

Determinants of Health Behavior in Public Health Promotion: A Critical ReviewNur Ekawati¹, Pusfitasari¹, Andi Asrina², Yusriani², Fairus Prihatin Idris²¹Doctoral Program in Public Health, Universitas Muslim Indonesia, Makassar, Indonesia²Department of Public Health, Universitas Muslim Indonesia, Makassar, Indonesia**ABSTRACT**

Health behavior is a major determinant of individual and population health and is shaped by multiple interacting factors across different levels of influence. This study aimed to critically analyze the determinants of health behavior and their implications for public health promotion. A critical review was conducted using a transparent study selection process guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020). Electronic searches were performed in PubMed, Scopus, ScienceDirect, and Google Scholar, resulting in 39 studies published between 2021 and 2026 that met the predefined eligibility criteria. Methodological quality was critically appraised using design-specific assessment tools, and the evidence was examined through analytical and interpretive synthesis. Six major categories of health behavior determinants were identified: individual, social, environmental, cultural and religious, technological, and policy determinants. Individual determinants, particularly health literacy, self-efficacy, knowledge, motivation, and health beliefs, were the most frequently examined. However, the synthesis demonstrated that these determinants did not operate independently but interacted with social relationships, environmental opportunities, cultural contexts, technological conditions, and policy environments. The review identified several theoretical, methodological, and empirical gaps, including the predominance of individual-level perspectives and limited attention to interactions among contextual and structural determinants. These findings highlight the need for multilevel, context-sensitive, and theoretically integrated health promotion strategies that simultaneously address individual capabilities and the broader social, environmental, cultural and religious, technological, and policy conditions shaping health behavior.

Keywords: health behavior, health promotion, health literacy, multilevel determinants, public health

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INTRODUCTION

Health behavior plays a central role in public health promotion because many preventable diseases, premature deaths, and health inequalities are closely associated with individual and collective behavioral patterns. Behaviors related to physical activity, dietary practices, tobacco and alcohol use, preventive health measures, self-care, health information seeking, and utilization

of health services contribute substantially to population health outcomes (Akter *et al.*, 2023; Holt-Lunstad, 2024; Hu *et al.*, 2021). Consequently, understanding the factors that shape health behavior remains essential for designing effective health promotion interventions and improving population health.

Health behavior, however, is not determined solely by individual knowledge or personal choice. Contemporary public health perspectives increasingly recognize that behavior is shaped by complex interactions among individual, interpersonal, social, environmental, cultural, technological, and structural conditions (Hu *et al.*, 2021; Mudd *et al.*, 2024; Willmott *et al.*, 2021). Health literacy, self-efficacy, perceived risks and benefits, and motivation may influence an individual's capacity and willingness to adopt healthy behaviors (Darvishpour *et al.*, 2022; Dzerounian *et al.*, 2022; Gao *et al.*, 2024). At the same time, social support, family relationships, community networks, socioeconomic conditions, and access to resources may facilitate or constrain behavioral choices (Babygeetha & Devineni, 2024; Guo *et al.*, 2025; Peng *et al.*, 2024). These influences indicate that health behavior should be understood as a multidimensional phenomenon embedded within broader social and environmental contexts.

Environmental conditions also play an important role in shaping opportunities for healthy behavior. The availability and accessibility of health services, neighborhood characteristics, physical infrastructure, exposure to health risks, and broader socioeconomic inequalities may influence the ability of individuals and communities to adopt and maintain healthy practices (Andalib *et al.*, 2024; Frehlich *et al.*, 2022; Song *et al.*, 2024). Therefore, interventions that focus exclusively on individual behavior change without considering environmental and structural conditions may have limited effectiveness, particularly among populations experiencing social and economic disadvantages (Berete *et al.*, 2024; Ma *et al.*, 2021; Mudd *et al.*, 2024).

Cultural and religious contexts further contribute to the complexity of health behavior. Cultural values, beliefs, traditions, social norms, and religious practices may influence perceptions of health and illness, acceptance of preventive measures, health service utilization, and adherence to recommended behaviors (Asrina *et al.*, 2023; Itis *et al.*, 2025; Nurmansyah *et al.*, 2022; Rachmawati *et al.*, 2022). These factors may function as either facilitators or barriers to health promotion depending on the population and context. Understanding culturally and religiously embedded influences is therefore important for developing health promotion strategies that are socially acceptable, context-sensitive, and responsive to community needs (Cipta *et al.*, 2024).

Rapid technological development has introduced another important dimension of health behavior. Digital health platforms, social media, mobile applications, telehealth services, and online health information have expanded opportunities for health communication, education, self-management, and behavioral intervention (Chidambaram *et al.*, 2024; Ferretti *et al.*, 2023; Kite *et al.*, 2023). However, technological development may also generate new challenges related to digital literacy, unequal access to technology, misinformation, privacy, and digital health inequalities (Ji *et al.*, 2024; Kickbusch *et al.*, 2021; Lyles *et al.*, 2023). The influence of technology on health behavior must therefore be interpreted in relation to the social, economic, and structural conditions that determine individuals' ability to access and effectively use digital resources.

