

The Role of Digital Air Quality Monitoring and Mobile Health Alerts in Reducing the Public Health Impact of Air Pollution

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PUBLIC HEALTH • DIGITAL PREVENTION

BACKGROUND

Millions of people die prematurely as a result of air pollution every year worldwide, leading to many cases of heart disease and respiratory illness (WHO, 2026).

The current solutions to this problem are clean air legislation and emission control.

The use of digital air quality monitoring through smartphones allows for real-time alerts and personalised



HEALTH PROMOTION VALUES AND PRINCIPLES

The practice of health promotion places importance on the concepts of equity, empowerment, participation, prevention, access and informed choices, which help individuals and communities gain greater control over their health status (Daniel et al. 2025). Digital air quality monitoring enables the implementation of these concepts by giving information about pollutants and sending alerts via mobile phones, allowing individuals to make informed choices and practice protective behaviors. Specific warnings for vulnerable populations such as children, elderly people and those suffering from breathing problems can limit their exposure to pollutants. Nonetheless, the problem of digital exclusion, lack of Internet access and inadequate health literacy skills needs to be considered and overcome.

BEHAVIOURAL CHANGE THEORY

The Health Belief Model (HBM) is used to determine how susceptibility, severity, benefits, barriers, cues to action and self-efficacy affect health-related behaviour.

Real-time air quality monitoring systems help the HBM model by providing pollution alerts to individuals so that they can become aware of their risk exposures and health implications related to it (Subedi et al. 2025).

Notifications on mobile devices serve as cues to action that prompt people to take precautionary measures including decreasing outdoor activities, wearing protective masks and heeding public health advice.

Clear practical recommendations can boost the confidence of people in carrying out preventive actions. However, for behavioural change, resources, accessibility and opportunities also play a vital role.

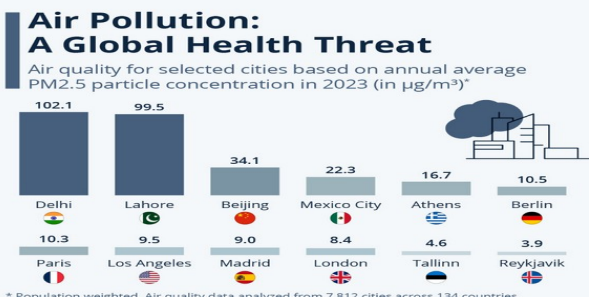


HEALTH BELIEF MODEL IN PRACTICE

Risk awareness → mobile alert as a cue to action → protective behaviour

EXPECTED OUTCOME

Using the Health Belief Model for digital alerts regarding air quality pollution is likely to increase awareness regarding the health risks associated with such pollution and instil protective actions. In addition, real-time alerts are likely to lead to reduced exposure through encouraging people to stay indoors during instances of extreme pollution. This increased health literacy and self-efficacy may help in making good decisions, especially among vulnerable groups (Khanal et al. 2025). It is important to note that results will depend on the precision of alerts and the ability of users to alter their routine activities. Digital alerts can never mitigate pollution exposure or guarantee any health benefits to the population.



CONCLUSION

Implication: Digital monitoring of air quality and mobile alerts regarding health hazards may be a good strategy for addressing health impacts associated with air pollution by means of raising awareness about risks.

The use of the Health Belief Model will contribute to increasing risk perception, self-efficacy, and motivation to protect oneself from potential dangers. However, the efficiency of such an approach depends on the accuracy of alerts and people's responses to them.

Policies, education and research implications: The governments can integrate policies of air pollution regulation with digital health alerts, educate the public, and communicate inclusively. Research can be devoted to studying behavioral impacts.

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