

BMJ Open Factors influencing health-promoting lifestyle among medical personnel: a systematic review protocol

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ABSTRACT

Introduction A health-promoting lifestyle is essential for improving quality of life and reducing the risk of chronic diseases. However, despite their high health literacy, medical personnel often show low adherence to such lifestyles. Identifying the factors influencing these behaviours in medical professionals is critical for developing effective interventions. This review aims to identify the factors that influence the health-promoting lifestyle among medical personnel.

Methods and analysis We will conduct a systematic search across three electronic databases: Web of Science, Scopus and PubMed. To ensure comprehensive literature coverage, we will also examine the reference lists of included studies and relevant reviews identified during the search. Eligible studies will include quantitative, qualitative and mixed-methods research articles that investigate factors influencing health-promoting lifestyles among medical personnel. No restrictions will be applied regarding geographical location or publication year. Only original, peer-reviewed journal articles published in English will be considered. The search strategy will incorporate key terms and their synonyms, including Medical Subject Headings terms such as ‘factor’, ‘barrier’, ‘enabler’, ‘health-promoting lifestyle’, ‘medical personnel’, ‘doctor’, ‘nurse’, ‘medical technician’, ‘pharmacist’ and ‘hospital administrative staff.’ All retrieved studies will be imported into Rayyan software for duplicate removal. Two independent reviewers will conduct the screening process based on predefined inclusion and exclusion criteria. The risk of bias in individual studies will be assessed using the Mixed Methods Appraisal Tool. A narrative synthesis approach will be employed to synthesise findings, categorising identified influencing factors into five levels of the Ecological Model of Health Behavior: intrapersonal, interpersonal, organisational, community and public policy levels.

Ethics and dissemination Ethical approval is not required as no original data collection is involved. Findings will be disseminated via peer-reviewed journals, conferences and the primary author’s PhD thesis.

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INTRODUCTION

Rationale

The notion of lifestyle encompasses a broad spectrum, encompassing material life,

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Uses a mixed-methods approach for a comprehensive evaluation of factors influencing health-promoting lifestyles among medical personnel.
- ⇒ Applies the Ecological Model of Health Behavior, offering a structured analysis across individual, organisational and policy levels.
- ⇒ It uses a robust systematic review methodology to identify trends and gaps in the existing literature, ensuring the findings are evidence-based and comprehensive.
- ⇒ The study is limited to literature published in English, potentially excluding valuable insights from studies conducted in non-English speaking regions.

spiritual well-being and various other related aspects.¹ Lifestyle refers to the routine and conventional activities that people engage in throughout their lives, which can significantly impact their health. It is a specific and definable pattern of behaviour shaped by the interaction between personal characteristics, social relationships, environmental conditions and socioeconomic status.^{2,3} Health is fundamentally linked to a health-promoting lifestyle, as adopting such a lifestyle is the key to effective health promotion.⁴ Zeng *et al* define a health-promoting lifestyle as individuals’ behaviours and beliefs encompassing various aspects of health enhancement, aiming to elevate or maintain well-being while minimising the risk of illness.⁵ A lifestyle that fosters health can be specifically divided into six components: consistent physical exercise, maintaining a nutritious and balanced diet, assuming health responsibilities, effective stress management, cultivating spiritual growth and nurturing positive relationships.⁶

Many factors affect human health, including genetics, environment and lifestyle-related behaviours.⁷ According to the WHO, lifestyle and behaviour account for 60% of the factors that influence health, highlighting that effective management of health-risk

behaviours can prevent numerous diseases.^{8–10} Incorporating health-promoting behaviours into a healthy lifestyle leads to improved health, enhanced functional abilities and a better quality of life throughout all stages of development.¹¹ A health-promoting lifestyle is an active lifestyle that leads individuals to achieve their maximum potential for well-being, self-actualisation and personal fulfilment.^{12–13} Embracing health-promoting behaviours is essential for achieving good health, as it reduces morbidity and mortality while enhancing the quality of life, life satisfaction and well-being. Moreover, adopting a health-promoting lifestyle can help alleviate the burden on healthcare systems.^{2,6–14}

