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Awareness of the Harmful Effects of Plastics on Health and Environment: A Demographic Analysis

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This study investigated the level of awareness concerning the ill effects of plastics on the environment primarily and drastically on human health and among various demographic groups in Coimbatore, India. A sample of 1,200 participants, consisting of 633 males and 567 females aged 18 to 61 years and above, were selected through purposive sampling. The Cancer-Causing Plastics Awareness Scale (CCPAS) was used to measure participants awareness of issues related to plastics, including their carcinogenic potential, disposal methods, sources and environmental impacts. The data was analyzed using ANOVA revealed that awareness did not significantly differ across most demographic factors. Specifically, there were no differences found in level of awareness regarding plastics and cancer, plastics disposal, or environmental effects across different age groups, genders, educational levels and occupational statuses. A significant difference was observed in the knowledge of the source of plastics among different age groups and educational levels, with participants with higher education levels demonstrating greater awareness, respondents from metropolitan areas exhibited more awareness of the cancer risks associated with plastics than those from tribal or village areas. These findings indicate that awareness of the harmful effects of plastics is generally widespread, likely due to the extensive reach of media coverage and environmental education initiatives. The results signify the importance of reinforcing the message of environmental sustainability across all demographics to ensure an overall understanding of the risks associated with plastic use.

Keywords: Plastics, Environmental awareness, Carcinogenic Potential, Demographic Factors, Cancer Causing Plastics Awareness Scale, Sustainability

Plastics are almost inevitable in everyday life. Though people are presented with tradeoffs and alternatives to plastic but usage of alternatives depend on time, energy, cost, resource invested, convenience etc. Since the usage of plastics is associated with the consumption patterns of middle- and upper-income groups and the disposal culture of non-biodegradable plastic has been irresponsible in spite of the spread of awareness campaigns and enactment of various laws, lot needs to be done on the personal level on the reduced usage and anti-littering agenda. This agenda cannot go on without yielding results until an understanding on the impeding psychological factors including level of awareness, attitudes and efficacy of the user in plastic waste problem. Research findings indicate that several key factors contribute to an individual's willingness to maintain long-term commitment. These factors include an

awareness of the challenges, needs, and risks faced by a particular group of individuals who are not responsible for the circumstances they endure. Additionally, recognizing that these situations represent a breach of justice norms plays a crucial role in shaping attitudes. A strong sense of moral responsibility, wherein individuals feel accountable for addressing and mitigating these issues, further influences their commitment. Lastly, a person's confidence in their ability to make a meaningful difference—referred to as self-efficacy—has been found to be closely linked to their dedication to sustained efforts in resolving these challenges (Leo, Kals, & Becker, 2007).

Having stated as how usage and disposal of plastic is unsustainable, it becomes pertinent to examine

- how far the awareness of plastic in touch with food products or when burnt or incinerated becomes a carcinogenic to human health
- the extent that the general public thinks they exercise control over usage of plastics in day-to-day life
- the psychological dynamics in the direction of causality for an environmentally unsustainable problem like usage and disposal of plastics

The above-mentioned focal issue of the research work revolves around several key empirical concepts that have been surrounding the human environment interaction that leads to unsustainability. Researches in Environmental Psychology on human environment interaction, in general, have been classified into three broad categories (a) studies on environmental values (b) studies on environmental attitudes (c) environmental concern and proenvironmenta /ecological behaviour.

Plastic Usage and Human Health

The pervasive presence of plastics has become a severe threat to both environmental and human health. Due to their hazardous chemical composition and the potential release of toxic substances, plastics contribute significantly to pollution and long-term ecological damage. They account for approximately 16% of the chlorine found in the environment and contain as many as 54 known carcinogenic compounds. One of the most alarming concerns arises when polyethylene bags, widely used and discarded irresponsibly, are incinerated without adequate safety measures. This process releases highly toxic gases, including phosgene, carbon monoxide, chlorine, sulfur dioxide, and nitrogen oxides. Additionally, combustion leads to the emission of dioxins—extremely harmful compounds with serious environmental and health implications. These pollutants contribute to air contamination, increase the risk of respiratory illnesses, and disturb the natural ecological balance (Sikka, 2004).

