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From Awareness to Action: A Critical Review of Public Knowledge and Behavioral Gaps in Addressing Plastic Pollution

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Abstract

Plastic pollution is a global crisis. Although public awareness of plastic pollution is high, meaningful action remains limited. This review explores the reasons behind this gap. We synthesized recent literature between 2020–2025 on public knowledge, attitudes, and behaviors related to plastic pollution using a structured review methodology. Findings show that while people recognize the problem, their understanding is often narrow. Many focus on visible items like bottles and bags. Few know about microplastics from clothes or tires. This incomplete knowledge limits effective responses. Key barriers to action include convenience, cost, social norms, and distrust in recycling systems. Health concerns and local impacts are stronger motivators than general environmental worry. Effective communication must address these factors.

This review concludes that awareness alone is insufficient. We need strategies that target behavioral change. Education should build complete understanding and practical skills. This approach is essential to effectively bridge the gap between awareness and action.

Keywords: Plastic Pollution; Awareness-Action Gap; Behavior Change; Public Knowledge; Risk Perception; Environmental Communication; Microplastics; Education

1. Introduction

Plastic pollution affects every part of our world. It harms oceans, soil, air, animals, and human health[1]. The problem is getting worse. Even with more research and media coverage, plastic waste keeps increasing[2]. One key reason is the disconnect between public awareness of plastic pollution and the adoption of sustained pro-environmental behaviors ("awareness-action gap"). People know about plastic pollution, but they do not change their behavior enough[3].

Public understanding tends to focus on obvious items like plastic bags and bottles[4]. Less visible sources are often overlooked. These include microfibers from clothes, particles from tires, and fragments from paints[5]. This limited view affects how people respond. They may recycle a bottle but not realize their laundry releases plastic into water.

Education is crucial for change. Schools can shape attitudes and behaviors from a young age, as demonstrated in community-based studies within UNESCO-associated regions[6]. Many programs now teach about plastic pollution. But we do not know enough about what works and which approaches actually lead to long-term behavior change. This review aims to fill that gap by the following aims & objectives.

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- To Summarize public knowledge levels about plastic pollution
- To Identify barriers to behavior change
- To Highlight factors that motivate action
- To Suggest ways to improve education and communication

2. Methodology

A structured review of recent literature was conducted. The search was performed in PubMed for articles published between 2020 and 2025 using search terms such as "plastic pollution awareness," "public knowledge," "behavior change," and "microplastics." Review articles, survey studies, and intervention reports were included. Non-English publications and theoretical essays without empirical data were excluded. The screening process involved an initial review of titles and abstracts, followed by a full-text assessment of relevant papers. Key findings pertaining to public knowledge, barriers to action, and motivating factors were extracted and subsequently grouped into thematic categories. This analytical approach facilitated the identification of patterns across the selected studies.

3. Results and Discussion

Summary of key findings listed in Table 1.

3.1. Public Knowledge: Broad but Shallow

Survey data show that most people recognize plastic pollution as a serious issue[4]. Many are aware of visible impacts like ocean plastic and harm to wildlife[7]. But knowledge is often basic. Studies indicate low public awareness of microplastics and their health effects[8]. Few people realize that washing synthetic clothes releases plastic fibers[9], or that tire wear contributes to water pollution[5]. This incomplete understanding limits effective public response to plastic pollution. Many believe that recycling is the primary solution without realizing how little plastic is actually recycled globally[10]. This overconfidence in recycling systems may reduce motivation to reduce plastic consumption.

3.2. Barriers to Action

Why don't people act on what they know? Studies point to several interconnected barriers:

- Habit and convenience: Plastic is deeply embedded in daily routines, as seen during the COVID-19 pandemic when single-use plastic surged for safety and convenience[11], [12].
- Economic and systemic barriers: High costs and limited infrastructure for plastic recycling hinder sustainable waste management[13], [14].
- Social norms: People follow what others do. If peers use plastic, they are likely to do the same[15].
- Systemic challenges in waste management: In many regions, particularly in the Global South, effective plastic waste reduction is hampered by inadequate infrastructure, a lack of recycling facilities, and poor regulatory enforcement[16].
- Distrust and confusion: Many doubt recycling systems work. Labels can be unclear[4], [15].

