

A study of knowledge and practices about single use plastics among residents in UHTC area

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Abstract

Background: Plastics have become a part of everyone's life and Indians are no exception. Plastic packaging accounts for nearly half of all plastic waste globally, and much of it is thrown away within just a few minutes of its first use or Single Use. Plastics pollute air, earth, and water. It is also associated with problems of Immune System, reproductive system, Hormonal disruption etc. **Objectives** of the study were, to study the Knowledge and Practice on Single Use plastic usage, to assess the awareness of residents about Hazards of Plastics and to assess the Perception of Residents about Single Use Plastic Ban. A Community based Cross Sectional Study was conducted in UHTC area by interviewing any adult member (aged above 18 years) in each of the randomly selected households using pretested questionnaire. **Results:** Maximum respondents were from age group 21-30 years 36%, by 31-40 years 28%. Males were 56% and females 44%. Maximum were Hindu 58%, followed by Muslims 21%. Joint Family structure was Observed in 54% households. Maximum were from Socio economic Class III (29.6%), followed by Class IV (27.2%). In respondents housewives were 24%, labourers 20%, skilled job 18% and Students were 16%. In respect to knowledge 76% of participants were knowing single use plastic objects, 88.8% said that plastics cause hazards, 18% said Plastics is degradable, and 84% know about plastic ban out of which 58% know about fine. 74% respondents say that Ban is needed and 86% were in favour of plastic ban. Awareness was significantly associated with age group and education. **Conclusions:** Majority of residents have good knowledge about hazards of single use plastics and aware of Plastic ban. Most of them were in favour of plastic ban still majority of residents don't say no to carry bags.

Keywords: Single Use Plastic, Plastic Pollution, Hazards, Plastic Ban.

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INTRODUCTION

Plastics have become a part of everyone's life and Indians are no exception. Plastic is a miracle material. The benefits of plastic are undeniable. The material is cheap, light

weight and easy to make, which led to a boom in the production of plastic over the past century. Plastic packaging accounts for nearly half of all plastic waste globally, and much of it is thrown away within just a few minutes of its first use. At the end of its lifetime, a product or packaging is recycled, incinerated, landfilled, dumped in uncontrolled sites, or littered in the environment. According to recent estimates, 79% of the plastic waste ever produced now sits in landfills, dumps or in the environment, while about 12% has been incinerated and only 9% has been recycled. Rwanda, a pioneer in banning single-use plastic bags, is now one of the cleanest nations on earth.¹ Production of plastic globally crosses 150 Million tonnes per year. Its broad range of application is in packaging films, wrapping materials, shopping and garbage bags, fluid containers, clothing, toys, household

and industrial products, and building materials. About 70% of plastic packaging products are converted into plastic waste in a short span. In India approximately 9.4 million TPA plastic wastes are generated, Maharashtra is on top in first five. Of this, about 60% is recycled, most of it by the informal sector. The recycling rate in India is considerably higher than the global average of 20%, still over 9,400 tonnes of plastic waste which is either landfilled or ends up polluting streams or groundwater resources. Per capita Plastic consumption is 11 kg in India with global average of 28 Kg. Once plastic is discarded after its utility is over, it is known as plastic waste. Plastic waste never degrades, and remains on landscape for several years. Mostly, plastic waste is recyclable but recycled products are more harmful to the environment as this contains additives and colours. The recycling of a virgin plastic material can be done 2-3 times only, because after every recycling, the plastic material deteriorates due to thermal pressure and its life span is reduced. Hence recycling is not a safe and permanent solution for plastic waste disposal.² Plastics pollutes air, earth, and water. Manufacturing and burning of plastics cause emissions of toxic gases and carcinogens. (Polycyclic aromatic hydrocarbons, dioxin, etc.) The dioxin affects the immune and reproductive system. Hormonal disruption and growth problems are also observed with dioxin. Chemical additives (phthalates) used to make plastic soft and malleable are also dangerous.^{3,4,5} Reduce, Reuse, Recycle, and Recovery is the mainstay in plastic waste management. In India Sikkim was the first state to ban single use plastic bottles, Maharashtra is 18th state in India to ban single-use disposable plastic. Maharashtra has banned disposable products manufactured from plastic and thermocol (polystyrene). Maharashtra plastic ban carries penalties starting at Rs. 5,000 and goes up to Rs 25,000 and 3 months of

imprisonment.² Local bodies are responsible for the management of plastic as per ‘Plastic Waste Management Rules, 2016. This study was carried out to know the knowledge and practice about Single use Plastic in residents of UHTC area.

OBJECTIVES:

Objectives of the study were, to study the Knowledge and Practice on Single Use plastic usage, to assess the awareness of residents about Hazards of Plastics and to assess the Perception of Residents about Single Use Plastic Ban.

