IJNH

Review Article

Health Hazards of the Plastic Use: Strategies to Handle the Situation

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Abstract

It is evident that plastics bring many societal benefits and offer future technological and medical advances. However, concerns about health hazards are diverse and include accumulation of waste in landfills and natural habitats, physical problems for wildlife resulting from ingestion or entanglement in plastic, the leaching of chemicals from plastic products, and the potential for plastics to transfer chemicals to wildlife and humans. Importantly, toxins that frequently appeared in water samples from there used bottles were diethylhexyl phthalate, a carcinogen regulated in drinking water because it has been found to cause many health issues. In this review, we will discuss different issues related to health hazards of the plastic use and strategies to deal with.

Keywords: Health, health hazards, nursing, plastics

Introduction

Plastic bags have been introduced in the 1970s (Williamson, 2003) and gained an increasing popularity among consumers and retailers.[1] They are available in huge numbers and varieties across the world. It is estimated that around 500 billion plastic bags are used every year worldwide.[2] This widespread utilization is attributed to their cheapness and convenience to use. The vast majority of these bags are discarded as wastes usually after a single use. It is also believed that after their entry into environment, plastic bags can persist up to 1000 years without being decomposed by sunlight and/or microorganisms.[3]

Accumulation of plastic bag wastes causes environmental pollution that can be manifested in number of ways. One of the problems is deterioration of natural beauty of an environment. Another common problem associated with these wastes is the death of domestic and wild animals. This necessitates for proactive measures to safeguard animal species against extinction.[4] Blockage of sewerage systems is becoming a common problem in cities and towns of developing countries. This, in turn, creates foul smells and favorable habitats for mosquitoes and other vectors that could spread a large number of diseases such as encephalitis, dengue fever, and malaria.[5]

If plastic bags get access to agricultural fields, they reduce percolation of water and proper aeration in soil. This results in reduction of productivities of such fields. Furthermore, in several poor and developing countries, these bags are frequently used to carry food items. This practice can cause serious health problems since some carcinogenic agents could be generated during the chemical reactions that take place in plastic materials (for example, coloring agents) and the food items due to temperature variations. In recent reports, it has been mentioned that reuse of plastic bags can cause cross-contamination of foods by microorganisms.[6] Moreover, plastic bags are also used for disposing of human and other domestic wastes which make human health more risky as compared to "open" disposal of these wastes.[7]

Plastics are inexpensive, lightweight, strong, durable, corrosion-resistant materials, with high thermal and electrical insulation properties. The diversity of polymers and the

Access this article online
Website: http://innovationalpublishers.com/Journal/ijnh
ISSN No: 2454-4906
DOI: https://doi.org/10.31690/ijnh/37

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versatility of their properties are used to make a vast array of products that bring medical and technological advances, energy savings, and numerous other societal benefits. As a consequence, the production of plastics has increased substantially over the past 60 years from around 0.5 million tonnes in 1950 to over 260 million tonnes today.

Knowledge and Attitude of Health Hazards of Plastic Use

Joseph *et al*. found out the status of awareness of the health hazards associated with the usage of plastic bags among people and their perception toward the legislation prohibiting the usage of plastic bags. This cross-sectional study conducted in Mangalore city in August 2013. They found that most of the participants in the settings had the awareness of hazards of plastic bag usage. However, there is a need for spreading the awareness of using alternative strategies and effective implementation of legislation to minimize the usage of plastics in the community.[8]

An Ethiopian study[9] reported 59.6%, a study done in Dholpur town, Rajasthan,[10] reported that 40% and in another study done in Tiruchirapalli City, Tamil Nadu,[11] reported that 43.1% of participants used to litter plastic bags in open. The better litter rate in these studies could be due to low awareness of the hazards of plastic bags compared to other studies on issues like non-biodegradable nature of plastic bags among people.

In a study done in Delhi, only 4.6% of participants used to carry own plastic bags for shopping. The above study also reported that among the people who used to get their own bags, the proportion of females 11.9% using reusable bags was more than males 9.7% and it was similar to our findings.[12]

Gupta and Somanathan reported that 89% of consumers admitted that they started imitating others who were carrying own bags for shopping.[12] This was like setting a good example for others for minimizing plastic bag utilization.

Even though reusing of plastic bags leads to less generation of waste, this strategy has been framed as unhygienic. Studies have found that 97% of shoppers have been reusing plastic bags in Los Angeles, San Francisco, and Tucson, USA, without washing them. These reusable bags carried harmful bacteria which cause cross-contamination of food packed in it, thereby threatening human health.[13] There have been reports of *Escherichia coli* identified in 8% of reused bags along with several enteric bacteria and other opportunistic pathogens in recent study by Williams *et al*.[14]

Hence, if reusing bags are to be promoted as a strategy to minimize the utilization of plastic bags, then the periodic washing of the bags should also be made mandatory for the customers.

The alternatives for plastic bags such as jute bags and paper bags were suggested by a few participants in this study. In another study done in Delhi, 57.6% of users suggested cloth/jute as alternatives for plastic bags while 40.3% suggested paper bags.[15] The other alternatives could be polypropylene bags, biodegradable bags made of cornstarch, and sisal bags, which are quite durable and, hence, can also be reused.

Even though most consumers were aware of the hazards associated with the usage of plastic bags and some of them even had an idea of alternative eco-friendly bags, hardly 5% of participants in the present study were using eco-friendly bags. This was much lesser than the observations of a study done in California, USA, where 30.2% were using the paper bags.[13] Hence, the provision of suitable bags such as cloth/jute/paper bags in market places at a subsidized price would improve the practice if the customer forgets to get one from home. This strategy has been reported to reduce the utilization of plastic bags by 90% in Ireland[16] and by 49% in China.[17]

Xing observed that following the implementation of ban on free plastic bags in China, the use of plastic bags reduced dramatically and so also improved the public awareness of environmental protection.[18]

Conclusion

Most of the participants in the settings had the awareness of health hazards of the usage of plastic bags and supported its ban. However, practices with respect to the usage of alternative bags or reuse of already used bags were found poor among majority of the participants. Awareness generation on these strategies and effective implementation of legislation may help in reducing the usage of plastic bags in the community.

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How to cite this article: Praveena BG. Health Hazards of the Plastic Use: Strategies to Handle the Situation. Innov J Nurs Healthc. 2019;5(3):31-33.