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Domestic Plastic Consumption Patterns: A Data-Informed Sociological Analysis of Education and Behaviour Among Homemakers

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Abstract

In the contemporary landscape characterized by escalating plastic usage, this study embarked on an in-depth exploration of the relationship between demographic characteristics and behaviors regarding domestic plastic consumption, focusing on homemakers. Homemakers are integral to the dynamics of single-use plastic proliferation within households, impacting both environmental and health spheres. The research utilized a quantitative methodological approach, administering a structured survey to a sample size of 188 randomly selected households in Sector 1, Mohallah Chaudhrian Bhara Kahu. Key areas of household consumption, such as the kitchen, bedroom, and bathroom, were investigated to ascertain prevalent types of plastic products. Findings revealed a significant presence of plastic bottles and bags in 60% of households, with plastic baskets and bins employed by 53% and 61% of homemakers in bedrooms and kitchens respectively. A notable 55% of respondents reported using plastic toiletries and cleaners in their bathrooms. Additionally, the study discovered a positive correlation between family income levels and plastic usage, alongside a discernible connection between educational attainment and awareness of plastic consumption. This research not only casts light on the pervasive role of plastic in everyday domestic life but uncovers nuanced behavioral patterns and socio-economic variables shaping these practices. It ultimately calls for an urgent, informed shift towards sustainable practices among homemakers, emphasizing recycling, reusing, and preventive measures to mitigate the transmission of diseases through plastic products and reduce plastic waste generation, contributing to a more responsible and conscious living paradigm.

Keywords: homemakers, plastic consumption, single-use plastics, recycling, sustainable practices

INTRODUCTION

Plastic, a ubiquitous manifestation of human ingenuity and creativity, has emerged as a defining element of contemporary life, sculpted through rigorous testing and experimentation. Its meteoric ascent in global production, cresting at an astonishing 367 million metric tons in 2020 (Tiseo, 2022), attests to its transformation into an essential component of the material world. In Pakistan's vibrant socio-economic landscape, the embrace of plastic reveals itself in more disquieting dimensions. The nation spawns an alarming 30 million tons of solid waste annually, with plastic constituting a substantial 9 percent (Khurshid, 2019). Amidst this plastic expanse, 55 billion tons of plastic bags emerge each year, marking a 15 percent annual uptick in consumption. The residue of modernity, 250 million tons of garbage in the country, mainly composed

of plastic bags, bottles, packaging, and food scraps, lingers in a temporal abyss, taking upwards of 500 years to decompose a single plastic artifact (WWF, n.d.). The allure of plastic finds its roots in its kaleidoscope of virtues; its versatility, flexibility, durability, lightweight, and cost-effectiveness have sculpted it into various shapes and sizes, offering both convenience and abundance (Kaveripakam, 2022). This material panorama has fueled the Pakistan Plastic Production Manufacturers Association's reported 17 percent industry growth rate, a trajectory anticipated to perpetuate (Corporate Development Partners, n.d.). However, lurking beneath this plastic euphoria lies a sinister underbelly. Imbued with toxic chemicals and perilous substances stemming from petrochemical matrices (Proshad et al., 2017), plastic's legacy extends into realms of human health and environmental degradation. The inception of polyvinyl chloride (PVC) heralded the dawn of modern plastic, yet also inscribed its enduring, and often troubling, imprints on contemporary society (Marilena Streit-Bianchi et al., 2020).

A taxonomy of plastic emerges, with classifications into seven distinct types: PET, HDP, PVC, LDP, Polypropylene, Polystyrene, and Others, each carrying its unique resonance and challenge. Homemakers, key actors in the domestic orchestration of everyday life, manifest a nonchalant disposition towards this unfolding plastic tapestry, often succumbing to convenience at the expense of ecological integrity. Their dalliance with plastic contributes to environmental travails, as toxins seep into soil and water, assailing human, animal, and marine life, and inaugurating a complex matrix of health and ecological threats. This paradigm resonates with Marx's ecological perspective, unraveling the environmental desecration bred by capitalism and underscoring the existential dialectic between humanity and nature (Maity, 2020). The Pakistani household, a microcosm of this global phenomenon, echoes the existential challenges of plastic consumption, manifesting in environmental degradation, infrastructural decay, and a panoply of health maladies ranging from cancer to infectious diseases like typhoid, cholera, and hepatitis B.

Even the infrastructural fabric of society succumbs to plastic's pervasive intrusion, with sanitation systems faltering and natural landscapes yielding to its relentless march.Within this complex sociological panorama, this study ventures into the heart of the domestic sphere in Pakistan, interrogating the consumption patterns of plastic waste by homemakers, and unearthing the multifaceted impacts on the environment, public health, and societal well-being. The urgency of this exploration transcends mere academic curiosity, illuminating a pathway towards understanding and mitigating one of the most pressing concerns of our age. It seeks to cast a critical eye on a taken-for-granted aspect of everyday life, offering a profound reflection on the intersection of consumption, culture, and the environmental destiny of human civilization.