At the broader structural level, public policies and governance systems influence health behavior by shaping social environments, access to resources, health services, and opportunities for healthy choices (Akter *et al.*, 2023; Kelly *et al.*, 2025; Li, 2025). Regulatory policies, public health programs, intersectoral collaboration, and evidence-based governance may facilitate population-level behavior change (Tancred *et al.*, 2024). Conversely, inadequate policies, unequal implementation, and structural barriers may reinforce unhealthy behaviors and health inequalities. These conditions demonstrate that effective public health promotion requires interventions that operate not only at the individual level but also across social, environmental, technological, and policy systems (Cini *et al.*, 2023; Lee *et al.*, 2025).

Recent studies have examined various determinants of health behavior, including health literacy, self-efficacy, social support, built environments, cultural and religious influences, digital technologies, and public policies (Darvishpour *et al.*, 2022; Gao *et al.*, 2024; Guo *et al.*, 2025; Ji *et al.*, 2024). The available evidence demonstrates increasing recognition of the multidimensional nature of health behavior. Nevertheless, the literature remains fragmented across specific determinants, populations, health conditions, behavioral outcomes, and theoretical perspectives (Mudd *et al.*, 2024). Many studies focus primarily on individual-level factors, while others separately examine social, environmental, cultural, technological, or policy influences. Consequently, the relationships and interactions among determinants operating across different levels remain insufficiently integrated.

Existing reviews have also tended to focus on particular behavioral determinants, intervention approaches, population groups, health conditions, or theoretical frameworks (Babygeetha & Devineni, 2024; Ferretti *et al.*, 2023; Frehlich *et al.*, 2022; Islam *et al.*, 2023; Kim *et al.*, 2022). Although these reviews provide important insights into specific dimensions of health behavior, limited attention has been given to critically comparing recent evidence across multiple determinant domains and diverse public health contexts. It remains unclear which determinants dominate the current literature, where findings converge, diverge, or contradict one another, how determinants operating at different levels interact, and which theoretical, methodological, and empirical gaps remain insufficiently addressed. This fragmentation represents an important research gap because health behavior rarely results from a single determinant operating independently.

Addressing this gap requires an analytical perspective that moves beyond the descriptive identification and classification of determinants. Individual capabilities, knowledge, perceptions, and motivations are embedded within interpersonal relationships, social networks, physical and community environments, cultural and religious contexts, rapidly evolving digital ecosystems, and broader policy and structural conditions (Hu *et al.*, 2021; Lyles *et al.*, 2023; Mudd *et al.*, 2024; Willmott *et al.*, 2021). Critical integration of these dimensions is needed to understand not only which determinants influence health behavior but also how their relative importance, interactions, and contextual relevance vary across populations and public health settings.

The novelty of the present review lies in its critical and integrative synthesis of recent evidence on health behavior determinants across multiple levels of influence. Unlike reviews that primarily examine a specific determinant, population, behavioral outcome, or theoretical framework, this review compares evidence across diverse study designs and public health contexts to identify convergent, divergent, and contradictory findings; examine dominant and underexplored determinants; explore interactions among multiple levels of influence; and identify theoretical, methodological, and empirical gaps. The findings are further interpreted through complementary behavioral and ecological perspectives, including the Social Ecological Model, Health Belief Model, Social Cognitive Theory, COM-B framework, and PRECEDE-PROCEED model.

Accordingly, this critical review aims to synthesize and critically interpret recent scientific evidence on the multidimensional determinants of health behavior in the context of public health promotion. Specifically, the review seeks to identify determinants reported in recent literature, examine how these determinants operate and interact across multiple levels of influence, critically compare patterns and inconsistencies across populations and contexts, identify dominant and underexplored determinants and research gaps, and develop an integrative conceptual understanding that may inform more comprehensive, context-sensitive, and multilevel health promotion strategies.

METHODS

Study Design

This study employed a critical review approach to synthesize and critically interpret recent evidence on the determinants of health behavior in public health promotion. The review aimed to move beyond descriptive summarization by comparing evidence across populations, contexts, and study designs; identifying convergent, divergent, and contradictory findings; examining dominant and underexplored determinants and their multilevel interactions; and identifying theoretical, methodological, and empirical gaps.

The PRISMA 2020 framework was used to enhance transparency in the identification, screening, eligibility assessment, and selection of studies rather than as the methodological basis for classifying this study as a systematic review. The critical component was conducted through analytical and interpretive synthesis, with findings interpreted using the Social Ecological Model, Health Belief Model, Social Cognitive Theory, COM-B framework, and PRECEDE-PROCEED model as complementary theoretical lenses.

Research Question

This critical review sought to answer the following research question: “What determinants of health behavior have been identified in recent public health literature, how do these determinants operate and interact across multiple levels of influence, and what dominant patterns and research gaps can be identified to inform contemporary health promotion strategies?”