Healthcare workers showed a high prevalence of risk factors associated with lifestyle diseases.¹⁵ In the USA, Dayoub and Jena mentioned that despite medical personnel potentially adopting healthier lifestyle choices and experiencing better health outcomes attributed to elevated health literacy, there is limited understanding regarding the specific health outcomes of healthcare professionals in comparison to the general population.¹⁶ Previous research suggests that in Latin America and the USA, health professionals are not sufficiently adhering to health-promoting guidelines.^{17–19} In Brazil, a study conducted by Hidalgo *et al* showed that a significant percentage of medical staff reported not adopting healthy lifestyles that have an impact on chronic diseases.²⁰ In Malaysia, Tong *et al* studied a group of nurses at a teaching hospital and reported that nearly half of the nurses in the study sample were found not to be physically active and were overweight or obese.²¹ According to US-based research stemming from the Nurses' Health Study, it has been uncovered that 3% or less of nurses adopt healthy lifestyles, encompassing a nutritious diet, regular physical activity, maintaining an optimal weight and abstaining from smoking.²² Given the importance of health-promoting lifestyles and the current lifestyle status of medical personnel, it is particularly crucial to identify the factors influencing their adoption of such lifestyles to develop precise and effective interventions to improve their health outcomes.

According to our literature review, there are limited studies that systematically review what factors influence the health-promoting lifestyle of medical personnel. In reviewing the factors that influence health-promoting lifestyles, most studies focus on non-healthcare populations, such as high school students,²³ university students,²⁴ adolescents,²⁵ adolescents with obesity,²⁶ employees,²⁷ minority ethnic populations,²⁸ Iranian women,²⁹ post-partum women,³⁰ people with infertility,³¹ patients with gynaecological cancer³² and patients with chronic non-communicable diseases.³³ A smaller number of articles address healthcare professionals, primarily focusing on nurses.^{22–34–36} Among these, two reviews are limited to specific regions, such as nurses in South Korea³⁴ or hospital nurses in the USA.²² Additionally, other studies on healthcare professionals only review factors related to specific health-promoting behaviours, such as smoking

cessation,^{37–38} physical activity^{39–40} or healthy eating,^{41–43} lacking comprehensiveness. Through the above review of literature reviews, it is particularly necessary to comprehensively and systematically synthesise the research evidence of factors affecting the health-promoting lifestyle of medical personnel, including doctors, nurses, pharmacists, medical technicians and hospital administrators, and it is of great significance to fill the gaps mentioned above.

Objective

The specific objective of this review is to identify the factors that influence the health-promoting lifestyle of medical personnel.

Theoretical basis

The Ecological Model of Health Behavior (EMHB) is a comprehensive framework aimed at understanding and influencing health behaviours by considering multiple levels of influence on an individual's actions.⁴⁴ Widely recognised as an effective approach, EMHB helps identify the various factors impacting health behaviours at different levels and establishes connections among individual, social and environmental determinants.^{45–46} Specifically, this model divides influences on health behaviour into five levels: (1) intrapersonal levels, like age and education; (2) interpersonal levels, including family and social support; (3) organisational levels, including workplaces, schools and healthcare facilities; (4) community levels, such as occupation and income; (5) policy environments at local, national and global levels,^{45–47} (see figure 1).⁴⁸

The EMHB provides a valuable framework for understanding health behaviours by examining influences across multiple levels, including individual, social, organisational, community and policy factors.^{44–45–49} This theoretical framework allows for a comprehensive and hierarchical presentation of the factors identified in the study that influence health-promoting lifestyles among



Figure 1 Frame diagram of the Ecological Model of Health Behavior. Note: source from Sagi *et al*.⁴⁸

medical personnel. This multilevel approach enables public health professionals to design effective interventions that foster sustainable behaviour changes and improve health outcomes by addressing interconnected influences.⁴⁷

METHODS AND ANALYSIS

This systematic review protocol is reported in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) Protocols guidelines.^{50 51} The protocol for this systematic review was registered in the International Prospective Register of Systematic Review (PROSPERO) with registration number CRD42024579746. The study is planned to start on 3 September 2024 and end on 3 September 2025. Any modifications to this protocol during the study will be reported to PROSPERO and documented in the final manuscript before publication, ensuring that all amendments are transparently presented in the systematic review.