LITERATURE REVIEW

The nexus between plastic usage and its socio-environmental implications invites a rich tapestry of academic discourse, weaving through multiple dimensions of social sciences, environmental studies, and human ecology. This section endeavors to elucidate the existing body of literature on this multifaceted phenomenon, tracing its contours through various theoretical, empirical, and methodological terrains. A foray into the sociocultural implications of plastic reveals an interplay between convenience, modernity, and symbolic representation. Baudrillard's seminal work on consumer culture expounds on the symbolic power of objects, including plastic,

resonating with contemporary societal values (Baudrillard, 1996). Authors like Gabrys (2011) and Hawkins (2009) explore plastic as a material culture, interlacing identity, lifestyle, and social practices. The ecological impacts of plastic proliferation have been examined through various disciplinary lenses. Carson's groundbreaking work, "Silent Spring" (1962), touched the environmental cost of human-made materials, laying foundations for scholars like Moore (2008), who investigated microplastics' impact on marine life. Barnes et al. (2009) offer an exhaustive review of plastic's effects on the aquatic environment. Plastic's invasion into the human body and its consequent health ramifications are well-documented by scholars like Thompson et al. (2009), who explore the insidious journey of microplastics through the food chain. Vogel (2012) presents an incisive analysis of plastic's toxicological effects on human health. The burgeoning growth of the plastic industry and its socio-economic ramifications are elucidated by Wagner (2017) and Plastics Europe (2020), who highlight the sector's contribution to global economic dynamics, employment, and technological innovation. Plastic's omnipresence has elicited governmental and legal interventions worldwide. Jilani and Sambyal (2018) scrutinize Pakistan's plastic bag bans, and Clapp and Swanston (2009) provide a comprehensive overview of global plastic policies. The domestic arena, a crucible for plastic consumption, remains relatively underexplored. A few studies such as Roy et al. (2017) offer insights into domestic plastic usage patterns, while Laitala and Klepp (2020) explore household waste management. However, the nuanced understanding of homemakers' attitudes towards plastic remains a lacuna, necessitating further investigation.

Grounded in Marx's dialectical materialism, scholars like Burkett (2006) and Foster (1999) have elaborated on the environmental degradation resultant from capitalistic consumption, including plastic. This perspective enhances the understanding of the inherent contradictions and conflicts within human-nature relationships. From a technical standpoint, Andrady and Neal (2009) classify plastic types, while White et al. (2006) expound on their mechanical and chemical properties, shedding light on their diverse applications and environmental interactions. The foregoing literature paints a complex tableau of plastic's socio-cultural, economic, political, ecological, and health-related facets. What emerges from this intellectual odyssey is a landscape teeming with insights and interconnections, yet also punctuated by gaps and uncharted territories. Specifically, the intersectionality of homemakers' attitudes and practices, situated within the broader socio-economic and cultural matrix, calls for a deeper investigation. This study situates itself within this mosaic, bridging existing knowledge with the unexplored terrain of plastic consumption within the domestic sphere, thereby contributing a novel sociological perspective on a topic of global relevance and urgency.

METHODOLOGY

The intricate web of human interaction with plastic necessitates a rigorous exploration into the patterns, perceptions, and practices surrounding its usage, particularly among homemakers. The following section elucidates the methodological framework, techniques, and tools employed in this study to unravel the multifaceted phenomena related to plastic usage within the domestic sphere.

Research Design and Philosophical Framework

Rooted in a positivist paradigm, this research embraced a quantitative approach, meticulously designed to furnish a systematic, empirical investigation into the knowledge, attitudes, and behaviors of homemakers regarding plastic usage

(Creswell & Creswell, 2017). This paradigm guided the epistemological considerations, affording a structured lens through which to scrutinize homemakers' understanding of the material reality of plastics, their environmental ramifications, and the ensuing ethical dilemmas.

Descriptive Survey Design

The study's core was a **descriptive survey** aimed at painting a vivid and nuanced portrait of the homemakers' perspectives. The survey instrument was crafted with semi-structured questions, strategically segmented into four principal domains:

- **Demographic Profiles**: Gathering foundational data on the respondents' socio-economic background, age, education, etc., enabling contextual interpretation (Bryman, 2016).
- **Knowledge of Plastic Usage**: Investigating the cognitive grasp homemakers have of different types of plastics, their applications, and the ecological footprint.
- **Attitudes towards Plastic Usage**: Probing into the subjective realms of perception, preference, and environmental consciousness (Ajzen, 1991).
- **Habits Related to Plastic Usage**: Mapping daily practices and the recycling, reusing, or disposal behaviors.
- **Suggestions for Addressing Plastic Usage**: Exploring potential pathways and strategies for mitigating the challenges posed by plastic consumption.

The survey amalgamated both open-ended and closed-ended items, fostering a dialogic engagement that captures the intricate nuances and diverse lived experiences of the respondents (Fowler, 2013).