Search Strategy

Electronic searches were conducted using PubMed, Scopus, ScienceDirect, and Google Scholar to identify relevant English-language publications from 2021 to 2026. The search strategy combined terms related to health behavior, behavioral determinants, and public health promotion, including “health behavior,” “health behaviour,” “behavior change,” “behaviour change,” “determinants,” “health promotion,” “public health,” “health literacy,” “self-efficacy,” “social support,” “social determinants,” “environment,” “built environment,” “culture,” “religion,” “digital health,” “technology,” and “health policy.” Boolean operators (“AND” and “OR”) were used, and search syntax and filters were adapted to each database.

Eligible publications included original quantitative, qualitative, and mixed-method studies; systematic reviews and meta-analyses; scoping reviews; and relevant evidence-based narrative, conceptual, and evidence-synthesis articles. Database-specific search strategies and filters are presented in Table 1.

Table 1. Database-Specific Search Strategies and Filters

Database	Search Strategy	Filters Applied
PubMed	(“health behavior” OR “health behaviour” OR “behavior change” OR “behaviour change”) AND (“determinants” OR “health literacy” OR “self-efficacy” OR “social support” OR “social determinants” OR “environment” OR “built environment” OR “culture” OR “religion” OR “digital health” OR “technology” OR “health policy”) AND (“health promotion” OR “public health”)	2021-2026; English

Database	Search Strategy	Filters Applied
Scopus	TITLE-ABS-KEY ("health behavior" OR "health behaviour" OR "behavior change" OR "behaviour change") AND TITLE-ABS-KEY ("determinants" OR "health literacy" OR "self-efficacy" OR "social support" OR "social determinants" OR "environment" OR "built environment" OR "culture" OR "religion" OR "digital health" OR "technology" OR "health policy") AND TITLE-ABS-KEY ("health promotion" OR "public health")	2021-2026; English; Article and Review
ScienceDirect	("health behavior" OR "health behaviour" OR "behavior change" OR "behaviour change") AND ("determinants" OR "health literacy" OR "self-efficacy" OR "social support" OR "social determinants" OR "environment" OR "built environment" OR "culture" OR "religion" OR "digital health" OR "technology" OR "health policy") AND ("health promotion" OR "public health")	2021-2026; Research and Review Articles
Google Scholar	("health behavior" OR "behavior change") AND ("determinants" OR "health literacy" OR "self-efficacy" OR "social support" OR "environment" OR "culture" OR "religion" OR "digital health" OR "technology" OR "health policy") AND ("health promotion" OR "public health")	2021-2026; screened according to eligibility criteria

Inclusion and Exclusion Criteria

Studies were eligible if they were published in English between 2021 and 2026; examined determinants influencing health behavior within public health or health promotion contexts; investigated individual, interpersonal, social, community, environmental, cultural, religious, technological, policy, or structural influences; reported relevant behavioral outcomes; and employed eligible original or review-based study designs across different populations and settings.

Studies were excluded if they were published outside the predefined period or in languages other than English; did not examine determinants of health behavior; focused exclusively on clinical, biomedical, diagnostic, or therapeutic outcomes without a behavioral component; were editorials, commentaries, letters, conference abstracts, theses, dissertations, preprints, or other non-peer-reviewed publications; provided insufficient methodological, conceptual, or analytical information for critical synthesis; or were duplicate records or publications.

Study Selection and Data Extraction

Study selection was documented according to PRISMA 2020 and included identification, screening, eligibility assessment, and inclusion. Duplicates were removed before title and abstract screening, followed by full-text assessment according to the predefined eligibility criteria. Reasons for full-text exclusion were documented, and the selection process was reported using the PRISMA 2020 flow diagram.

Data were systematically extracted using a structured framework comprising author and year, country or setting, study design, population or evidence base, health behavior examined, determinants identified, key findings, and methodological considerations. The extracted data supported comparison across studies and subsequent critical appraisal and synthesis.

Quality and Critical Appraisal

The methodological quality of the included studies was critically appraised using design-appropriate assessment tools. JBI Critical Appraisal Checklists were used for systematic reviews and research syntheses, analytical cross-sectional studies, and qualitative studies; SANRA was used for narrative and conceptual reviews; and AACODS was used for relevant commission reports and evidence syntheses.

The appraisal examined methodological rigor, transparency, appropriateness of study design and analysis, potential bias and confounding, and consistency between findings and conclusions. Studies were not excluded solely on the basis of appraisal findings. Instead, methodological quality was used to inform the interpretive weight assigned to individual studies during the critical synthesis.

Evidence from methodologically stronger studies was given greater consideration when evaluating the consistency and relevance of findings, whereas studies with methodological limitations were interpreted more cautiously and primarily used to provide contextual, conceptual, theoretical, or complementary perspectives. This approach enabled methodological quality to be incorporated into the analytical and interpretive synthesis while accommodating the diversity of study designs and evidence types included in the review.

Data Analysis

The included studies were analyzed through iterative analytical and interpretive synthesis. Study characteristics, methodological quality, and key findings were examined, and identified determinants were coded according to their conceptual meaning, context, level of influence, and relationship with health behavior.