3.3. What Motivates Action

Certain factors do lead to change:

- Health concerns: Fear of microplastics in food or water is a strong motivator[17], [18].
- Local and visible impacts: People respond more to pollution they can see in their community[19].
- Social influence: Friends, family, and trusted leaders can model good behavior[20].
- Clear guidance: People act when given specific, achievable steps[20].

3.4. Communication Strategies

Telling people “Plastic is bad" is not enough. Effective messages should:

- Focus on health risks, not just environmental harm[8], [17]
- Provide simple, actionable tips[12], [20]
- Use trusted messengers (doctors, teachers, local leaders)[20], [21]

Table 1 Summary of Public Knowledge, Barriers, and Motivators Related to Plastic Pollution

Theme	Key Finding
Knowledge Level[4]	High awareness of visible plastic; low awareness of microplastics & diffuse sources
Top Barriers[22]	Convenience, cost, social norms, distrust in systems, low self-efficacy
Key Motivators[8]	Health concerns, local visible impacts, social influence, clear guidance
Effective Communication[7]	Health-focused messaging, actionable steps, trusted messengers, local relevance

4. Emerging Issues

New challenges are emerging, complicating the plastic pollution crisis.

- **The COVID-19 pandemic increased plastic use for safety.** The pandemic caused a significant resurgence in single-use plastics, particularly personal protective equipment (PPE), reversing prior reduction progress and overwhelming waste systems[23].
- **"Biodegradable" plastics may not break down safely in all environments.** Biodegradable plastics require specific end-of-life conditions (e.g., industrial composting) to degrade as intended and are not a solution for uncontrolled environmental litter. Concerns also exist about their additives and ecotoxicity[24].
- **Agricultural plastic use is growing, adding to soil pollution.** Plastics, especially mulch films, are accumulating in agricultural soils, contributing to microplastic contamination and potentially affecting soil health and food security[25].
- **Public awareness of these specific issues remains low.** While awareness of general plastic pollution is high, understanding of nuanced issues like biodegradable plastic limitations, agricultural plastic leakage, and the full environmental cost of pandemic-related plastic surge is limited[21].
- **Research methods are also advancing. Better tools are needed to detect tiny plastic particles.** Standardized, sensitive methods are required to accurately detect and quantify micro- and nanoplastics across environmental matrices, which is crucial for realistic exposure and risk assessment[26].

Advancing detection capabilities is essential to move beyond laboratory studies and assess the actual ecological and human health risks posed by plastic pollution at environmentally relevant concentrations.

5. Implications for Education

The findings of this review have direct relevance for educators, curriculum designers, and those developing school-based environmental programs. Simply teaching facts about plastic pollution is insufficient. Effective education must bridge the awareness-action gap by addressing the barriers and motivators identified here.

Educational programs should:

- Teach beyond bottles and bags: Include microplastics from textiles, tires, and agriculture to build complete understanding.
- Focus on health and local impacts: Use health risks and visible local pollution as engaging entry points, not just distant environmental concerns.
- Build practical skills: Move beyond awareness to teach concrete skills like waste sorting, sustainable purchasing, and advocating for change.
- Foster a sense of agency: Design activities that show students their actions matter, both individually and collectively.
- Connect to systems: Help learners understand the full life cycle of plastic and the policies needed for large-scale change.

School-based interventions are uniquely positioned to shape long-term behaviors. By integrating these insights, educators can create learning experiences that not only inform but also empower students to become part of the solution.

6. Conclusion

Awareness alone will not solve plastic pollution. We must address the barriers that stop people from acting. Solutions should:

- Make sustainable choices easier and cheaper
- Improve trust in waste systems
- Use health messages to motivate action
- Work at community level

Future efforts should focus on behavior, not just knowledge. Researchers, educators, and policymakers must work together. Only then can we close the gap between knowing and doing.