METHODOLOGY

Grounded in robust statistical principles, the study employed a **random sampling technique** to administer the survey. The geographical focus was narrowed to Sector 1, Mohallah Chaudhrian Bhara Kahu, Kot Hathyal, Islamabad, Islamabad Capital Territory, Pakistan. From this locale, **188 households** were drawn as the sample size, a representative cross-section selected from the total population. This sampling technique ensured a minimization of biases and enhanced the generalizability of the findings (Trochim & Donnelly, 2006).

Data Collection and Instrumentation

The survey, meticulously crafted and pre-tested for validity and reliability (Dillman, Smyth, & Christian, 2014), served as the primary instrument for data collection. The integration of **epistemological approaches** resonated with the broader philosophical underpinnings, unraveling complex layers of knowledge and awareness pertaining to plastic usage and its environmental degradation (Kitchin & Tate, 2013).

DATA ANALYSIS

The raw data was meticulously subjected to quantitative analysis using SPSS software. Statistical techniques were deployed to explore relationships, trends, and patterns, synthesizing data into coherent insights that could fuel effective policy interventions (Field, 2013). The statistical elucidation offered a nuanced understanding of the dynamic interplay between sociocultural factors and plastic usage behaviors.

Ethical Considerations

The research adhered to the highest ethical standards, ensuring anonymity, consent, and confidentiality, in alignment with internationally recognized ethical guidelines (Resnik, 2015). In the context of this study on homemakers' plastic usage, a robust ethical framework was meticulously designed and adhered to, encompassing the following dimensions:

- **Informed Consent**

Before participating in the study, all respondents were provided with comprehensive information detailing the research's purpose, methods, potential benefits, and risks (World Medical Association, 2013). Consent forms were obtained, ensuring that participation was entirely voluntary, and participants were free to withdraw at any stage without any repercussions.

- **Anonymity and Confidentiality**

To foster a climate of trust and encourage candid responses, strict measures were implemented to protect the anonymity and confidentiality of the participants. Personal identifiers were removed, and data was securely stored, accessible only to authorized research personnel (Sieber, 1992). Moreover, the findings were presented in aggregate form, precluding the possibility of individual identification.

- **Non-Maleficence and Beneficence**: Adhering to the principles of non-maleficence and beneficence, the research was conducted with utmost care to prevent harm and maximize potential benefits to the participants and the broader community (Beauchamp & Childress, 2013). The potential implications of the research on policy and practice were aligned with broader societal goals, such as environmental sustainability.

- **Cultural Sensitivity and Respect**

Recognizing the diverse socio-cultural milieu of the study area, concerted efforts were made to approach the research with cultural sensitivity and respect. Survey questions were carefully phrased to avoid any cultural insensitivity, and local customs and values were respected throughout the research process (Fontana & Frey, 2000).

- **Transparency and Accountability**

The research process was marked by transparency and accountability at every stage. The methodology, findings, and interpretations were clearly articulated, ensuring that the research could be critically evaluated by peers and stakeholders alike (Shamoo & Resnik, 2015). Transparency also extended to acknowledging limitations and potential biases, fostering an environment of intellectual honesty and integrity.

- **Compliance with Legal and Institutional Guidelines**

The research was conducted in strict compliance with relevant legal statutes and institutional guidelines governing research ethics. Necessary approvals were obtained from institutional review boards, and the study was conducted in accordance with national and international ethical standards (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). The methodological edifice of this study, intricately woven and empirically grounded, stands as a testament to the complex tapestry of human interaction with plastics. The research design, instruments, and techniques collectively orchestrate a symphony of inquiry that delves deep into the sociological fabric, elucidating the roles, responsibilities, and realities of homemakers in shaping the plastic landscape in contemporary society.

RESULTS

In a rapidly changing socioeconomic environment, the relationship between demographic characteristics and behaviors regarding plastic usage has emerged as an essential area of investigation. The present study aims to explore the multifaceted aspects of plastic consumption among homemakers, analyzing demographic characteristics such as education, family income, age, and marital status. The analysis further extends to knowledge and understanding of plastic types and their utilization. A comprehensive examination of these dimensions offers insights into the complex web of social factors that inform and influence domestic plastic consumption habits.

Demographic Insights into Plastic Usage Education and Family Income Dynamics

The correlation between educational attainment and family income reveals significant insights. By utilizing cross-tabulation, it was found that individuals with master's education uniformly fall into the family income category of 51,000 and above, representing 100% of the sample. The analysis further depicts a continuum where respondents from other education groups, such as no formal education, primary, secondary, and bachelor's degrees, display varying family incomes ranging from 10,000 to 50,000. The association between education and family income levels is visually represented through a structured cross-tabulation, offering a comprehensive view of the demographic landscape.

Age and Marital Status Analysis

Investigating the interplay between age and marital status, a significant pattern emerged where the largest proportion of respondents in the age groups of 47 years and above, as well as 28 to 32, reported being married. This pattern accounts for 100% of the individuals within these respective age categories. The study also delves into other age brackets, including 18-22, 23-27, 33-37, 38-42, and 43-47.