Plastics are known to contain a range of harmful substances, but one compound that has attracted significant concern is Bisphenol-A (BPA). This man-made chemical is heavily utilized in the manufacture of certain plastics, particularly polycarbonate and epoxy resins. You can find BPA in numerous everyday items—like food containers, canned food linings, baby bottles, dental sealants, plastic utensils, CDs, DVDs, and even eyewear.

What makes BPA especially worrisome is its tendency to seep from plastic products when they're subjected to heat. This leaching allows the chemical to contaminate food and drinks, which people then consume, unknowingly introducing BPA into their systems. Studies from both the U.S.

Department of Health and Human Services (2008) and Health Canada (2008) found BPA in the urine of more than 90% of people tested, spanning children to adults. Women and children, particularly those from lower-income households, tended to have higher levels in their systems (Calafat, Ye, & Wong, 2008).

According to findings from the U.S. National Toxicology Program, BPA exposure has been linked to neurological changes, behavioral disturbances, and developmental impacts on organs such as the prostate and mammary glands. In girls, early puberty has also been associated with BPA exposure, potentially raising their risk of developing breast cancer later in life. Alarmingly, babies and young children appear to be the most exposed, especially when fed with heated polycarbonate baby bottles. BPA has even been identified in breast milk.

BPA is classified as an endocrine-disrupting compound, meaning it can imitate estrogen and disrupt hormonal activity, even in very small amounts. This interference has been associated with a wide array of health conditions, including Type 2 diabetes, heart disease, reproductive abnormalities, diminished effectiveness of cancer treatments, and heightened risk of hormone-related cancers like those of the breast and prostate (Sekizawa, 2008).

Another plastic-related hazard is polyvinyl chloride (PVC), which often includes phthalate esters—chemical additives used to make the plastic more flexible. These additives can slowly leach into the surrounding environment, and prolonged exposure has been linked to liver damage (Agneta, Ganning, Brunk, & Dallner, 2008).

Further studies on environmental hormone disruptors show that chemicals like BPA can interfere with sexual development and reproductive health, especially when exposure happens during key growth phases (Markey, Coombs, Sonnenschein, & Soto, 2002). There's also growing concern about BPA's impact on brain development, with links being drawn between exposure and behavioral disorders that mimic those seen in mental health conditions like schizophrenia (Brown, 2009).

The effects of BPA aren't limited to those directly exposed, either. Evidence suggests that its influence can carry across generations, affecting the offspring of those exposed (Uzumcu & Zachow, 2007). Research also shows BPA may interfere with adipokine release—important hormones that help regulate metabolism and guard against conditions like obesity and metabolic syndrome (Hugo et al., 2008).

In summary, the prevalence of plastics containing BPA and similar chemicals raises serious alarms for both human health and the environment. These substances don't just pollute; they disrupt biological systems, influence developmental stages, and elevate disease risk. Ongoing research underscores the need for safer alternatives and stricter policies to reduce exposure and protect future generations.

Nguyen et al. (2025) integrate the Theory of Planned Behaviour (TPB) and the Norm Activation Model (NAM) to examine how knowledge of single use plastic waste's environmental impact influences FPT university students' behaviour in reducing SUPP use. Using a quantitative approach with 506 students, analyzed via SPSS, AMOS, and SmartPLS, the study finds that increased awareness positively impacts SUPP reduction behaviour. Additionally, socialization of responsibility shapes proenvironmental behaviour through personal norms, subjective norms and behavioural intention.

The findings provide a basis for future research and practical communication strategies to promote sustainable behaviour.

