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INPLASY

Exploring the associations between Pollinator decline and Human health

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ADMINISTRATIVE INFORMATION

Support - Not applicable.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202580036

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 August 2025 and was last updated on 11 August 2025.

INTRODUCTION

Review question / Objective To identify and summarise the pathways through which pollinator decline affects human health, focusing on nutrient deficiency, malnutrition, food insecurity, and mental health.

Rationale Pollination is an essential regulating, supporting and cultural ecosystem service. Pollinators enhance the productivity of many crops rich in essential micronutrients. The decline in pollinator populations poses a potential risk to human health. This review will explore how the reduction in pollinators might impact human health through multiple pathways, including dietary quality, economic instability, and mental stress.
A preliminary search was conducted in PubMed, Web of Science, and Scopus using combinations of keywords such as pollinator decline, human health, malnutrition, mental health, micronutrients, and food security. The studies retrieved varied in methodology and focus, highlighting the need for a comprehensive synthesis of the existing literature to guide future research.

Condition being studied Impact on human health through multiple pathways, including nutrient deficiency, malnutrition, food insecurity, and mental health.

METHODS

Search strategy A systematic search will be conducted in the following electronic databases:
• PubMed
• Web of Science
• Scopus
Search terms will include controlled vocabulary (e.g., MeSH) and free-text keywords such as: Pollinator decline, bee population, insect pollination and Human health, nutritional deficiency, food insecurity, malnutrition.
Boolean operators (AND, OR) will be used to combine terms. A full search strategy will be into the final review.

Participant or population Human populations affected directly or indirectly by the decline of pollinators. No restrictions on age, gender, ethnicity, or geography.

Intervention Decline or reduction in pollinator populations (including both managed and wild pollinators).

Comparator Not applicable.

Study designs to be included All original qualitative and quantitative studies, including cohort and cross-sectional studies, will be considered.

Eligibility criteria Inclusion Criteria:
• Studies that examine any pathway linking pollinator decline to human health outcomes.
• Published in English.
• Published from the year 2000 onwards.
• Studies with human health associations will be considered as relevant to the review.
Exclusion Criteria:
•Published in a language other than English.
•Published before the year 2000.
•Commentaries, editorials, or letters to the editor.
•Studies focusing solely on ecological impacts without linking to human health.

Information sources A systematic search will be conducted in the following electronic databases:
• PubMed
• Web of Science
• Scopus.

Main outcome(s) Pollinator decline impacts human health by worsening nutritional status (e.g., micronutrient deficiencies, malnutrition), increasing food insecurity, and contributing to mental health issues like anxiety and depression.

Data management All results will be imported using EndNote citation software. Data collection will be done through Covidence, where data from included studies will be extracted independently by two reviewers using a standardized data extraction table. Any conflicts will be resolved with a third reviewer. Extracted data will include study characteristics, interventions, outcomes, and key findings relevant to the research question.

Quality assessment / Risk of bias analysis The methodological quality and risk of bias of included studies will be assessed using the Mixed Methods Appraisal Tool (MMAT) and the Risk of Bias In Non-randomized Studies of Interventions (ROBINS-I).

Strategy of data synthesis A conceptual framework will be developed to visualize the pathways between pollinator decline and health outcomes.

Subgroup analysis If data allows, subgroup analysis may be conducted based on:
Geographic region
Type of pollinator
Type of pathway.

Sensitivity analysis Not applicable.

Language restriction Only English-language articles will be included in the search strategy.

Country(ies) involved Australia - School of Public Policy, Indian Institute of Technology Delhi, New Delhi, India and School of Public Health, The University of Queensland, Brisbane, Queensland.

Keywords Pollinator decline, human health, food insecurity, nutritional deficiency, malnutrition, mental health, economic consequence.

Dissemination plans Findings will be submitted to a peer-reviewed journal in the fields of environmental health or public health. The results will also be presented at relevant academic and policy conferences.

Contributions of each author
Author 1 - Pragati Yadav - Methodology, validation, formal analysis, investigation, data curation, writing – original draft, writing – review & editing, visualisation.
Email: p.yadav@uq.edu.au
Author 2 - Manchi Jandial -Initial screening with the title and abstract scan and data extraction.
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