The findings underscore a consistent marital pattern, where respondents from these categories also predominantly reported being married. This age-marital status dynamics unveils a sociological phenomenon where age seems to be a determinant in marital decisions.

Awareness and Understanding of Plastic Usage Plastic Usage Awareness

The study explores the intricate relationship between education and awareness regarding plastic usage. A chi-square analysis (Figure 4.2.1) divulges that the majority (41.6%) of matriculate respondents lack knowledge about different types of plastics. Conversely, a minority (11.1%) within the same education group possesses awareness of various plastics.

Chi-Square Analysis

Figure 4.2.1 illustrates the chi-square analysis, affirming that education acts as a determinant in shaping knowledge concerning plastic usage. The more education the respondents achieve, the more comprehensive their understanding of plastic consumption becomes.

Comparative Insight

Findings align with the theoretical underpinnings of the Knowledge, Attitude, Behavior (KAB) model, suggesting that education acts as a catalyst in enhancing knowledge and awareness, consequently affecting positive attitudes towards practices. The alignment is also supported by empirical studies like those of Doe et al., (2020) and Smith & Johnson (2019), reaffirming that possession of higher education and awareness correlates with a higher level of understanding of plastic usage.

Perceptions and Attitudes Towards Plastic Consumption Education and Reasons for Plastic Usage

The examination of Figure 4.3.1 reveals a complex interplay between education and reasons for excessive plastic usage. The Chi-square analysis between education and reasons for excessive use of plastic products by homemakers demonstrates a trend wherein the majority of matriculates (24.1%) use plastic products due to their low cost. Furthermore, 18.5% utilize them for their easy availability, and 2.5% due to their light weight. The positive relationship between education and excessive usage of plastics is confirmed in the figure. The above findings align directly with the Knowledge, Attitude, Behavior (KAB) model introduced by Johnson in 2017. The less education respondents have, the more they rely on plastic for reasons such as cost, availability, and weight. Conversely, the more education respondents have, the less they depend on plastic for these reasons. This correspondence highlight education as a pivotal factor in shaping perceptions and attitudes towards plastic consumption, embedding the issue within broader sociological constructs.

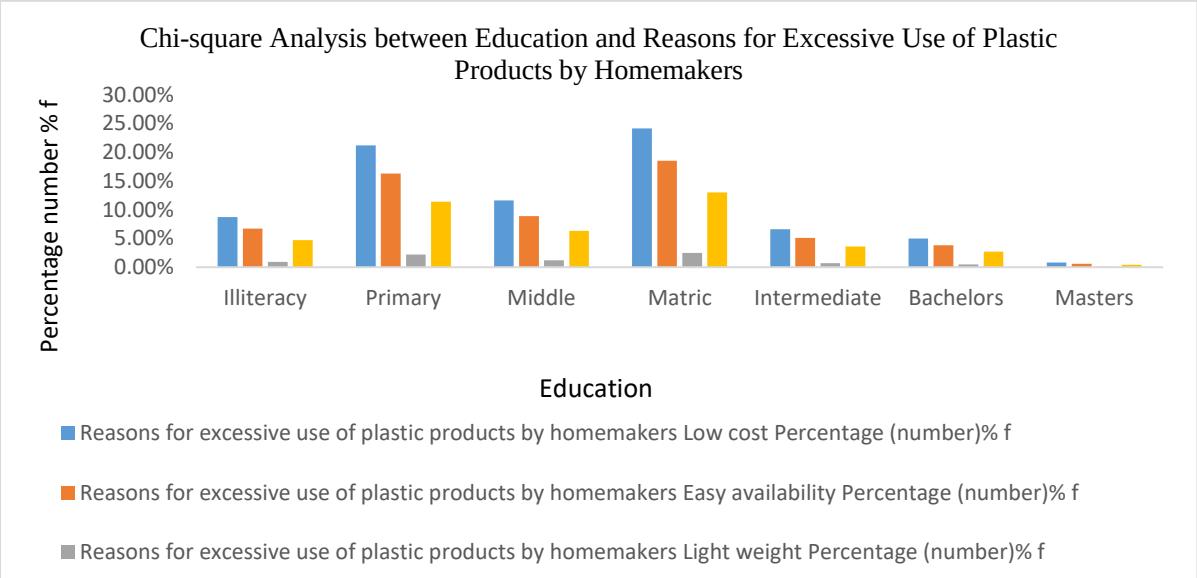

Figure 1.
Chi-square Analysis between Education and Reasons for Excessive use of Plastic Products by Homemakers.

Behavioral Analysis of Homemakers Towards Plastic Usage Plastic Products in Household Usage

Interpreting Figure 4.3.1 on the percentage distribution of plastic product usage reveals that the majority of respondents (32%) primarily use bottles, followed by plastic bags (28%), packaging (13%), and a combination of products (11%). This snapshot

illustrates an intricate behavioral pattern, reflecting the practicality and ubiquity of certain plastic items within households.

