

# CONSUMER REFLECTIONS ON THE USAGE OF PLASTIC BAGS, THEIR DISPOSAL AND ADVERSE EFFECTS ON HUMAN HEALTH AND ENVIRONMENT

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## ABSTRACT

**Aim:** To assess the knowledge about the health and environmental risks associated with the use of plastic bags among the users and their perception towards the legislation banning the use of plastic bags.

**Study setting and Subjects:** Adult costumers visiting randomly chosen markets in the seven residential phases of Hayatabad Township Peshawar Pakistan.

**Study design and duration:** Cross sectional study conducted from November 2018 to February 2019.

**Methodology:** Data was collected from every 3<sup>rd</sup> costumer (60/market) coming to 7 out of 49 randomly chosen markets of the township after pilot testing. After rejection of ten incomplete questionnaires, 410 were analyzed using SPSS version 20.

**Results:** Mean age of the participants was 32.2±13.4 years, with the majority (62.7%) being males. Respondents were mostly educated. Among the participants 82.2% knew that plastic release carcinogenic substances especially when hot food items are packed in it; 72.7% were in favor of using biodegradable plastic bags, while 94% were agreed to use cloth bags instead. 84% responded in favor of the legislation banning the use of single use plastic bags but in practice 94.4% respondents were using plastic bags.

**Conclusion:** Majority of the respondents were aware of the indiscriminate use and harmful effects of plastic bags ending up as solid waste and posing serious threat to human and animal health and the environment. Also, most participants were in favour of a ban on the use of single use plastic bags but at the same time their practices with respect to the usage of alternative eco-friendly bags like paper, jute, or cloth were found poor. Awareness campaigns, effective implementation of the legislation and availability of cloth or jute bags at affordable prices can prove to be helpful in minimizing the use of plastic bags.

**Keywords:** plastic bags, adverse effects, waste-management, safe disposal, legislation.

## INTRODUCTION

The world's first synthetic plastic was invented in New York in 1907<sup>1</sup>. Since then owing to its versatile properties of being inexpensive, light weight, strength, corrosion resistance, durability, high thermal and electrical insulation properties; plastic industry has revolutionized the fields of medicine, technology, household commodities, clothing, and packaging etc.<sup>2,3</sup> Due to its widespread use, manufacture of plastic products has risen to 407 million tonnes (MT) globally in 2015, of which 164 MT (36%) was utilized for packaging. It is reported that packaging amounts to one third of plastic consumption globally, of which around 40% ends up in landfills and there it takes from 15 to 1000 years to biodegrade; posing a risk to human health, waste-management problems, environmental damage and contamination of soil and groundwater by persistent organic pollutants (break down by-products of plastics)<sup>3-5</sup>.

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The use of plastics for packaging in both domestic and commercial sectors in the UK was estimated to be 40 kg/person/year in 2003, which formed approximately 7-8% by weight of Municipal solid waste<sup>3</sup>. Besides blocking the sewerage systems and causeways, the littered plastic bags provides breeding grounds for mosquitoes after collection of rain water inside them; therefore, worsening the spread of vector borne diseases like malaria, leishmaniasis, dengue fever etc. especially in tropical and subtropical countries<sup>5</sup>.

Plastic bags or pouches used to parcel hot or cold food items poses a health risk to the consumers by releasing Styrene, Phthalates and Bisphenol A, which are considered risk factors for causing cancer, diabetes and diseases of the heart and liver<sup>5,6</sup>.

The human, animal and environmental impacts have risen global concerns and anti-plastic shopping bag legislations and campaigns have emerged in many countries in recent years. Different strategies like recycling, taxes or fees on getting plastic bags from stores or shopping malls, incineration, banning the production of single-use plastic bags and introduction of paper or cloth bags are being implemented in the EU and USA<sup>7-10</sup>.