Codes were compared across studies and grouped through iterative thematic categorization, resulting in six overarching categories: individual, social, environmental, cultural and religious, technological, and policy determinants. These categories were derived from recurring patterns in the evidence rather than imposed exclusively as predetermined classifications.

Findings were critically compared across populations, contexts, and study designs to identify convergence, divergence, contradiction, dominant and underexplored determinants, multilevel interactions, and theoretical, methodological, and empirical gaps. The synthesized findings were subsequently interpreted using the Social Ecological Model, Health Belief Model, Social Cognitive Theory, COM-B framework, and PRECEDE-PROCEED model, while methodological quality informed the interpretive weight assigned to the evidence.

This analytical and interpretive process provided the basis for a critical synthesis of multidimensional health behavior determinants and the development of an integrative multilevel conceptual framework.

RESULTS

Study Selection

The study selection process followed the PRISMA 2020 framework. A total of 628 records were identified through PubMed, Scopus, ScienceDirect, and Google Scholar. After removing 118 duplicate records, 510 records were screened based on titles and abstracts, of which 103 were excluded. The remaining 407 reports were sought for retrieval, and 318 could not be retrieved, leaving 89 reports for full-text eligibility assessment. Following the eligibility assessment, 50

reports were excluded for predefined reasons, and 39 studies met the eligibility criteria and were included in the final review. The complete study selection process is presented in Figure 1.

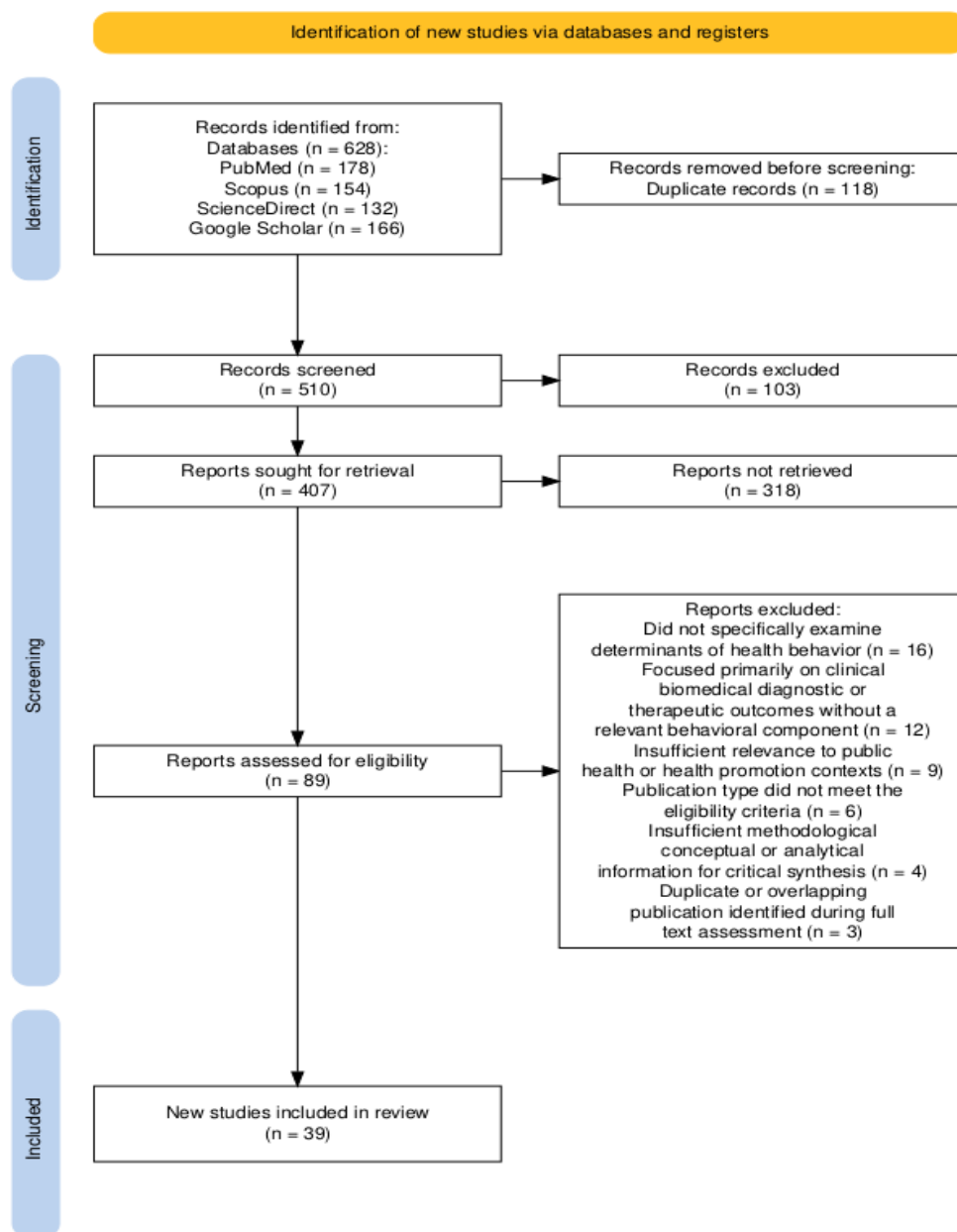


Figure 1. PRISMA Flow Diagram

Characteristics of Included Studies

The 39 included studies published between 2021 and 2026 represented diverse methodological, population, and public health contexts. The evidence base comprised cross-sectional and observational studies, qualitative studies, systematic reviews and meta-analyses, scoping reviews, narrative and conceptual reviews, and other evidence syntheses. The studies

involved adolescents and young people, adults, older adults, patients with chronic diseases, caregivers, communities, and broader population- and policy-level contexts.