Limitations

This review has several limitations. First, it focuses on literature from 2020–2025, which may exclude earlier foundational studies. Second, included studies are primarily English-language, which may limit global representativeness. Third, most data come from survey self-reports, which can differ from actual observed behaviors. Finally, this review emphasizes social and behavioral aspects, with less focus on technical or policy solutions. These limitations suggest cautious interpretation and highlight areas for future research.

Compliance with ethical standards

Disclosure of conflict of interest

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Author Contributions

- Nirmala Chandrasekaran: Conceptualization, writing, editing, Literature review, formatting.
- Saranya Jaikumar: Conceptualization, writing, editing, Literature review, formatting
- Sai Saindhavi: Conceptualization, Literature review, drafting and editing under supervision

References

[1] MacLeod M, Arp HP, Tekman MB, Jahnke A. The global threat from plastic pollution. Science. 2021 Jul 2;373(6550):61-5.

[2] Borrelle SB, Ringma J, Law KL, Monnahan CC, Lebreton L, McGivern A, Murphy E, Jambeck J, Leonard GH, Hilleary MA, Eriksen M. Predicted growth in plastic waste exceeds efforts to mitigate plastic pollution. Science. 2020 Sep 18;369(6510):1515-8.

[3] Iroegbu AO, Ray SS, Mbarane V, Bordado JC, Sardinha JP. Plastic pollution: a perspective on matters arising: challenges and opportunities. ACS omega. 2021 Jul 23;6(30):19343-55.

[4] C. Caminiti, F. Diodati, M. Puntoni, D. Balan, and G. Maglietta, "Surveys of Knowledge and Awareness of Plastic Pollution and Risk Reduction Behavior in the General Population: A Systematic Review," Feb. 01, 2025, Multidisciplinary Digital Publishing Institute (MDPI). doi: 10.3390/ijerph22020177.

[5] P. Jan Kole, A. J. Löhr, F. G. A. J. Van Belleghem, and A. M. J. Ragas, "Wear and tear of tyres: A stealthy source of microplastics in the environment," Oct. 20, 2017, MDPI. doi: 10.3390/ijerph14101265.

[6] R. Mashamba, M. T. B. Dalu, R. N. Cuthbert, F. Dondofema, and T. Dalu, "Human perceptions and reports of pro-environmental behaviours in the context of plastic pollution in rural communities within a UNESCO subtropical biosphere reserve," J Environ Stud Sci, vol. 15, no. 3, pp. 503–515, Sep. 2025, doi: 10.1007/s13412-024-00957-7.

[7] P. Karak, A. Parveen, A. Modak, A. Adhikari, and S. Chakrabortty, "Microplastic Pollution: A Global Environmental Crisis Impacting Marine Life, Human Health, and Potential Innovative Sustainable Solutions," Jun. 01, 2025, Multidisciplinary Digital Publishing Institute (MDPI). doi: 10.3390/ijerph22060889.

[8] I. Donisi, A. Colloca, C. Anastasio, M. L. Balestrieri, and N. D'onofrio, "Micro(nano)plastics: an Emerging Burden for Human Health," 2024, Ivyspring International Publisher. doi: 10.7150/ijbs.99556.

[9] D. M. C. Ellos et al., "Mesoplastics: A Review of Contamination Status, Analytical Methods, Pollution Sources, Potential Risks, and Future Perspectives of an Emerging Global Environmental Pollutant," Mar. 01, 2025, Multidisciplinary Digital Publishing Institute (MDPI). doi: 10.3390/toxics13030227.

[10] M. G. Kibria, N. I. Masuk, R. Safayet, H. Q. Nguyen, and M. Mourshed, "Plastic Waste: Challenges and Opportunities to Mitigate Pollution and Effective Management," Feb. 01, 2023, Springer Science and Business Media Deutschland GmbH. doi: 10.1007/s41742-023-00507-z.

[11] N. Parashar and S. Hait, "Plastics in the time of COVID-19 pandemic: Protector or polluter?," Mar. 10, 2021, Elsevier B.V. doi: 10.1016/j.scitotenv.2020.144274.