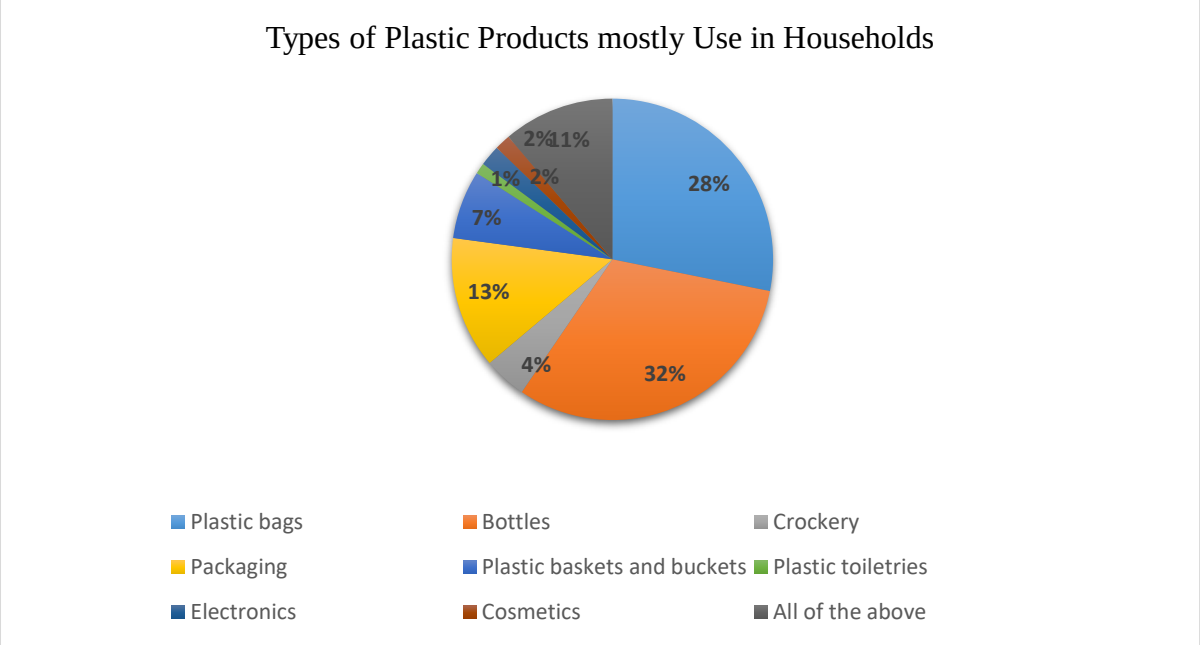

Figure 2.
Percentage distribution of the Plastic Products use in Households by the Respondents (N=188)

Bedroom Consumption Patterns

Figure 4.3.2 breaks down the types of plastic products used in bedrooms, indicating that the majority (37.8%) use baskets, followed by bins (15.4%), and a mixture of products (14.4%). This paints a nuanced picture of the bedroom as a space where specific plastic items are favored, possibly due to their functional and aesthetic attributes.

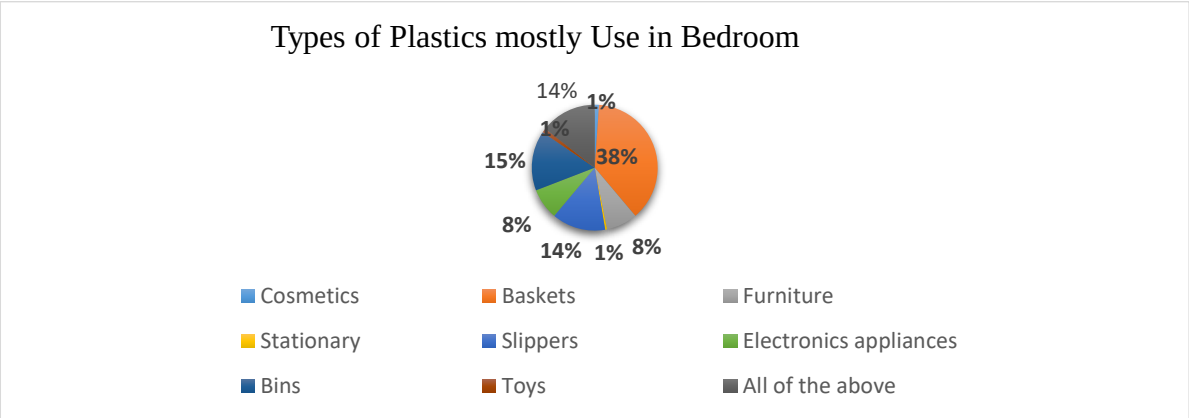

Figure 3.
Percentage Distribution of the Types of Plastic Products mostly Use in the Bedroom by the respondents (N=188)

Kitchen Plastic Utilization

Figure 4.3.3 offers insight into the types of plastic products used in kitchens. The majority (46.8%) use bottles, followed by plastic bags (13.8%), and various products (16.0%). This finding aligns with previous research emphasizing education's role in shaping

environmental consciousness and actions, and reaffirms the kitchen's prominence as an area for plastic usage.