Tabassum et al. (2025) highlighted the environmental and health risks of plastic production, consumption and waste. They emphasize resource depletion, toxic emissions and the dangers of single use plastics. Improper disposal leads to persistent pollution, ecosystem disruption and health issues like endocrine disorders and cancer. The study calls for stricter regulations, public awareness and global collaboration to reduce plastic pollution.

Vincoff et al. (2024) studied the Known and Unknown Carcinogenic Potential of Plastic Additives and found that over 150 additives are known carcinogens, while nearly 90% lack carcinogenicity data. Many additives, both with and without known carcinogenicity, affect similar biological pathways, including DNA damage, apoptosis, immune response, viral diseases and cancer. The results highlighted the need for systematic carcinogenicity assessments and regulatory actions to address potential health risks associated with plastic exposure.

Damaj et al. (2024) scrutinized the various exposure routes of microplastics (MPs) and nano plastics (NPs) and their potential health risks, particularly in foetal development. MPs and NPs can enter the body through inhalation, ingestion, skin contact and placental transfer, with evidence suggesting their ability to cross the placental barrier and disrupt cellular pathways. Animal and in vitro studies indicated potential developmental toxicity, but knowledge gaps remain regarding the most harmful plastic types and their precise health impacts. The study emphasized the need for large scale epidemiological research and improved methods to assess MP and NP exposure and toxicity.

Kannan and Vimalkumar (2021) evaluated human exposure to microplastics (MPs) through air, water and diet, with bottled water and indoor air being major sources. They highlighted that MPs can cross biological membranes and impact newborns and infants, with evidence of MPs found in human placenta and stool. MPs are linked to inflammation, endocrine disruption and altered lipid metabolism, potentially contributing to obesity. The results suggest MPs act as obesogens by disrupting energy production and adipogenesis. Despite widespread exposure, more research is needed to understand MPs' health risks.

Campanale et al. (2020) explored the concept of "Plasticene," an era marked by the widespread presence of plastics, particularly microplastics. They emphasize the dual threat posed by MPs, they not only carry toxic chemicals into ecosystems but also contain hazardous additives that enhance plastic durability. As microplastics degrade, they release these chemicals into the environment, highlighting a critical gap in understanding the long term health risks associated with these additives. The study calls for further research and policy interventions to mitigate these dangers.

Lehner et al. (2019) examined the growing presence of nanoplastics in the environment and their potential health implications, emphasizing their distinct characteristics compared to larger plastic particles. These extremely small plastic fragments can accumulate within ecosystems, yet their long-term environmental and biological effects remain largely unexplored. The study explores how nanoplastics enter the human body and interact at the cellular level, with their size and surface chemistry playing a

crucial role in determining their risks. Laboratory research indicates that nanoplastics can trigger cellular responses, raising concerns about their possible adverse health effects. The authors stress the urgent need for further research to better understand these impacts and enhance detection technologies.

In addition to air and water contaminants, the improper disposal and incineration of plastics present another significant environmental carcinogen. The combustion of plastics releases numerous carcinogens and toxic substances, including dioxins, which contribute to serious health risks and environmental pollution (Sikka, 2004; Forbid, Ghogomu, Busch, & Frey, 2011). The practice of open burning at waste dumps, prevalent in India, exacerbates these risks, releasing harmful pollutants that contribute to acid rain and climate change. Moreover, higher chromium levels have been detected among oral cancer patients blood stream in Central Taiwan, indicating a possible link between environmental contamination and cancer incidence (Chiang et al., 2011). These findings underscore the need for stringent sustainable waste management practices and environmental regulations to reduce the carcinogenic burden on populations. Moreover, the studies have highlighted the significant prevalence of plastic particles in the human body, whereas despite this knowledge human being still continue to use plastic materials to store food, water etc. Therefore, it becomes imperative to study the awareness of the ill effects of plastics specifically the four subscales measuring factors with regard to the awareness on (a) "Plastics and Cancer", (b) "Plastics Disposal" (c) "Knowledge of the Source of Plastics" and (d) "Plastics Usage and Environmental Effects" among the different age groups (H1), gender (H2), educational level (H3), geographical locale (H4), and different occupational status were arrived.

