The Impact of Poor Air Quality on Hospitalisations of Multimorbid Patients: A Systematic Review

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Background

Air pollution is ranked as the fourth most severe global health threat (1).

The World Health Organisation reports that 99% of the world population breathes in air which goes above recommended pollution levels, resulting in 7 million yearly global deaths (2).

The five main air pollutants are particulate matter (PM), carbon monoxide (CO), sulphur dioxide (SO_2) nitrogen dioxide (NO_2) and ozone (O_3) (3).
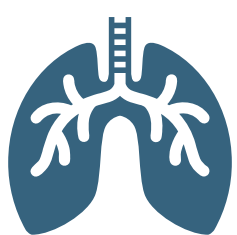
Air pollution can harm multiple body organs simultaneously, but there is little focus on its effects on patients with two or more disease states (4).

Aims

The aim of this systematic review was to assess the effects of five different air pollutants on multimorbid patients (patients with two or more long-term conditions).

Method

Medline, Embase, Web of Science, CINAHL, Global Health, and Scopus were used with a defined search strategy. Papers were obtained and then screened against a set inclusion/exclusion criteria.

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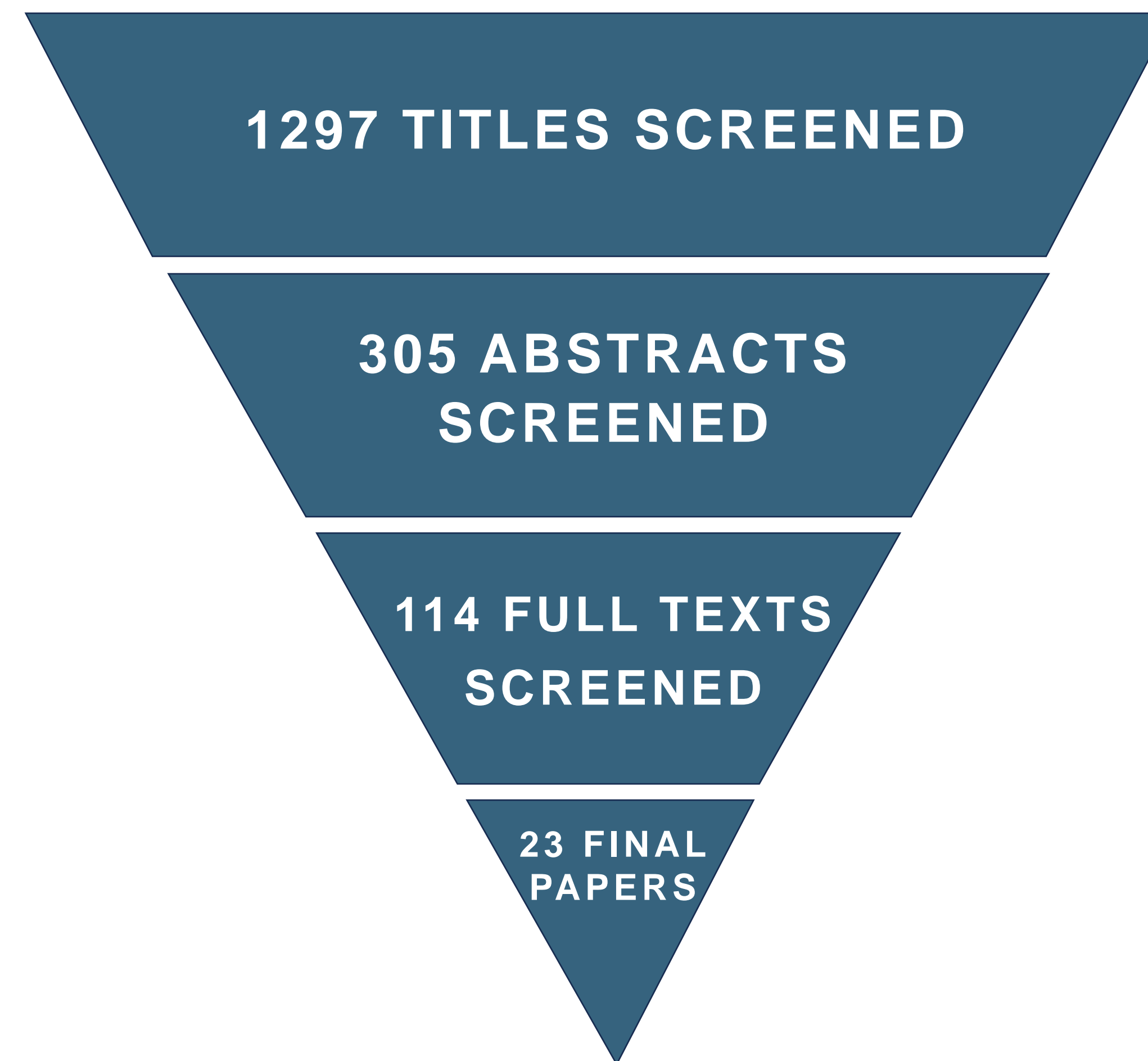
Data was extracted using a pre-designed extraction table. Air pollutant data was then organised to align with five long-term condition clusters from the Lambeth Data Net database (5).

Results

Mental health conditions (e.g. anxiety, depression) had increased hospitalisation rates when there was an increase in PM.

Cardiovascular conditions (e.g. heart failure, atrial fibrillation) were affected by all five air pollutants with increased rates of myocardial infarction and heart failure.

Pain conditions (e.g. osteoarthritis, diabetes) were affected by all five air pollutants. Patients with type 2 diabetes were affected the most.

Liver conditions (e.g. chronic hepatic disease) had no recorded increase in hospitalisations.

Dependence (e.g. alcohol, HIV) were affected by all five air pollutants. NO_2, PM_{10} and CO had the greatest impact.

Conclusion

The review highlights the impact of air pollution and suggests future research should focus on strategies to mitigate exposure for patients in these multimorbidity clusters.

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