Eligibility criteria

Systematic mixed studies reviews, which integrate both qualitative and quantitative evidence, are becoming increasingly popular due to their ability to offer deeper insights into complex phenomena and interventions.^{52 53} The inclusion of qualitative, quantitative and mixed-methods evidence is grounded in the principle of methodological pluralism, which recognises that different research designs offer unique and complementary insights.⁵² This integrative approach aligns with the objective of this review—to comprehensively and systematically identify the factors that influence health-promoting lifestyles among medical personnel. Therefore, any studies focusing on these factors, including quantitative, qualitative and mixed-methods research articles, will be included. However, studies must provide data that can be directly extracted to address the factors required for this review; otherwise, they will be excluded. Due to variations in the classification standards of medical personnel across different countries, for the purpose of operational feasibility, this study specifically defines medical personnel as doctors, nurses, pharmacists, medical technicians and administrative personnel of medical institutions. The exclusion of other groups constitutes a limitation of this study. The outcome of this review is the health-promoting lifestyle, which is typically measured using validated scales such as the Health-Promoting Lifestyle Profile II or similar instruments. There are no restrictions on geographic location or years of publication. To ensure consistency in language interpretation and to align with the language proficiency of the research team, only publications in English will be included.

Inclusion criteria

- ▶ Original and peer-reviewed journal articles.
- ▶ A journal article written in English.

- ▶ The full-text article needs to be accessible.
- ▶ Studies exploring factors influencing health-promoting lifestyles among medical personnel, including those employing quantitative, qualitative and mixed-methods, will be included. To be included, studies must provide directly extractable data on the factors required for this review.
- ▶ The study participants are medical personnel, specifically referring to doctors, nurses, pharmacists, medical technicians and administrative personnel of medical institutions.
- ▶ Studies examine the health-promoting lifestyle as an outcome.

Exclusion criteria

- ▶ Review articles, opinion articles, magazine articles, abstracts, editorials, commentaries, dissertations, theses, letters, conference proceedings and books.
- ▶ A journal article written in a language other than English.
- ▶ Studies that remain inaccessible despite efforts to contact the authors.
- ▶ Studies from which factors influencing health-promoting lifestyles among medical personnel can only be indirectly inferred—such as intervention studies focusing on evaluating the effects of specific interventions rather than exploring influencing factors—will be excluded.
- ▶ The study participants are staff engaged in health activities outside of medical institutions, such as personnel of the government administrative authority overseeing medical institutions and staff of public welfare organisations related to health.
- ▶ Studies that examine outcomes rather than the health-promoting lifestyle as a whole, instead focusing on its elemental variables, such as smoking cessation, physical activity, dietary habits and stress management.

Information sources

We will search three electronic databases: two multidisciplinary (Web of Science and Scopus) and one health-related database (PubMed). This selection is based on their complementary strengths: Web of Science and Scopus provide extensive disciplinary coverage and high-quality articles, while PubMed is specifically tailored to the biomedical field and ensures the inclusion of rigorously peer-reviewed studies. Together, these databases guarantee the comprehensiveness and academic rigour of the included research. To further ensure comprehensive coverage of the literature, we will also scan the reference lists of included studies and relevant reviews identified during the search.⁵¹

Search strategy

We will search three databases (Web of Science, Scopus and PubMed) using the following key terms along with their synonyms and Medical Subject Headings terms: factor, barrier, enabler, health-promoting lifestyle,

Table 1 Search strategies for Web of Science, Scopus and PubMed

Database	Query	Limiters	Field
Web of Science	(factor* OR determinant* OR effect* OR	(DT==(“ARTICLE”) AND LA==(“ENGLISH”))	TOPIC
Scopus	influenc* OR affect* OR impact* OR predictor* OR barrier* OR obstacle* OR enabler* OR facilitator*) AND (“health- promoting lifestyle*” OR “health promoti lifestyle*” OR “health* lifestyle*” OR “health* living” OR “health-promoting behavio*” OR “health promoti* behavio*”) AND (“medical personnel” OR “medical staff” OR “medical provider*” OR “medical worker*” OR “medical practitioner*” OR “medical and health personnel” OR “health professional*” OR “health personnel” OR “healthcare provider*” OR “health care provider*” OR “healthcare professional*” OR “health care professional*” OR “healthcare worker*” OR “health care worker*” OR “health care personnel” OR “health- care staff” OR “hospital staff*” OR “hospital worker*” OR physician* OR doctor* OR clinician* OR nurse* OR “medical technician*” OR pharmacist* OR “hospital administrative staff*” OR “hospital administrative personnel”)	(LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (LANGUAGE, “English”))	TITLE-ABS-KEY
PubMed		(NOT “review”(Publication Type) NOT “systematic review”(Publication Type) NOT “editorial”(Publication Type) NOT “comment”(Publication Type) NOT “letter”(Publication Type) NOT “clinical conference”(Publication Type) NOT “english abstract”(Publication Type)) AND (english(Filter))	Title/abstract

medical personnel, doctor, nurse, medical technician, pharmacist and hospital administrative staff. The search of the Web of Science database will be conducted in the ‘TOPIC’ field; Scopus in the ‘TITLE-ABS-KEY’ field; PubMed in the ‘Title/Abstract’ field. The search will have no restrictions on the start date, and the end date will be the date on which the search is conducted. The search will also be limited to English-language peer-reviewed journal articles. The settings of the filters during the search will vary slightly depending on the characteristics of the respective databases. The detailed search strategies for the three databases are provided in [table 1](#).