Method

Participants

The objective of the study was to understand the extent of Awareness about the various aspects surrounding plastics and its ill effects towards human health and environment. Thousand two hundred general public participated in this study, involving 633 male and 567 women in the age group of 18 – 61 and above years were selected by purposive sampling in and around Coimbatore, India in terms of Age, Gender, Education, Geographical Locales and Occupational Status. The data was collected using Cancer Causing Plastics Awareness Scale (CCPAS) developed and standardised for the purpose of the study.

Measure

The indigenous scale developed by Velayudhan and Srividya (2010a) for the present study for measuring awareness, measures the extent to which the respondents are aware of the various facts pertaining to the source of plastics, how to handle plastic waste, plastics in food contact and how it enters food cycle, the carcinogenic aspect of plastics in food contact and incineration of plastics and its environmental effects. The internal consistency was measured using Cronbach Alpha was found to be 0.78. The Kaiser-Meyer-Olkin (KMO) test yielded a sampling adequacy value of 0.78, while Bartlett's Test of Sphericity demonstrated statistical significance. These results confirm that the variables exhibit a sufficient level of correlation, making them suitable for factor analysis (Table 1).

Table 1: Factor Loadings of the Cancer Causing Plastics Awareness Scale (CCPAS)

FACTORS	LOADINGS			
	Factor 1	Factor 2	Factor 3	Factor 4
1. Plastics and Cancer				
Most of the BPA that is produced is used widely in consumer products that come into contact with food and beverages	0.79	-0.15	0.10	0.03
Daily human consumption of Bisphenol-A comes from food and beverage sources which are packaged in plastic products	0.78	-0.12	0.14	-0.00
Plastics are used in food wrappings can infuse the Bisphenol –A	0.73	-0.03	-0.19	0.00
Bisphenol-A is a contaminant that can cause cancer, especially breast cancer	0.72	0.01	-0.15	0.00
Bisphenol-A (BPA) is a chemical found in the plastics that are used for making drinking water bottles	0.70	0.01	0.13	-0.08
Plastic reusable bottles may also cause cancer risk when the bottle is washed, heated and/or reused	0.66	0.03	0.27	0.11
Vinyl chloride and dioxin, both carcinogens, are released through the production of Poly Vinyl Chloride (PVC) plastic	0.58	0.32	0.23	-0.07
Plastic account for 16% of chlorine in the environment and have 54carcinogens	0.61	-0.02	0.07	-0.39
2. Plastic Disposal				
Burning and throwing away of plastics waste are major causes of air and water pollution	-0.01	0.78	0.14	0.10
Many plastic products make use of numerous chemicals added to make them as plastic products	0.12	0.70	-0.19	0.07
Plastic products take more than hundreds of years to bio degrade	-0.15	0.69	0.36	0.04
Some plastics leach toxic chemicals when heated, put under pressure or as they age	-0.04	0.66	0.29	0.09
There are three ways to plastic waste problem - reduce, recollect and reuse	-0.08	0.50	0.17	0.47
3. Environmental Effects				
Burning of plastic products would emit cancer causing gases in the environment thereby making it more pollutant	0.12	0.15	0.78	0.16
Polythene bags for disposal when burnt irresponsibly, tend to release highly toxic gases	0.25	0.19	0.74	-0.11
4. Source of Plastics				
The raw material of plastic is crude oil	0.05	0.10	-0.03	0.79
Not all plastics are recycled and are left to land refills	-0.12	0.28	0.46	0.53
Eigen Value	4.26	3.53	1.18	1.05
% of total variance	25.10	20.79	6.98	6.19
Total Variance				59.07