The included studies examined preventive behaviors, self-care practices, physical activity, smoking, vaccination, health information seeking, digital health engagement, and health service utilization. Despite variations in study designs, populations, settings, and behavioral outcomes, recurring determinants were identified across the evidence base. The characteristics, determinants identified, and key findings of the included studies are presented in Table 2.

Table 2. Characteristics of Included Studies

Author/Year	Study Characteristics	Determinants Identified	Key Findings
Akter et al. (2023)	Systematic review and meta-analysis of population-level tobacco control studies across multiple countries; examined tobacco use and smoking-related outcomes	Policy and regulatory interventions	Population-level tobacco control interventions were associated with improved tobacco-related behaviors and health outcomes.
Andalib et al. (2024)	Scoping review of built environment evidence across multiple settings; examined health-related behaviors and well-being	Built environment and environmental conditions	Built environment characteristics influenced opportunities for healthy behavior and well-being.
Asrina et al. (2023)	Observational study among postpartum mothers in Indonesia; examined postpartum health practices	Social support and cultural traditions	Social support and cultural practices influenced postpartum health behaviors.
Babygeetha & Devineni (2024)	Systematic review of patients with coronary heart disease and heart failure across multiple countries; examined self-care adherence	Social support	Stronger social support was associated with improved adherence to self-care behaviors.
Bechard et al. (2021)	Cross-sectional study among Canadian adults across age groups; examined COVID-19 preventive behaviors	Health beliefs and risk perception	Differences in health beliefs and risk perceptions influenced preventive behaviors.
Berete et al. (2024)	Cross-sectional study among Belgian adults; examined health-related behaviors and outcomes	Health literacy and socioeconomic status	Health literacy contributed to socioeconomic inequalities in health-related outcomes.
Chidambaram et al. (2024)	Conceptual review of global digital health evidence; examined digital health engagement	Digital access, literacy, infrastructure, and social conditions	Digital influenced health engagement, access, and equity.
Cini et al. (2023)	Qualitative study among adolescents and stakeholders in Indonesia; examined NCD risk behaviors	Policy, social, and structural factors	Prevention of adolescent NCD risk behaviors required responsive policies and multisectoral action.
Cipta et al. (2024)	Narrative review of healthcare contexts in Indonesia and LMICs; examined health behavior modification	Cultural sensitivity and patient-centered care	Culturally sensitive and patient-centered approaches supported health behavior modification.

Author/Year	Study Characteristics	Determinants Identified	Key Findings
Darvishpour et al. (2022)	Cross-sectional study among older adults with hypertension in Iran; examined self-care behaviors	Health literacy and self-efficacy	Higher health literacy and self-efficacy were associated with improved self-care behaviors.
Dzerounian et al. (2022)	Cross-sectional survey among older adults in Canadian social housing; examined health behavior change	Health knowledge and self-efficacy	Knowledge and self-efficacy influenced the capacity to initiate health behavior change.
Ferretti et al. (2023)	Scoping review of global evidence among young people; examined digital health promotion behaviors	Digital accessibility, trust, and engagement	Digital health promotion was influenced by accessibility, trust, and responsiveness to young people's needs.
Frehlich et al. (2022)	Systematic review of general populations across multiple countries; examined physical activity and fitness	Neighborhood built environment	Environmental characteristics influenced opportunities for physical activity and health-related fitness.
Gao et al. (2024)	Cross-sectional study among patients with chronic diseases in China; examined self-management behaviors	Self-efficacy and health literacy	Health literacy and self-efficacy were associated with improved health-related practices.
Guo et al. (2025)	Cross-sectional study among family caregivers in Hong Kong; examined health and service-related behaviors	Social support and service accessibility	Social support and accessible services contributed to caregiver health and well-being.
Holt-Lunstad (2024)	Narrative review of global population evidence; examined health-related behaviors and outcomes	Social connection	Social connection was identified as an important determinant of physical and mental health.
Hu et al. (2021)	Systematic review among children and adolescents across multiple countries; examined physical activity	Individual, social, and environmental factors	Physical activity was influenced by interacting determinants across multiple ecological levels.
Ilitis et al. (2025)	Systematic review of faith communities across multiple settings; examined preventive health behaviors	Religion and faith-community engagement	Faith-community engagement supported culturally responsive public health interventions.
Islam et al. (2023)	Scoping review of primary care populations; examined health promotion behaviors	Self-efficacy, observational learning, and environmental influences	Social Cognitive Theory constructs supported health behavior change.
Ji et al. (2024)	Cross-sectional study among rural residents in China; examined digital health behaviors	Digital literacy and health literacy	Higher digital and health literacy were associated with greater digital health engagement.
Kelly et al. (2025)	Evidence synthesis of public health policy evidence in the United States; examined population health behaviors	Evidence-based policy and implementation capacity	Effective policies required systematic evidence use, implementation capacity, and contextual adaptation.