METHODOLOGY:

Study Setting: Study was carried out in UHTC area.

Study Design: Community based Cross Sectional Study.

Study Population: Residents in UHTC area of Municipal Corporation Latur. Data collection was by interviewing any adult member (aged above 18 years) in each of the randomly selected households using pretested questionnaire. **SAMPLE SIZE:** Was calculated using formula $n = 4pq/l^2$. In a cross sectional study in Dholpur Rajasthan the prevalence of plastic carry Bag use (In Housewives 45% and Servicemen 40%) was 85% ⁶ P= 85, q=15, l= 5 Sample size comes to 204, However it was decided to take Sample size of 250. With due permission of Ethical committee, a list all houses in field practice area of urban health and training centre area was obtained. Randomly selected houses will be visited and any adult from selected house was interviewed using pre tested questionnaire. **Inclusion criteria:** Residents in UHTC area above 18 yrs. **Exclusion Criteria:** Those residents not willing to participate in study. Data analysis was carried out using the SPSS/PC Windows version 21.0 software package (IBM, Inc.). The results were compared by using the chi square test.

RESULTS AND DISCUSSIONS

Table 1: Distribution of Respondents According to Demographic Characteristics

Distribution of Respondents According to Demographic Characteristics		
Age Wise Distribution	Respondents	Percentage %
Less than 20 Years	05	2%
20-30 Years	90	36%
31-40 Years	70	28%
41- 50 Years	65	26%
51-60 Years	20	8%
Sex Wise Distribution		
Male	140	56%
Female	110	44%
Religion Wise Distribution		
Hindu	145	58%
Muslim	53	21.2%
Buddhist	50	20%
Other	2	0.8%

Type of Family		
Nuclear	70	28%
Joint	135	54%
Three generation	45	18%
Education		
Illiterate	10	4%
Primary	62	24.8%
Secondary	86	34.4%
Higher Secondary	46	18.4%
Graduate	46	18.4%
Socio Economic Class		
I	10	4%
II	31	12.4%
III	74	29.6%
IV	68	27.2%
V	7	2.8%
Occupation		
Housewives	60	24%
Business	25	10%
Service Govt	45	18%
Private Job	30	12%
Students	40	16%
Labourer	50	20%

Maximum respondents were from age group 21-30 years (36%) followed by 31-40 years (28%). Males were 56% and females 44%. Maximum were Hindu 58%, followed by Muslims 21%. Joint Family structure was Observed in 54% households. Socio economic Class III were (29.6%), followed by Class IV (27.2%). Housewives were 24%, labourers 20%, skilled job 18% and Students were 16%.

Table 2: Knowledge of Respondents about Single Use Plastic n=250

	Yes	No	Don't Know
Know Single Use Plastic Products	190 (76%)	60 (24%)	00
Single Use Plastics Causes Hazards	222 (88.8%)	00	28 (11.2%)
Plastic is Degradable	45 (18%)	137 (54.8%)	68 (27.2%)
Plastics Can be Recycled	155 (62%)	23 (9.2%)	72 (28.8%)
Plastic Ban is there in Latur	210 (84%)	17 (6.8%)	28 (11.2%)
Is there any Fine for Violation Of Ban	145 (58%)	10 (4%)	95 (38%)

About 89% of respondents were aware of hazards of single use plastics. 45% were not knowing that plastic is not degradable. 84% were knowing that there is ban on single use plastic in Latur and 38% don't know about fine for violation of plastic ban.

Table 3: Attitude of Respondents about Single Use Plastic (n=250)

	Agree	Do Not Agree	Neutral
Plastic Pollution can be Reduced	227 (90.8%)	23 (9.2%)	00
Reduced Use can reduce Plastic pollution	227 (90.8%)	23 (9.2%)	00
Recycling can reduce plastic pollution	194 (77.6%)	36 (22.4%)	15
Biodegradable Plastics can be alternative	152 (60.8%)	58 (39.2%)	40

Most of participants say Plastic pollution can be reduced (90.8%). Reduced use of plastic is one of the way to reduce plastic use (90.8%). 77.6% respondents were saying that recycling is way for reducing plastic pollution. About 40% respondents were do not agree that biodegradable plastic can be alternative to Single Use plastics.

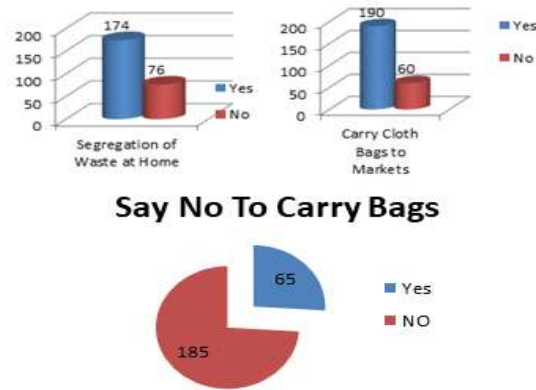


Figure: 1,2 and 3 Practice of respondents about Single Use Plastic (n=250)

About 69% of respondents segregate household waste before giving to waste collector, 76% carry cloth bags to markets and in spite of having knowledge and awareness about hazards of single use plastics 74% respondents don't say no to carry bags.

