to reduce waste, particularly during manufacturing. An ample supply of clothing makes them less expensive to sell in the market, and disposal becomes the responsibility of the consumers. Furthermore, despite being rarely discussed or reported, respondents seem aware of the fast fashion industry's contribution to waste. As a result, their awareness of global environmental problems may also be high. Hence, environmental advocates are encouraged to move forward with developing action plans involving fieldwork rather than educating people about topics with which they are likely already very familiar.

Acknowledgments

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