

Microplastic Leaching from PET Bottles in Dhaka: A Quantitative Study of Public Awareness, Risk Perception, and Behaviour-Based Exposure

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Abstract

Microplastic contamination from polyethylene terephthalate (PET) bottles has emerged as a growing public health concern, particularly in regions where bottled beverages are widely consumed, and reuse practices are common. This study examines how public awareness of microplastics and perceived health risk are related to real-world PET bottle reuse behavior in Dhaka. A quantitative, cross-sectional survey was conducted using an online questionnaire, receiving 133 valid responses. The questionnaire captured three constructs: factual awareness via a knowledge quiz, perceived health risk using Likert scale items, and a behavior-based exposure score reflecting reuse, mechanical stress and storage conditions. Spearman's rank correlations revealed a weak but statistically significant inverse relationship between awareness and exposure ($\rho = -0.171$, $p = 0.049$), and a weak positive link between awareness and perceived risk ($\rho = 0.230$, $p = 0.008$). In contrast, risk perception did not reliably predict exposure ($\rho = -0.127$, $p = 0.145$). These findings suggest that greater knowledge raises concern but does not automatically translate into safer reuse practices. The study recommends that public health interventions combine informational campaigns with clear, practicable reuse guidelines and structural support to reduce PET derived microplastic intake in Bangladesh.

Keywords: microplastics (MP); polyethylene terephthalate (PET); behavior-based exposure; risk perception; awareness