Table 4: Perception about Plastic Ban (n=250)

	Yes	No
Plastic Ban is Needed	185 (74%)	65 (26%)
Favour Plastic Ban	215 (86%)	35 (14%)

Need of plastic ban was perceived by 74% of respondents and 86% respondents were in favour of plastic ban.

Table 5: Association between Socio demographic factors and Awareness about Plastic hazards

Age Wise Distribution	Respondents	Aware	Not Aware	X ² value, DF*, p-value
Less than 20 Years	20	20	00	X ² value=21.476, df=1, p-value=0.00001 Significant
21-30 Years	75	71	04	
31-40 Years	70	63	04	
41- 50 Years	65	47	12	
51-60 Years	20	12	08	
Sex Wise Distribution				X ² value=0.278, df=1, p-value=0.127 Not Significant
Male	140	127	13	
Female	110	95	15	
Type of Family				X ² value=1.77, df=2, p-value=0.411 Not Significant
Nuclear	70	61	09	
Joint	135	123	12	
Three generation	45	38	7	
Education				X ² value=34.6327, df=4, p-value=0.00001 Significant
Illiterate	10	04	06	
Primary	62	51	11	
Secondary	86	77	09	
Higher Secondary	46	44	02	
Graduate	46	46	00	
Socio Economic Class				X ² value=7.99, df= 4 p-value=0.091676 Not Significant
I	10	10	0	
II	31	29	02	
III	74	65	09	
IV	68	52	16	
V	7	06	01	

There was significant difference between awareness about plastic hazards in young adults and elderly and low level of education and high level of education.

DISCUSSION

In a study by P Rajkumar in Tiruchirapalli Corporation in 2015 it was revealed that 47.8% respondents were from low income group, 27.2% were from middle income group and 25% were from high income group. There was statistical significant difference between high and low income groups about environmental awareness of plastics.⁷ R.Manoj,Chennai city (2019),in study about awareness about single use plastic hazards observed that, there was no statistical difference in awareness about plastic hazards in male and females,employed,unemployed and housewives. But there was statistical difference in awareness between graduates and non graduates, young adulthood and middle adulthood, lower class and middle class and nuclear family and joint family.⁸ In study conducted in Mangalore city by N Joseph and others (2013), 86.44% participants were aware of health hazards of plastics. Awareness was significantly more in females ($p=0.027$), well educated ($p=0.004$) and among professionals and semi-professional ($p<0.001$). Cloth bags were used by 13(5.2%) participants for shopping. 77.9% (166) Participants were in favour of plastic ban. 81.9% knew that plastics are non-degradable and 85% were aware of plastic ban in city.⁹ In Delhi based study 74.5% housewives and 81.5% professionals were aware of health hazards associated with plastic usage, awareness in students was 93% and in lower income groups was 50%.¹⁰ In KAP study in students done in Wardha by Khanam N and others (2018) it was observed that 88.42% students were aware of plastic hazards, 26.32% said that plastics are non-degradable, 37.89% were unaware of Plastic ban in city and 44.2% of students have no idea about fine for violation of plastic ban.³ In another KAP study carried out in Tiruchirapalli Municipal Corporation among residents by R.Vigneshwaran and B. Arunkumar it was found that 40% respondents were between 21-30 years, 50% were males as well as females 71.7% belong to nuclear family, 75% of respondents were having high level knowledge about plastic hazards and plastic usage. There was no significant difference between male and female respondents with regard to knowledge, attitude and Practice.¹¹ In a study conducted in Jimma City of Ethiopia in 2011 by Legesse Adane, it was found that, 76.5% respondents were using plastic bags, 72.6% respondents were males, maximum in 20-29 yrs age group with 54.91% highly educated.¹² 89% of the subjects in this study were aware of health hazard of plastics. This was better than the observations found in studies conducted in India and other parts of the world where 50% to 81.1% participants were aware of associated health hazards^{10,12,13,14}. The findings in our study were consistent with most of the studies there was significant difference between awareness about plastic

hazards in young adults and elderly and low level of education and high level of education.

CONCLUSIONS

Maximum number of residents were having knowledge about hazards of single use plastics and aware of Plastic ban. Many of them carry cloth bags to markets. Most of them were in favour of plastic ban still majority of residents don't say no to carry bags.

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