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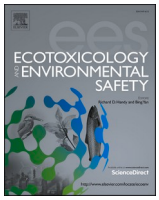

Public perception on human exposure risk: A case study on endocrine disrupting compounds in the environment

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ABSTRACT

Humans are exposed to environmental risks owing to the broad usage of endocrine disrupting compounds (EDCs). However, the subjective evaluation of risk levels and characteristics, as well as the variation in risk processing, have not been thoroughly examined. The objective was to understand the public's perception of the risk associated with human exposure to environmental EDCs and identify any variations in risk perception. In this pioneering study conducted within the distinctive social and cultural context of Malaysia, a developing nation, a quantitative analysis approach was employed to assess the subjective evaluation of risk levels and characteristics among the public while developing a risk perception model. Data gathered from surveys and questionnaires were analyzed to gather information on the public's perception of environmental and health issues pertaining to pesticides, hormones, plastics, medicines, and cosmetics. The analysis revealed that the majority of the public assessed the level of human exposure to environmental risks based on experiential processing, which was influenced by cognitive and affective variables. Interestingly, a higher proportion of individuals in the community had a low risk perception of environmental EDCs, surpassing the overall risk perception by 19.3%. Furthermore, the public showed significant awareness of environmental and health issues related to pesticides, hormones, and plastics but had a lesser inclination to acknowledge the vulnerability of humans to risks associated with medicines and cosmetics. These findings suggest that the public is likely to be exposed to environmental EDCs based on their current perceived risks, and that sociopsychological factors play a significant role in shaping perceptions and judgments. This understanding can inform the development of targeted risk management strategies and interventions to mitigate the potential harm caused by environmental EDCs.

1. Introduction

Endocrine disrupting compounds (EDCs) have been extensively used as flame retardants, surfactants, plasticizers, fragrances, pharmaceuticals, additives, and pesticides, and have emerged as contaminants that can disrupt the endocrine system upon exposure (Wee and Aris, 2017). EDCs are present in trace concentrations in the global environment and pose potential health risks to the individuals and populations exposed to them. These risks primarily involve disruption of the endocrine system, such as the induction of xenobiotic metabolism, hormone-mediated modes of action, and oxidative stress response, impacting growth and development and causing behavioral changes, reproductive disorders (infertility and infecundity), reduced immunity, cardiometabolic diseases, and neurological disabilities (Priyadarshini et al., 2023; Rosenmai et al., 2018; Wee and Aris, 2017). Diseases such as diabetes, obesity, and cancer, which have a significant impact on global health, are often associated with endocrine dysfunction (Giulivo et al., 2016; Priyadarshini et al., 2023; Wee and Aris, 2017). Furthermore, EDCs commonly exist in the form of mixtures that exhibit higher toxicity than individual compounds owing to their combined effects (Wee et al., 2019).

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