A set of seventeen statements concerning awareness of plastics, their environmental and health effects, and their possible carcinogenic properties was evaluated through principal component analysis (PCA) with varimax rotation. This statistical approach revealed four clear factors, which together explained 59.07% of the overall variance and satisfied the required measurement standards. The first factor, labeled "Plastics and Cancer," had high loadings on statements such as plastics contributing 16% of chlorine in the environment. This factor accounted for 25.10% of the total variance. The second factor, termed "Plastic Disposal," was characterized by strong associations with statements emphasizing the role of plastic burning and improper disposal as primary sources of pollution. This factor explained 20.79% of the variance. The third factor, named "Environmental Effects," accounted for 6.98% of the variance, with high loadings on statements related to the environmental consequences of plastic incineration. The fourth factor was named as "Sources of Plastics" and the variance explained was around 6.19% due to high loadings by items such as the raw material of plastics is crude oil. The data obtained through this scale was analyzed and discussed.

Results

The table 2 presents the Means, S. Ds and F values of the four subscales measuring factors with regard to the awareness on (a) Plastics and Cancer,

(b) Plastics Disposal (c) Knowledge of the Source of Plastics and (d) Plastics Usage and Environmental Effects, among different age groups. The extent of differences among the respondents on CCPAS was analyzed using ANOVA in terms of Age, Gender, Education, Geographical Locales and Occupational Status.

Table 2: Mean, S.D. and ANOVA among the Age Groups in Awareness of the Ill Effects of Plastics

Awareness	Age Groups	N	Mean	S.D.		Sum of Squares	df	Mean Square	F	Sig.
Plastics and Cancer	18-20	184	9.50	2.28	Between Groups	23.22	3	7.74	1.34	N.S.
	21-40	581	9.41	2.37						
	41-60	265	9.76	2.54	Within Groups	6902.5	1196	5.77		
	61 and above	170	9.45	2.38						
	Total	1200	9.51	2.40						
Plastics Disposal	18-20	184	7.32	0.95	Between Groups	3.38	3	1.12	0.90	N.S.
	21-40	581	7.20	1.12						
	41-60	265	7.24	1.17	Within Groups	1497.3	1196	1.25		
	61 and above	170	7.14	1.16						
	Total	1200	7.22	1.11						
Knowledge of the source of plastics	18-20	184	5.10	.89	Between Groups	8.87	3	2.95	3.03	0.02**
	21-40	581	4.95	1.00						

	41-60	265	4.97	1.01						
	61 and above	170	4.78	0.97	Within Groups	1165.2	1196	0.97		
	Total	1200	4.96	0.98						
Plastics Usage and Environmental Effects	18-20	184	3.26	0.72	Between Groups	0.73	3	0.24	0.46	N.S.
	21-40	581	3.20	0.71						
	41-60	265	3.24	0.73						
	61 and above	170	3.26	0.73	Within Groups	630.3	1196	0.52		
	Total	1200	3.23	0.72						

** = Significant at 0.01 level N.S. = Not Significant

The ANOVA result shows no significant differences among the respondents in terms of their age classification in the dimensions such as "Plastics and Cancer", "Plastics Disposal", "Plastic Usage and Environmental Effects". The reasons could be that the awareness on plastics that can cause cancer is explicitly known, but usage of plastic is hazardous to human health, and plastic usage causes environmental deterioration has been given wide publicity by all forms of popular media (print, radio and television), Environmental Educational Programmes and Non-Governmental Organizations. However, significant differences were found among the respondents in terms of their age classification in the Knowledge of the Source of Plastics. Hence, post-hoc analysis was done on the "Knowledge of the Source of Plastics" among the age groups.

Thus, the hypothesis H1 "There will be a significant difference among the respondents of different age groups with reference to Awareness on the Ill Effects of Plastics" is partially accepted.