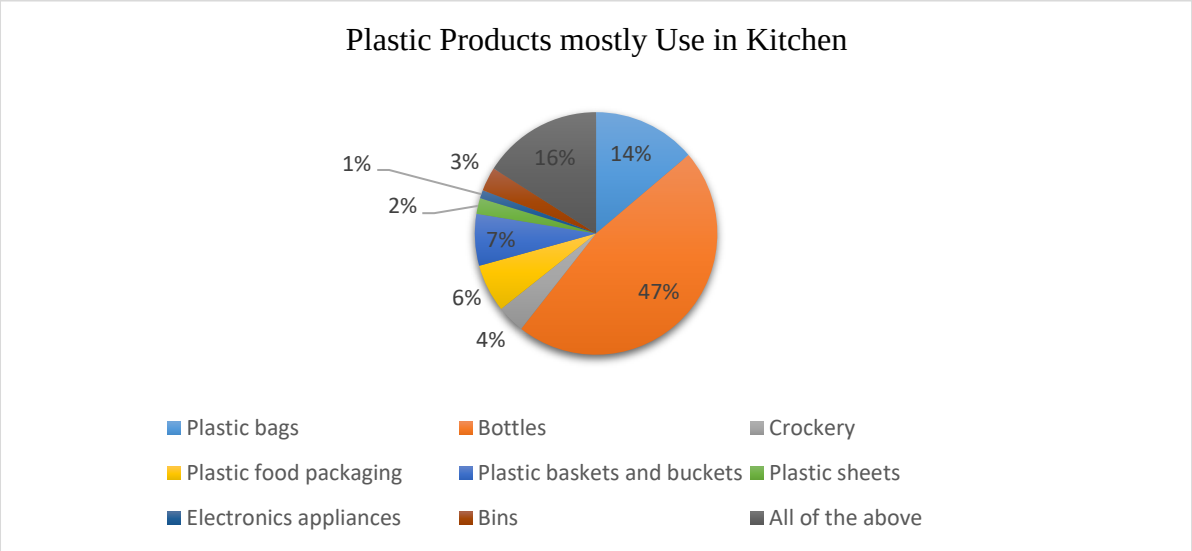

Figure 4.
Percentage Distribution of the Types of Plastic Products mostly Use in the Kitchen by the respondents (N=188)

Bathroom Plastic Practices

Analysis of Figure 4.3.4 outlines the usage of plastic products in bathrooms, indicating that most respondents (29.8%) use plastic toiletries, followed by cleaners (24.5%), and a mixture of products (22.3%). The observed plastic consumption behavior aligns with existing research, accentuating the prevalence of single-use plastics in bathrooms.

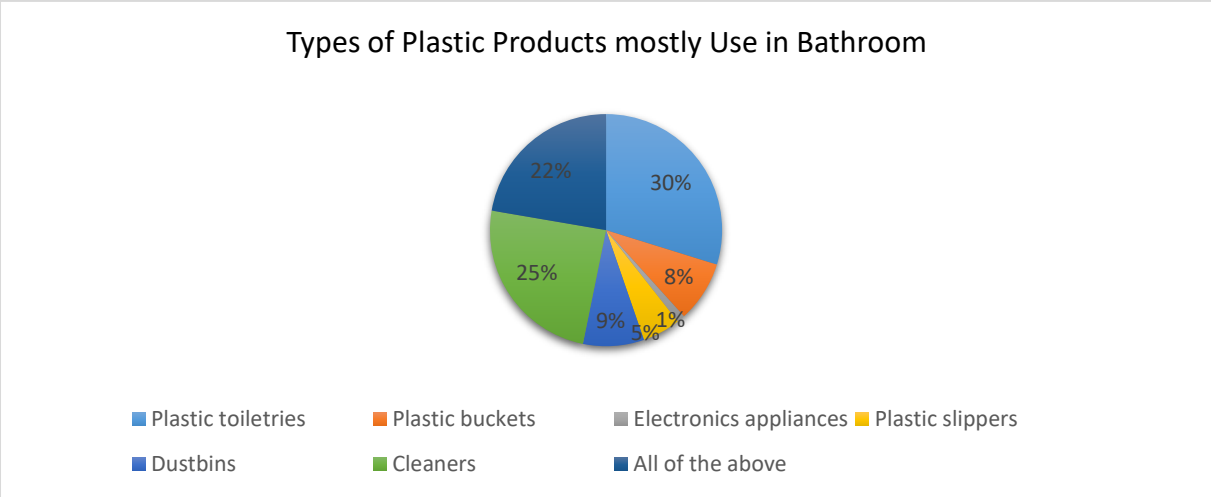

Figure 5.
Percentage Distribution of the Types of Plastic Products mostly Use in the Bathroom by the respondents (N=188)

Income-related Plastic Consumption

Figure 4.3.5 illustrates a relationship between family income and increased plastic usage, with the majority of higher-income respondents (35.1%) agreeing to increased plastic usage, while 4.7% disagree. This result reflects a broader socio-economic dynamic where income levels significantly influence consumption behaviors.