Research has been conducted in many developing and even under developed countries to assess the knowledge, behaviors and practices of the citizens regarding health and environmental hazards of plastic bags and their safe disposal<sup>6,11</sup>. Like India, Bangladesh, Malaysia, Ethiopia and many other countries Pakistan has also passed a legislation in 2013 to ban the manufacture, import, sale and use of non-biodegradable plastic bags and introduction of oxo biodegradable bags<sup>5,6,11,12,13</sup>. Studies show that a large number of people are not bothered about the deterioration of the natural beauty and environmental pollution caused by the plastic bags ending up in landfills. Moreover, poor implementation of the legislation has made the ban on plastic bags usage largely ineffective<sup>6,14</sup>. With this background, this survey was done in Peshawar, a rapidly expanding city in Khyber Pakhtunkhwa province of Pakistan, to find out the usage pattern and reasons of popularity of plastic bags among consumers. The study also assessed the knowledge about the health and environmental risks associated with the use of plastic bags among the users and their perception towards the legislation banning the use of plastic bags.

## OBJECTIVES

To assess the knowledge score of adults on hazards of plastic bags and their safe disposal.

To record the behaviors and practices of consumers relating the usage of plastic bags.

To assess their perceptions towards the legislation prohibiting the usage of plastic bags.

## METHODOLOGY

A Cross-sectional study was conducted in Hayatabad township, Peshawar Pakistan from November 2018 to February 2019. There were 49 markets in 7 housing phases of the township. One market each was selected randomly from each phase. Data collectors visited the markets for four consecutive days to administer a structured questionnaire to every 3<sup>rd</sup> adult aged more than 18 years (male or female) costumer coming to different shops after explaining the purpose of the survey and getting a verbal consent. If that costumer refused, next

costumer was requested to participate. A total of 420 questionnaires were filled (60/market), but after rejection of ten incomplete questionnaires, 410 were analyzed using SPSS version 20. Pilot testing was done among 20 conveniently chosen participants before embarking on the actual survey. Those respondents who were willing to participate in the study but were unable to fill the questionnaire by themselves were helped by the data collectors.

## RESULTS

Mean age of the participants was 32.2 $\pm$  13.4 years, with the majority (62.7%) being males. The respondents were mostly educated with 80.6% having intermediate or above level of education. Students, unemployed and housewives constituted 53.2% of the sample size.

Among the participants 82.2% knew that plastic release carcinogenic substances especially when hot food items are packed in it; 72.7% were in favor of using biodegradable plastic bags, while 94% were agreed to use cloth bags instead. Regarding the question in the behaviors section about the reasons of not using a reusable or cloth bag; the following responses were collected (table).

Out of the total, 84% responded in favor of the legislation banning the use of single use plastic bags, whereas 16% opposed it.

In the practices section 94.4% respondents said that they use plastic bags and only 5.6% reported using cloth bags for shopping.

## DISCUSSION

The results showed that regardless of their demographic background most of the respondents knew about the adverse effects on animal and human health and environmental hazards of single use plastic bags like studies done in India, Ethiopia, Europe and USA<sup>5,10,11,15</sup>.

Among the participants 82.2% knew that plastic release carcinogenic substances especially when hot food items are packed in it; contrary to a study done in

**Table 1: Knowledge of the respondents about benefits and hazards of plastic bags**

	Percent
helps to carry things easily	13.9%
light and affordable	10.6%
helps to store things	7.0%
chokes sewer systems, canals& rivers	28.7%
animals mistake it as food	19.3%
can suffocate children	20.5%
Total	100.0%

**Table 2: Views of the respondents on usage and disposal of plastic bags and its alternative solutions**

	<b>Agree</b>	<b>Disagree</b>	<b>Don't know</b>
People in Pakistan are not disposing off their plastic bags appropriately	86.8%	8.5%	4.6%
There are too much plastic bags used in Pakistan	87.1%	7.1%	5.9%
Shops in Pakistan should stop using plastic bags and introduce bringing your own bags for shopping	86.3%	9.0%	4.6%
Costumers should use cloth bags instead of plastic bags	92.9%	4.4%	2.7%
A law should be implemented to stop people using plastic bags at all	82.9%	8.8%	8.3%