Study records

The results retrieved from the three databases will be imported into the software Rayyan⁵⁴ and duplicate records will be removed. Studies will be screened independently by two authors according to inclusion and exclusion criteria. In instances of disagreement, the texts will be thoroughly reviewed in meetings until a consensus is reached, after which the literature will be chosen. Referring to the PRISMA specification,^{55 56} a PRISMA flow diagram is created once the selection process is complete, as shown in [figure 2](#).⁵⁷

Similar to the screening process, data extraction is performed by two independent reviewers working in parallel to minimise bias and reduce errors during data extraction. The extracted data will include demographic details, methodology and all reported factors affecting the health-promoting lifestyle of medical personnel. These data will be organised in both narrative and tabular

formats to facilitate comprehensive reporting. To facilitate systematic summarisation and interpretation of study characteristics and findings, data extraction will be structured using a spreadsheet.⁵⁸ Any disagreements between reviewers will be resolved through discussion until a consensus is reached. If important information is missing from the text or uncertainties arise, we will contact the study authors by email to resolve the issues. Additionally, we will offer training to research members of the review team who are unfamiliar with the Rayyan software and the content area before the review begins.⁵¹

Risk of bias in individual studies

The Mixed Methods Appraisal Tool (MMAT) V.2018⁵⁹ will be applied to assess the risk of bias for each included study. The tool is a critical appraisal tool intended for the evaluation phase of systematic mixed studies reviews, which encompass qualitative, quantitative and mixed-methods studies.^{59 60} The latest version of the MMAT (V.2018) comprises two screening questions and 25 criteria of five different categories.⁶⁰ The screening questions applicable to all study types are, ‘Are there clear research questions?’ and ‘Do the collected data address the research questions?’ The MMAT assesses five categories of study designs commonly found in mixed-method systematic reviews: (1) qualitative, (2) randomised controlled, (3) non-randomised, (4) quantitative descriptive and (5) mixed-methods.^{59–61}

For rating each item, there are three response options: ‘Yes’, indicating that the criterion is met; ‘No’, indicating that the criterion is not met; ‘Can't tell’, used when there is