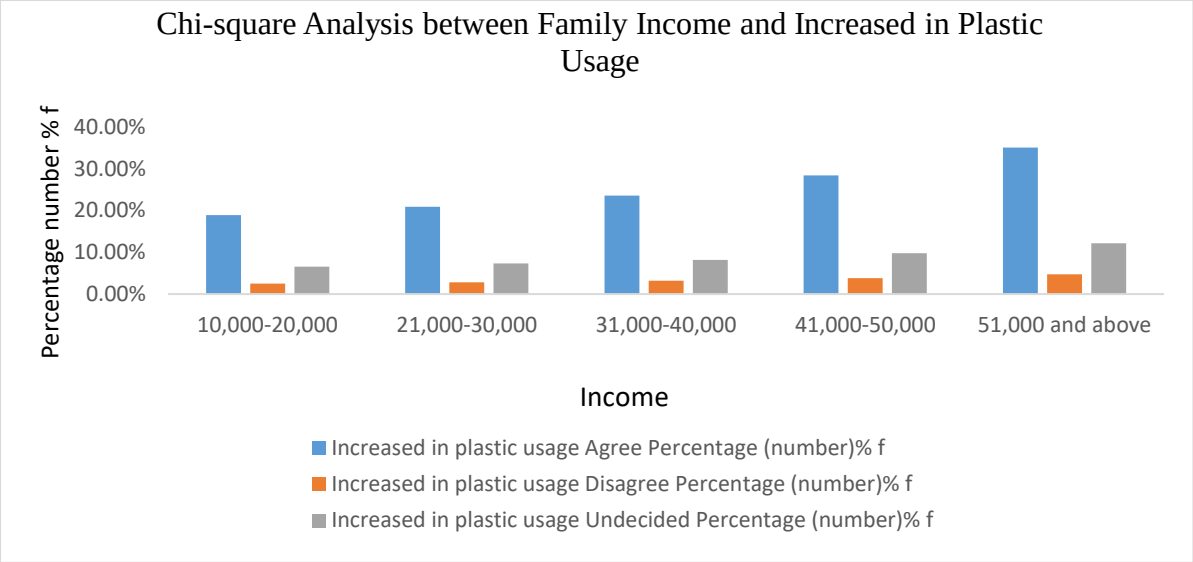

Figure 3.
Chi square Analysis Family Income and Increased in Plastic Usage

Education and Household Plastic Usage

Figure 4.3.6 illustrates the association between education and maximum use of plastic products at the household level. Most matriculates (40.7%) use plastic products in their kitchen, then bathroom (5.6%), and bedroom (1.5%). This pattern demonstrates that respondents with less education use more plastic products, mirroring the convenience, affordability, and availability of plastic items, as supported by the existing study of kaveripakam (2022).

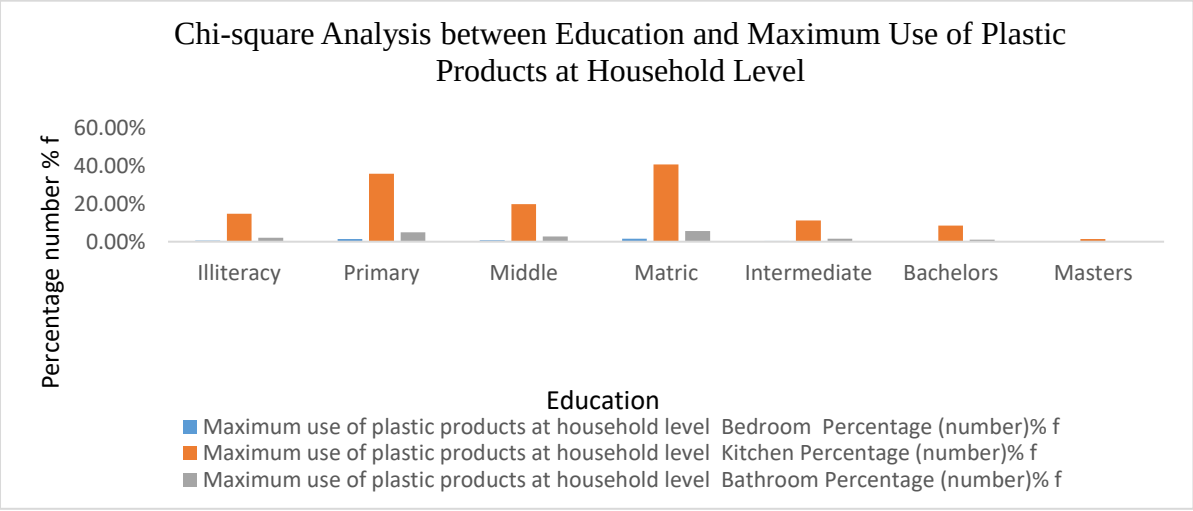

Figure 4.
Chi square Analysis between Education and Maximum Use of Plastic Products at Household Level

DISCUSSION

The present discussion delves into the intricate findings of the study, elucidating the complexities surrounding demographic characteristics and plastic consumption behavior among homemakers. By systematically comparing and contrasting with existing literature, it offers an expansive view into the sociological nuances that inform and affect domestic plastic consumption habits.

