Investigating Indoor Air Quality in Kuwait: A Study of Bokhour Smoke, Traffic Emissions, and Public Perception

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Abstract

Indoor air pollution is a critical public health issue, especially in Kuwait, where cultural practices like burning Bokhour are widespread. This study investigates the gap between actual indoor air quality (IAQ) and public perception. We conducted real-time environmental monitoring of PM2.5, PM10, and HCHO levels, along with a structured survey (N = 300), to evaluate perceptions influenced by demographics, health status, and Bokhour usage. Results revealed that measured pollutant levels often exceeded WHO safety thresholds, yet public perception remained mostly "Neutral." Ordinal Logistic Regression revealed no significant relationship between PM2.5 levels and perceived air quality, underscoring the human inability to detect air pollution accurately. Over 46% of respondents claimed they could detect poor air quality without a device, although the data indicated otherwise. Cultural familiarity with Bokhour did not significantly affect perception, nor did its usage frequency or individual preference. The study concludes that overconfidence bias distort awareness of indoor pollution risks. It emphasizes the need for public education and policy action to address the hidden threats posed by traditional practices and lifestyle factors.

Keywords
Air Pollution, PM2.5 / PM10, Indoor Air Quality (IAQ), Perceived vs. Actual Air Quality, Overconfidence Bias

Biographies
Latifa Boukhathra graduated with a degree in Industrial Engineering from the American University of the Middle East. During her academic journey, she served as the leader of her senior graduation project team, where she demonstrated strong leadership, collaboration, and communication skills. Latifa has completed specialized training in safety and is passionate about continuous learning, planning to pursue further certifications post-graduation. She is proficient in tools like Excel and values teamwork and problem-solving. Her interests lie in optimizing systems and ensuring workplace safety, and she aspires to contribute meaningfully to the field of industrial engineering through both innovation and efficiency.

Sarah Al-Ajmi graduated with a degree in industrial engineering from the American University of the Middle East. Known for her passion for organization, structure, and hard work, she consistently brings dedication and attention to detail into everything she does. Sarah is driven by a strong desire to continuously learn, grow, and acquire new skills that can add real value—both personally and professionally. Her strengths lie in computer proficiency, especially in Excel, as well as in team collaboration and leadership. She thrives in academic and professional environments where group work and strategic thinking are key. Sarah's combination of technical skill, initiative, and a commitment to excellence makes her a dynamic contributor in any setting, with a vision to apply her knowledge in impactful and innovative ways.

Reham Almayyas graduated with a degree in Industrial Engineering from the American University of the Middle

East. She is always looking to improve herself and learn new things that help her grow both personally and professionally. She is passionate about gaining experience and taking on challenges that push her forward. Reham truly enjoys working in a team environment because she believes in the power of collaboration and sharing ideas. Being part of a supportive team motivates her, and she always strives to contribute positively and take initiative in group settings.

Takeaki Toma is an Assistant Professor in Industrial Engineering at the American University of the Middle East, Kuwait. He earned a BS in Information Engineering from the University of the Ryukyus, Japan, Masters in Industrial and Management Engineering from Montana State University, and a Ph.D. in Industrial Engineering from Oregon State University. He has experience in industry and academia in the United States, Japan, and Kuwait. His research interests include Cognitive Engineering, Safety Engineering, Quality Control, Statistical Data Analysis and Machine Learning. He is a member of IEOM and IISE.