[12] D. Winton, L. Marazzi, and S. Loiselle, "Drivers of public plastic (mis)use — New insights from changes in single-use plastic usage during the Covid-19 pandemic," Science of the Total Environment, vol. 849, Nov. 2022, doi: 10.1016/j.scitotenv.2022.157672.

[13] S. Kahlert and C. R. Bening, "Plastics recycling after the global pandemic: resurgence or regression?," Sep. 01, 2020, Elsevier B.V. doi: 10.1016/j.resconrec.2020.104948.

[14] N. Ebner and E. Iacovidou, "The challenges of Covid-19 pandemic on improving plastic waste recycling rates," Oct. 01, 2021, Elsevier B.V. doi: 10.1016/j.spc.2021.07.001.

[15] A. Kollmuss and J. Agyeman, "Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior?," Environ Educ Res, vol. 8, no. 3, pp. 239–260, 2002, doi: 10.1080/13504620220145401.

[16] S. Hossain, M. A. Rahman, M. A. Chowdhury, and S. K. Mohonta, "Plastic pollution in Bangladesh: A review on current status emphasizing the impacts on environment and public health," Dec. 01, 2021, Korean Society of Environmental Engineers. doi: 10.4491/eer.2020.535.

[17] Y. Li, L. Tao, Q. Wang, F. Wang, G. Li, and M. Song, "Potential Health Impact of Microplastics: A Review of Environmental Distribution, Human Exposure, and Toxic Effects," Oct. 20, 2023, American Chemical Society. doi: 10.1021/envhealth.3c00052.

[18] H. A. Leslie and M. H. Depledge, "Where is the evidence that human exposure to microplastics is safe?," Environ Int, vol. 142, Sep. 2020, doi: 10.1016/j.envint.2020.105807.

[19] G. G. N. Thushari and J. D. M. Senevirathna, "Plastic pollution in the marine environment," Aug. 01, 2020, Elsevier Ltd. doi: 10.1016/j.heliyon.2020.e04709.

[20] M. C. Monroe, R. R. Plate, A. Oxarart, A. Bowers, and W. A. Chaves, "Identifying effective climate change education strategies: a systematic review of the research," Environ Educ Res, vol. 25, no. 6, pp. 791–812, Jun. 2019, doi: 10.1080/13504622.2017.1360842.

[21] B. R. Baechler, H. De Frond, L. Dropkin, G. H. Leonard, L. Proano, and N. J. Mallos, "Public awareness and perceptions of ocean plastic pollution and support for solutions in the United States," Front Mar Sci, vol. 10, 2023, doi: 10.3389/fmars.2023.1323477.

[22] P. Y. Vélez-Terreros, D. Romero-Estévez, and G. S. Yánez-Jácome, "Microplastics in Ecuador: A review of environmental and health-risk assessment challenges," Jan. 15, 2024, Elsevier Ltd. doi: 10.1016/j.heliyon.2023.e23232.

[23] M. Ardusso, A. D. Forero-López, N. S. Buzzi, C. V. Spetter, and M. D. Fernández-Severini, "COVID-19 pandemic repercussions on plastic and antiviral polymeric textile causing pollution on beaches and coasts of South America," Science of the Total Environment, vol. 763, Apr. 2021, doi: 10.1016/j.scitotenv.2020.144365.

[24] M. Flury and R. Narayan, "Biodegradable plastic as an integral part of the solution to plastic waste pollution of the environment," Aug. 01, 2021, Elsevier B.V. doi: 10.1016/j.cogsc.2021.100490.

[25] E. S. Okeke et al., "Micro and nanoplastics ravaging our agroecosystem: A review of occurrence, fate, ecological impacts, detection, remediation, and prospects," Feb. 01, 2023, Elsevier Ltd. doi: 10.1016/j.heliyon.2023.e13296.

[26] K. Bucci, M. Tulio, and C. M. Rochman, "What is known and unknown about the effects of plastic pollution: A meta-analysis and systematic review," Ecological Applications, vol. 30, no. 2, Mar. 2020, doi: 10.1002/eap.2044

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