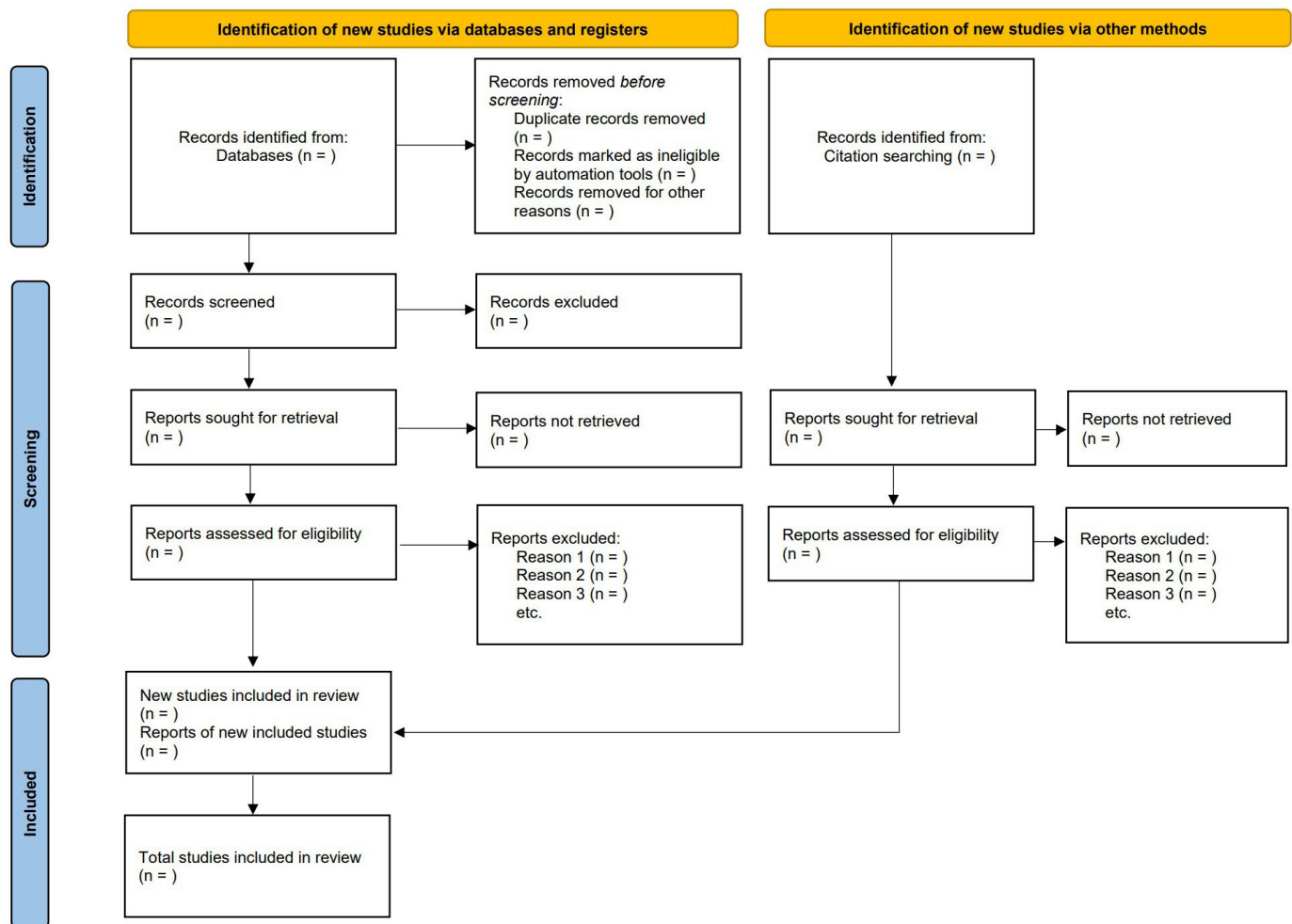


Figure 2 Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram of the study selection process.

insufficient information in the paper to determine whether the criterion is met.^{59–61} According to the MMAT user guide,⁵⁹ ratings are conducted independently by two reviewers. In cases of disagreement between the reviewers, a third reviewer will be consulted to resolve the discrepancies.

Data synthesis

A narrative synthesis will be conducted to explore the factors influencing health-promoting lifestyles among medical personnel. This approach is frequently used to integrate findings from multiple studies, particularly when the heterogeneity in study design or outcomes makes statistical meta-analysis unfeasible.^{62 63} Because narrative synthesis allows for the integration of both quantitative and qualitative research, it is especially valuable in systematic reviews where experimental and quasiexperimental studies lack the necessary comparability for a meta-analytical approach.^{64 65} Through the application of narrative synthesis, researchers can organise and interpret diverse findings within thematic or conceptual frameworks, offering comprehensive insights across studies while ensuring transparency throughout the synthesis process.^{63 65} To ensure the robustness of the findings, triangulation will be employed by comparing and contrasting the results from quantitative and qualitative studies.

A narrative synthesis of the findings will be generated around various factors that influence health-promoting lifestyles among medical personnel, such as work environment,⁶⁶ stress⁶⁶ and lack of social support.⁶⁷ The influencing factors extracted from all the included studies will be correspondingly classified into the five levels of the EMHB, namely, the intrapersonal level, the interpersonal level, the organisational level, the community level and the public policy level.⁴⁵ This structured approach provides a comprehensive framework to understand the interplay of various factors at each level, highlighting how health-promoting behaviours among medical personnel are shaped by both individual and broader social determinants.^{44 46}

Patient and public involvement

Patients and/or the public were not involved in this study.

ETHICS AND DISSEMINATION

Ethical approval is not required for this systematic review, as it does not involve the collection of original data and relies exclusively on publicly available materials. The outcomes of this review will be disseminated through

peer-reviewed publications and conference presentations and will contribute to the PhD thesis of the primary author.

Contributors PH and KBA contributed to the conception and design of the study. PH and HX drafted the initial manuscript, while KBA, DSBA and QZ critically revised it for important intellectual content. ZX helped screen full texts and refine inclusion criteria. All authors reviewed and approved the final protocol. PH is the guarantor for this review.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

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