Table 3: Mean, S.D. and ANOVA among the Gender in Awareness of the Ill Effects of Plastics

Awareness	Gender	N	Mean	S.D.		Sum of Squares	df	Mean Square	F	Sig.
Plastics and Cancer	Males	633	9.49	2.42	Between Groups	0.60	1	0.60	0.10	N.S.
	Females	567	9.53	2.37	Within Groups	6925.15	1198	5.78		
Plastics disposal	Males	633	7.20	1.11	Between Groups	0.66	1	0.64	0.51	N.S.
	Females	567	7.24	1.11	Within Groups	1500.05	1198	1.25		
Knowledge of the	Males	633	4.93	1.00	Between Groups	0.72	1	0.72	0.73	N.S.
source of plastics	Females	567	4.98	0.97	Within Groups	1173.35	1198	0.97		
Plastics Usage and	Males	633	3.22	0.73	Between Groups	0.12	1	0.12	0.23	N.S.
Environmental Effects	Females	567	3.24	0.71	Within Groups	630.93	1198	0.52		

N.S. = Not Significant

The ANOVA results indicate no significant gender differences in awareness across all factors of the Cancer-Causing Plastics Awareness Scale (CCPAS). Since plastic pollution affects everyone, information about its environmental and health impacts is widely disseminated through education and media channels. Consequently, both men and women exhibit similar levels of knowledge regarding plastics and their harmful effects on humans and the environment. These findings contrast with the conclusions of Kuklinski, Metlay, and Kay (1982), who suggested that men tend to have greater awareness of environmental risks and that individuals with such knowledge are generally less concerned about these dangers. Additionally, the results contradict studies by Arcury, Johnson, and Scollay (1986), as well as Nelkin (1981) and Stern, Dietz, and Guagnano (1998), which argue that women are more concerned about environmental hazards—not due to a lack of knowledge but rather because of a heightened sense of care and responsibility. The present finding reflects the uprising of the environmentalism that was not so vehement during the past decade. Hence, the hypothesis H2 "There will be a significant difference among the gender with reference to Awareness on the Ill Effects of Plastics" is rejected.

Table 4: Mean, S.D. and ANOVA on Educational Level in Awareness of the Ill Effects of Plastics

Awareness	Educational Level	N	Mean	S.D.		Sum of Squares	df	Mean Square	F	Sig.
Plastics and Cancer	Below 10th Std	103	9.07	2.20	Between Groups	58.74	11.75	2.04	N.S.	
	10th Standard	158	9.72	2.44						
	Up to 12th Std	158	9.38	2.49						
	Graduate	388	9.38	2.34	Within Groups	6867.01	5.75			
	Postgraduate	271	9.80	2.45						
	Professional	122	9.55	2.40						
	Total	1200	9.51	2.40						
Plastics Disposal	Below 10th Std	103	7.01	1.25	Between Groups	12.95	2.59	2.08	N.S.	
	10th Standard	158	7.10	1.22						
	Up to 12th Std	158	7.28	1.06						
	Graduate	388	7.28	1.05	Within Groups	1487.74	1.24			
	Postgraduate	271	7.31	1.02						
	Professional	122	7.09	1.27						
	Total	1200	7.22	1.11						
Knowledge of the	Below 10th Std	103	4.72	0.96	Between Groups	22.11	4.42	4.58	0.00**	
Source of Plastics	10th Standard	158	4.72	1.03						
	Up to 12th Std	158	5.02	0.97						
	Graduate	388	5.06	0.94	Within Groups	1151.96	0.96			
	Postgraduate	271	4.93	1.01						
	Professional	122	5.09	0.96						
	Total	1200	4.96	0.98						

Plastics Usage and	Below 10th Std	103	3.12	0.70	Between Groups	2.35	0.47	0.89	N.S.	
Environmental	10th Std	158	3.18	0.76						
Effects	Up to 12th Std	158	3.26	0.73						
	Graduate	388	3.27	0.69	Within Groups	628.70	0.52			
	Postgraduate	271	3.21	0.73						
	Professional	122	3.22	0.73						
	Total	1200	3.23	0.72						

** = Significant at 0.01 level N.S. = Not Significant

From the Table 4 it may be inferred no significant differences among the respondents in terms of their educational status on the awareness on "Plastics and Cancer", "Plastics Disposal", "Plastics Usage and Environmental Effects" sub scales. These results may be due to that, almost every individual, no matter whatever their educational status may be, has got exposed to the knowledge that plastic usage is harmful and it is becoming to be one of the serious environmental problems in future. Besides, plastics as a serious environmental threat have been felt by almost everybody irrespective of their education.