Author/Year	Study Characteristics	Determinants Identified	Key Findings
Kickbusch et al. (2021)	Global commission report focused on children and young people; examined digital health engagement	Digital governance and structural determinants	Digital governance was essential for protecting health and reducing inequalities.
Kim et al. (2022)	Systematic review and meta-analysis of health promotion programs across multiple countries; examined health behavior change	PRECEDE-PROCEED interventions	PRECEDE-PROCEED-based programs supported improvements in health behaviors and outcomes.
Kite et al. (2023)	Systematic review of public health communication campaigns across multiple countries	Social media exposure and engagement	Social media influenced health behavior through exposure, interaction, and social processes.
Lee et al. (2025)	Observational study among regional populations; examined health behavior patterns	Social determinants and contextual conditions	Health behavior patterns varied according to socioeconomic and contextual conditions.
Li (2025)	Configurational analysis of public health governance systems in China	Governance capacity and structural factors	Governance capacity resulted from combinations of institutional and structural conditions.
Lyles et al. (2023)	Literature synthesis of global digital health evidence; examined digital health access and engagement	Multilevel digital determinants	Digital health equity was shaped by interacting determinants across multiple levels.
Ma et al. (2021)	Cross-sectional study among older adults in China; examined health-related behaviors	Health literacy and socioeconomic status	Health literacy mediated relationships between socioeconomic conditions and health-related outcomes.
Mudd et al. (2024)	Systematic scoping review of health inequality evidence across multiple countries	Socioeconomic and system-level factors	Health behavior inequalities emerged from dynamic interactions among multiple determinants.
Niu et al. (2021)	Cross-sectional survey among social media users in China; examined health information seeking	Health literacy, social media use, and self-efficacy	Health literacy and self-efficacy predicted health information-seeking intentions.
Nurhayati et al. (2022)	Cross-sectional study among Indonesian youth; examined smoking behavior	Tobacco advertising exposure	Exposure to outdoor tobacco advertising was associated with smoking behavior.
Nurmansyah et al. (2022)	Cross-sectional study among Muslim communities in Indonesia; examined COVID-19 preventive behaviors	Religious practices and contextual factors	Religious and contextual factors influenced adherence to preventive behaviors.
Peng et al. (2024)	Cross-sectional study among older adults in China; examined health behaviors during COVID-19	Social support, loneliness, and income	Social support influenced health behaviors through interactions with loneliness and economic conditions.
Rachmawati et al. (2022)	Qualitative study of Islamic faith-based organizations in Indonesia; examined COVID-19 preventive actions	Religious organizations and community engagement	Faith-based organizations supported public health communication and community responses.

Author/Year	Study Characteristics	Determinants Identified	Key Findings
Shmueli (2021)	Cross-sectional study among Israeli adults; examined COVID-19 vaccination intention	Health beliefs and behavioral attitudes	Perceived benefits, barriers, and attitudes predicted vaccination intentions.
Song et al. (2024)	Cross-sectional study among older adults in China; examined physical activity and health behaviors	Perceived built environment	Perceptions of the built environment were associated with health behavior patterns.
Tancred et al. (2024)	Scoping review of health policy and workforce evidence across multiple countries	Intersectoral collaboration and policy	Intersectoral collaboration supported population-level health promotion.
Willmott et al. (2021)	Cross-context empirical study among diverse populations; examined health and social behaviors	Capability, opportunity, and motivation	COM-B components interacted in explaining behavior across different contexts.
Zhang et al. (2022)	Cross-sectional study among the general population in China; examined COVID-19-related health behaviors	Health literacy and health beliefs	Health literacy influenced behavior through pathways involving health beliefs and risk perception.

As shown in Table 2, the included studies demonstrated considerable heterogeneity in methodological approaches, populations, settings, and health behaviors. Nevertheless, recurring patterns of individual, social, environmental, cultural and religious, technological, and policy-related determinants were identified, providing the basis for subsequent categorization and analytical synthesis.

Quality and Critical Appraisal

The included studies demonstrated methodological diversity, requiring the use of design-specific appraisal tools to evaluate methodological quality according to the characteristics of each study type. The findings of the critical appraisal were subsequently considered during the analytical synthesis, with methodological strengths and limitations taken into account when interpreting the consistency and relevance of the evidence.