**Table 3: Reasons for not using a cloth bag for shopping**

	<b>Percent</b>
Too expensive	15.3%
Prefer plastic	11.9%
forget to bring cloth bags	39.3%
need plastic for other uses	20.5%
unsure	7.9%
Nothing, already using reusable bags	5.2%
Total	100.0%

**Table 4: Impact of a ban/fee imposed on plastic bags in markets of Hayatabad on costumer behavior**

	<b>Responses</b>
	<b>Percent</b>
Would start using cloth bags	62.2%
Lessen use of plastic bags	22.7%
Pay fee to buy plastic bags	4.0%
Shop elsewhere	1.9%
It will be worrying for me	7.4%
No effect; already use reusable bags	1.9%
Total	100.0%

**Table 5: Number of bags used by respondents in a week**

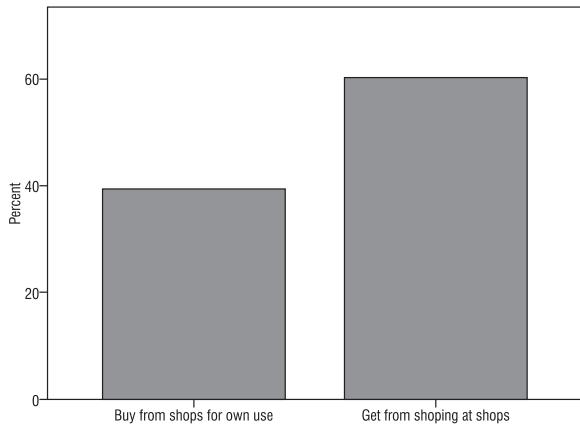
	<b>Percent</b>
Less than 5	19.0
6-10	36.6
More than 10	44.4
Total	100.0

Malaysia, which showed lack of knowledge among the consumers regarding this issue<sup>6</sup>.

Those respondents who were in favor of using biodegradable plastic bags (72.7%) or cloth bags (94%) were in large number, which was a positive sign and if the government imposes a ban on single use plastic bags; the public can readily be expected to start using

**Table 6: Consumer practices after getting plastic bags**

	<b>Percent</b>
Reuse for dustbins	36.6%
Reuse for shopping	9.1%
Store and carry things	26.2%
Keep for recycling	4.5%
Burn	4.6%
Throw away	19.1%
Total	100.0%



**Figure 1: How do customer usually obtain plastic bags**

cloth bags. Moreover, awareness campaigns using social and mass media and displaying banners in main markets of the township could be effective in sensitizing the public on the use of alternate eco-friendly bags. A sizeable proportion of the consumers (87%) reported that there was excessive use of plastic bags which were not properly disposed off and littered on the sides of roads and streets as reported in many other studies around the world<sup>5,11,17,14,11</sup>. The commonest reasons for not using a cloth bag for shopping were forgetting to bring cloth bags followed by need of plastic bags for other purposes and cloth bags being expensive. Awareness campaigns supported by the government to educate citizens to start using cloth bags for shopping shall be helpful in lessening the number of plastic bags going to landfills and adding to municipal solid waste.

In our study, 84% of the consumers were in favour of a legislation imposing a ban on the use of plastic bags similar to the findings of some studies done in USA, Europe, Ethiopia and India<sup>15,9,11,5</sup> which shows that if the government implements the ban in letter and spirit, awareness campaigns are being run periodically and alternate solutions like paper or cloth bags made available; then the public would be expected to stop or lessen the use of plastic bags.

## CONCLUSION AND RECOMMENDATIONS

Majority of the respondents were aware of the indiscriminate use and harmful effects of plastic bags ending up as solid waste and posing serious threat to human and animal health and the environment. Also, most participants were in favour of a ban on the use of single use plastic bags but at the same time their practices with respect to the usage of alternative eco-friendly bags like paper, jute, or cloth were found poor. Awareness campaigns, effective implementation of the legislation and availability of cloth or jute bags at affordable prices can prove to be helpful in minimizing the use of plastic bags.

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