The result shows (Table 4) that respondents who have studied "up to 12th Standard", "Graduates" and "Professionals" are more knowledgeable than respondents whose educational level are "below 10th Standard", "10th Standard" and "Postgraduates" on the "knowledge on the source of plastics". This clearly indicates that education plays a vital role on the knowledge regarding plastics source. The findings align with the conclusions of previous studies by Smith-Sebasto (1995), Oskamp et al. (1998), Hines, Hungerford, and Tomera (1987), Iozzi (1989), Ewert and Baker (2001), Syme, Nancarrow, and Jorgensen (2002), Finger (1994), and Poortinga, Steg, and Vlek (2004). These studies suggest that an individual's awareness of environmental issues and their level of environmental knowledge can vary significantly due to multiple factors, including educational background and personal experiences. *Hence, the hypothesis H3* "There will be a significant difference among the respondents of different educational level with reference to their Awareness on the ill effects of plastics" is partially accepted.

Table 5: Mean, S.D. and ANOVA on Geographical Locale in Awareness of the Ill Effects of Plastics

Awareness	Geographical Locale	N	Mean	S.D.		Sum of Squares	df	Mean Square	F	Sig.
Plastics and Cancer	Metros	208	9.94	2.40	Between Groups	98.95	19.79	3.46	0.00**	
	Cities	201	9.51	2.51						
	Towns	200	9.20	2.29						
	Villages	199	9.21	2.26						
	Small Towns	198	9.81	2.43	Within Groups	6826.80	5.71			
	Tribal Areas	194	9.36	2.42						
	Total	1200	9.51	2.40						

Plastics disposal	Metros	208	7.14	1.21	Between Groups	12.95	2.59	2.08	N.S.	
	Cities	201	7.38	.96						
	Towns	200	7.27	1.04						
	Villages	199	7.15	1.07	Within Groups	1491.61	1.24			
	Small Towns	198	7.24	1.12						
	Tribal Areas	194	7.14	1.25						
	Total	1200	7.22	1.11						
Knowledge of the	Metros	208	4.93	.99	Between Groups	2.25	0.45	0.46	N.S.	
source of plastics	Cities	201	4.98	1.01						
	Towns	200	5.00	0.96						
	Villages	199	4.95	0.98						
	Small Towns	198	5.01	0.95	Within Groups	1171.82	0.98			
	Tribal Areas	194	4.88	1.02						
	Total	1200	4.96	0.98						
	Metros	208	3.24	0.75						
Plastics Usage and	Cities	201	3.26	0.71	Between Groups	1.13	0.22	0.43	N.S.	
Environmental	Towns	200	3.25	0.66						
Effects	Villages	199	3.19	0.72						
	Small Towns	198	3.24	0.72						
	Tribal Areas	194	3.18	0.76	Within Groups	629.92	0.52			
	Total	1200	3.23	0.72						

**= Significant at 0.01 level N.S. = Not Significant

The ANOVA result in Table 5 shows a significant difference among the respondents in terms of their geographical locales with regard to awareness on plastics usage and cancer. However, no significant differences were found in "Plastics Disposal" and "Plastics Usage and Environmental Effects", and "Knowledge on Source of Plastics". Awareness levels of respondents belonging to different geographic locale were the same and the results indicate that the environmental education about the facts of plastics are spread through media might have reached almost all areas, irrespective of rural or urban and therefore the results showed no differences among the respondents.

Hence, the hypothesis H4 "There will be a significant difference among the respondents of different geographical locale with reference to their Awareness on the ill effects of plastics" is partially accepted.