Table 3. Distribution of Critical Appraisal Tools According to Study Design

Appraisal Tool	Study Design/Evidence Type	Number of Studies
JBI Critical Appraisal Checklist for Systematic Reviews and Research Syntheses	Systematic reviews, meta-analyses, and scoping reviews	10
JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies	Cross-sectional, survey, observational, and related empirical studies	17
JBI Critical Appraisal Checklist for Qualitative Research	Qualitative studies	2
SANRA	Narrative, conceptual, and literature reviews	7
AACODS	Commission reports and evidence syntheses	3
Total		39

The appraisal findings were incorporated into the analytical synthesis rather than used as an automatic exclusion criterion. Methodological strengths and limitations identified through the appraisal process were considered when interpreting the consistency, relevance, and contribution of the evidence across different study designs.

Derivation and Distribution of Health Behavior Determinant Categories

The synthesis identified six major categories of health behavior determinants: individual, social, environmental, cultural and religious, technological, and policy determinants. These categories were derived through thematic categorization of recurring determinants, with conceptually similar factors grouped according to their primary levels and contexts of influence.

Individual determinants were most frequently examined ($n = 12$), followed by social ($n = 7$), technological ($n = 6$), environmental ($n = 5$), policy ($n = 5$), and cultural and religious determinants ($n = 4$). The distribution and principal characteristics of these categories are presented in Table 4.

Table 4. Distribution and Characteristics of Health Behavior Determinant Categories

Category	Main Determinants	Number of Studies
Individual	Knowledge, health literacy, self-efficacy, motivation, perceived risk, perceived benefits	12
Social	Social support, family support, subjective norms, social networks, community participation	7
Environmental	Access to healthcare, built environment, media exposure, supportive environments, facilities	5
Cultural and Religious	Religious beliefs, cultural values, social norms, faith-based organizations	4
Technological	Digital health, mHealth, digital literacy, social media, online health information	6
Policy	Tobacco control, regulations, governance, intersectoral collaboration, population-based interventions	5
Total		39

The distribution indicates a predominant research emphasis on individual-level determinants, whereas cultural and religious, environmental, and policy influences received comparatively less attention. Although organized into six categories for analytical purposes, considerable overlap was observed across categories, indicating that the determinants represent interconnected rather than isolated dimensions of health behavior.

Analytical Synthesis

The analytical synthesis revealed that health behavior is shaped by multiple and interconnected determinants. Although individual factors, particularly health literacy, self-efficacy, knowledge, motivation, and health beliefs, were most frequently examined, their influence was consistently associated with broader social, environmental, cultural, technological, and policy contexts.

Across the included studies, determinants interacted at multiple levels. Social support and environmental conditions influenced individuals' capacity to translate health knowledge and intentions into practice, while technological engagement was shaped by digital literacy, socioeconomic resources, infrastructure, and governance. Cultural, environmental, and policy determinants remained comparatively underexplored despite their relevance to health behavior.

Overall, the findings support a multilevel perspective in which individual, social, environmental, cultural and religious, technological, and policy determinants dynamically interact in shaping health behavior. These interrelationships provide the empirical basis for the framework presented in Figure 2.

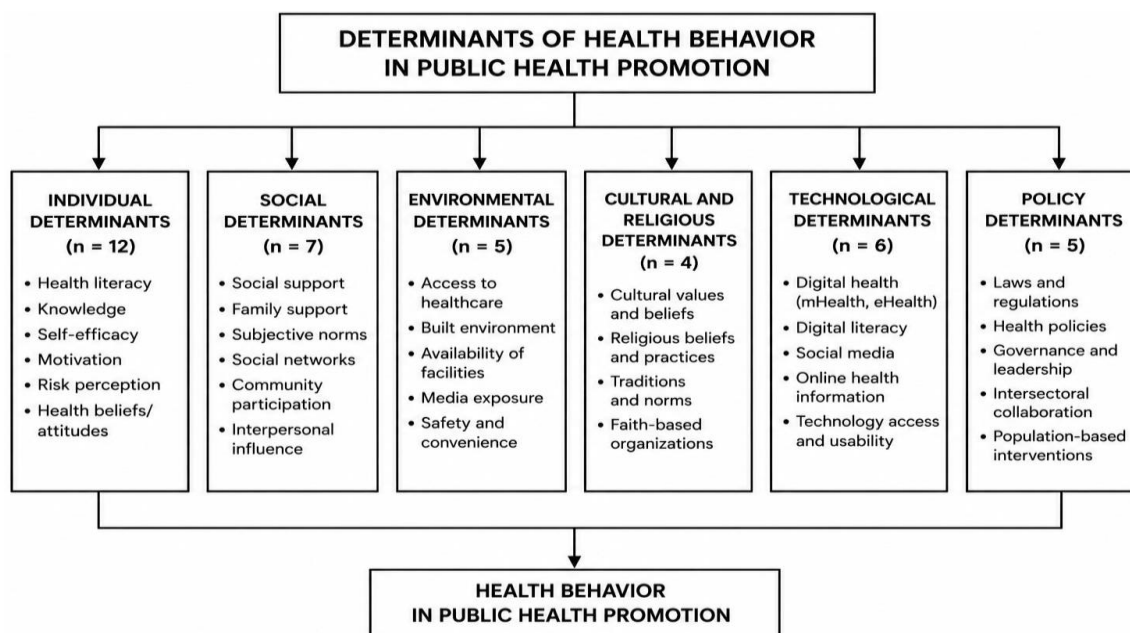


Figure 2. Framework of Health Behavior Determinants

As shown in Figure 2, the framework integrates six interconnected categories of health behavior determinants. Rather than operating independently, individual, social, environmental, cultural and religious, technological, and policy determinants collectively shape health-related decisions and practices across multiple levels of influence. The framework therefore illustrates the multidimensional and interconnected nature of health behavior in the context of public health promotion.