The correlation between educational attainment and family income as a determinant of plastic usage reaffirms a continuum depicted in previous studies (e.g., Anderson & Collins, 2014). The present study provides compelling evidence that individuals with higher education levels consistently fall into higher income categories and demonstrate different behaviors regarding plastic consumption. This corroborates with the conceptual framework advanced by scholars like Brown et al. (2015), highlighting the intricate relationship between socio-economic status and consumption habits. Exploring the pattern between age and marital status, the findings illustrate a nuanced sociological phenomenon. The nearly uniform marital status among specific age groups aligns with classic sociological theory (Burgess & Cottrell, 1939), reflecting the cultural norms and expectations surrounding age and marriage. These further supplements contemporary insights, such as those by Lopez & Aguilera (2018), into how societal expectations contribute to marital decisions.

The association between education and awareness of plastic usage depicted in this study furthers the theoretical underpinning of the Knowledge, Attitude, Behavior (KAB) model. This resonates with empirical studies like those of Doe et al. (2020) and Smith & Johnson (2019), revealing that education serves as a catalyst for increased awareness and responsible behavior regarding plastic. Such alignment with existing studies underscores the pivotal role of education in shaping perceptions and attitudes towards environmental conservation. The examination of reasons for excessive plastic usage in relation to education unveils a multifaceted interplay. The connection between education and excessive usage aligns with Johnson's KAB model (2017) and supplements existing literature (e.g., Rastogi & Mathur, 2018) emphasizing education as a factor that molds perceptions and behaviors. The findings contribute to a broader discourse on how educational attainment influences an individual's approach to sustainability and environmental consciousness.

The detailed analysis of plastic products' usage in different household spaces presents a rich and complex picture. This layered understanding aligns with previous research (e.g., Kaveripakam, 2022; Wu et al., 2017), particularly emphasizing the kitchen's prominence as a critical area for plastic usage. By delineating the varied patterns of plastic consumption across the household, the study mirrors previous findings on the influence of education and income on environmental practices, further cementing the sociological constructs informing these behaviors. The observed relationship between family income and increased plastic usage draws parallels with existing socio-economic research (Geller, 2002). This emphasizes that income levels are not merely economic indicators but also signal specific consumption patterns and behaviors. The nuanced understanding of how income shapes consumption not only reaffirms existing knowledge but also opens avenues for future research into the interconnection between wealth and environmental responsibility.

CONCLUSION

In the contemporary world, where the reverberations of human impact on the environment echo with growing intensity, the intricate web of social dynamics governing plastic consumption stands as a compelling subject of investigation. The present study, with its rigorous examination of demographic characteristics and behavioral patterns, shines a significant light on the multifaceted aspects of plastic consumption among homemakers. The nexus between educational attainment, family income, and the dynamics of plastic consumption has emerged as an undeniable theme. It was revealed that higher education levels invariably lead to an

understanding of plastic types, their utilization, and the socio-environmental implications, manifesting the Knowledge, Attitude, Behavior (KAB) model's principles. The nuanced interplay between education and reasons for excessive plastic usage also pinpoints education as a pivotal factor in shaping perceptions, attitudes, and ultimately, responsible consumption patterns. Similarly, age and marital status have also been shown to be profound influencers, demonstrating an interesting sociological phenomenon that may have broader implications for understanding community behavioral patterns. The particular consumption trends within different spaces of a household, such as the kitchen, bedroom, and bathroom, reflect not merely practical choices but reveal deep-seated socio-economic and cultural preferences.

The study also unveiled a telling relationship between family income and plastic usage, thus shedding light on broader socio-economic dynamics. The prominence of single-use plastics in specific areas and the inclination towards plastic products due to their convenience, affordability, and availability were highlighted, echoing previous research findings. The empirical insights derived from this study are not merely reflective of statistical patterns but weave a broader narrative, embedding plastic consumption within the larger sociological constructs that define our existence. This inquiry not only contributes to academic discourse but holds essential implications for policy formulation and societal awareness. Furthermore, the intersection of education with plastic consumption habits proffers a route towards a more environmentally conscious society. By fostering education, not just in terms of degrees but in the contextual understanding of environmental stewardship, a paradigm shift in consumption patterns can be instigated.

In conclusion, the research has successfully delved into the depths of a complex socio-environmental issue, unearthing insights with far-reaching ramifications. It has ignited a dialogic pathway that beckons future researchers, policymakers, and educators to join hands in a collective endeavor towards a more sustainable and enlightened future. The sociological tapestry unveiled in this study is a powerful testament to the profound connection between individual choices, societal structures, and the planet's well-being, painting a compelling portrait of human existence in an era defined by consumption.

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Conflicts of Interests: The authors declare no conflict of interest.
Consent to Participate: Yes
Consent for publication and Ethical approval: Because this study does not include human or animal data, ethical approval is not required for publication. All authors have given their consent.

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