Table 6: Mean, S.D. and ANOVA on Occupational Status in Awareness of the Ill Effects of Plastics

Awareness	Occupational status	N	Mean	S.D.		Sum of Squares	df	Mean Square	F	Sig.
Plastics and Cancer	Student	330	9.41	2.32	Between Groups	52.98	8.83	1.53	N.S.	
	Agriculture	57	9.03	2.02						
	Business	73	9.41	2.39						

	Service	370	9.71	2.51						
	Housewives	247	9.45	2.41	Within Groups	6872.77	5.76			
	Professional	36	10.19	2.38						
	Retired	87	9.32	2.35						
	Total	1200	9.51	2.40						
Plastics Disposal	Student	330	7.31	1.06	Between Groups	9.06	1.51	1.20	N.S.	
	Agriculture	57	7.03	1.25						
	Business	73	7.15	1.17						
	Service	370	7.24	1.10						
	Housewives	247	7.17	1.11	Within Groups	1491.63	1.25			
	Professional	36	6.94	1.41						
	Retired	87	7.25	1.12						
	Total	1200	7.22	1.11						
Knowledge of the	Student	330	5.01	0.93	Between Groups	5.17	0.86	0.87	N.S.	
source of plastics	Agriculture	57	5.03	0.94						
	Business	73	5.04	1.03						
	Service	370	4.94	1.00						
	Housewives	247	4.87	1.02	Within Groups	1168.91	0.98			
	Professional	36	5.11	0.91						
	Retired	87	4.88	1.02						
	Total	1200	4.96	0.98						
Plastics Usage and	Student	330	3.22	0.72	Between Groups	3.98	0.66	1.26	N.S.	
Environmental	Agriculture	57	3.03	0.80						
Effects	Business	73	3.16	0.74						
	Service	370	3.24	0.73						
	Housewives	247	3.24	0.69	Within Groups	627.07	0.52			
	Professional	36	3.22	0.79						
	Retired	87	3.35	0.68						
	Total	1200	3.23	0.72						

N.S. = Not Significant

The results in Table 6 show no significant differences in the occupational status with regard to awareness on "Plastics and Cancer", "Plastics Disposal", "Knowledge of the Source of Plastics" and "Plastics Usage and Environmental Effects". Hence, it may be inferred that irrespective of being a Professional, "Retired" or "Housewives" or "Agriculturist", the awareness of plastics as a pollutant exists. The awareness of the ill effects of plastics has reached all kinds of occupation and it signifies that plastics and its effects are felt by everyone and its environmental effects across generations are understood by almost everyone.

Hence, the hypothesis H5 "There will be a significant difference among the respondents of different occupational status

with reference to their Awareness on the Ill Effects of Plastics" is rejected.

The study on awareness of the ill effects of plastics using the Cancer-Causing Plastics Awareness Scale (CCPAS) revealed widespread knowledge across different demographic groups. Age, gender, education, geographical locale and occupational status showed minimal impact on general awareness, reflecting the extensive reach of environmental education and media. However, age and education did not show significant differences in understanding the source of plastics, highlighting the importance of targeted educational efforts. Gender and occupational status did not affect overall awareness levels, suggesting uniformity in knowledge. These findings emphasize the success of awareness campaigns while also pointing to areas where deeper understanding could be fostered, particularly in the nuanced aspects of plastic hazards.

Conclusion

This study examined the awareness of the ill effects of plastics among different demographic groups in Coimbatore, India, using the Cancer Causing Plastics Awareness Scale (CCPAS). The results indicated that widespread awareness of plastic hazards across all demographics, likely due to media influence and environmental education. However, differences were observed in knowledge of plastic sources, with higher awareness among educated individuals and urban residents. Gender and occupational status had no significant impact on awareness levels. Despite high awareness, plastic use remains prevalent, highlighting a gap between knowledge and behaviour. Future efforts should focus on targeted education, policymaking, and promoting sustainable alternatives to reduce plastic dependency and enhance waste management.

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