DISCUSSION

Principal Findings and Multilevel Interactions

This critical review demonstrates that health behavior is shaped by multiple determinants operating across interconnected levels of influence. Individual determinants, particularly health literacy, self-efficacy, knowledge, motivation, perceived risk, and health beliefs, were the most frequently investigated factors. Across diverse populations and behavioral contexts, these factors were consistently associated with preventive behaviors, self-care practices, health information seeking, and health-related decision-making (Bechard *et al.*, 2021; Darvishpour *et al.*, 2022; Dzerounian *et al.*, 2022; Gao *et al.*, 2024; Shmueli, 2021; Zhang *et al.*, 2022). The predominance of individual-level determinants suggests that contemporary health behavior research continues to place considerable emphasis on cognitive and psychological explanations of behavioral change.

However, the synthesis also indicates that individual determinants rarely operate independently. Health literacy and individual capabilities are influenced by socioeconomic conditions and broader contextual factors, while physical activity and other health behaviors are

shaped by interactions among individual, social, and environmental influences (Berete *et al.*, 2024; Hu *et al.*, 2021; Ma *et al.*, 2021). Evidence concerning health inequalities further demonstrates that behavioral outcomes emerge from complex relationships among determinants rather than from isolated individual characteristics (Mudd *et al.*, 2024). These findings challenge health promotion approaches that attribute behavioral outcomes primarily to individual knowledge, motivation, or personal responsibility.

The multilevel nature of health behavior is further supported by evidence demonstrating the importance of self-efficacy, observational learning, environmental influences, capability, opportunity, and motivation (Islam *et al.*, 2023; Willmott *et al.*, 2021). Individual capabilities may facilitate behavioral change, but their effects depend on whether social and environmental contexts provide sufficient opportunities and support. Consequently, effective health promotion requires an understanding of the dynamic relationships between individual agency and broader contextual conditions rather than reliance on single-level behavioral explanations.

Social, Environmental, Cultural, and Religious Contexts

Social determinants emerged as important influences on the adoption and maintenance of health behaviors. Social support, family relationships, social connection, and access to social services can provide emotional, informational, and practical resources that strengthen individuals' capacity to engage in self-care and health-promoting practices (Guo *et al.*, 2025; Holt-Lunstad, 2024). The interaction between social support, loneliness, and economic conditions further indicates that interpersonal influences are embedded within broader socioeconomic contexts rather than operating independently (Peng *et al.*, 2024).

Environmental conditions similarly determine whether individual intentions and capabilities can be translated into actual behavior. Built environments, neighborhood characteristics, access to healthcare and other resources, and exposure to health-related or unhealthy environments may create opportunities for or barriers to behavioral change (Andalib *et al.*, 2024; Frehlich *et al.*, 2022; Nurhayati *et al.*, 2022; Song *et al.*, 2024). These findings demonstrate an important distinction between behavioral motivation and behavioral opportunity. Individuals may possess sufficient knowledge, health literacy, and motivation but remain unable to adopt recommended practices when environmental conditions restrict access to supportive resources.

Cultural and religious contexts add another dimension to understanding health behavior. Cultural traditions and social practices may influence health-related decisions, while religious beliefs and faith communities can shape preventive practices, community engagement, and responses to public health interventions (Asrina *et al.*, 2023; Itis *et al.*, 2025; Nurmansyah *et al.*, 2022; Rachmawati *et al.*, 2022). Culturally sensitive and patient-centered approaches may therefore strengthen the relevance and acceptability of behavioral interventions across diverse populations (Cipta *et al.*, 2024).

Despite their importance, cultural and religious determinants received comparatively less attention than individual-level influences. This imbalance represents an important gap because health behaviors occur within specific systems of cultural meaning, social relationships, and community values. Health promotion strategies that overlook these contexts may have limited acceptability, sustainability, or effectiveness. Greater integration of cultural and religious perspectives may therefore contribute to more contextually responsive health promotion interventions.

Technological Determinants and Digital Inequality

Technological determinants have become increasingly important in contemporary health promotion. Digital health platforms, mobile technologies, social media, and online health

information provide opportunities to improve access to health information, facilitate communication, support behavioral interventions, and expand the reach of health promotion programs. Evidence among young people and rural populations indicates that digital accessibility, engagement, health literacy, and digital literacy influence participation in digital health interventions and services (Ferretti *et al.*, 2023; Ji *et al.*, 2024).

However, the benefits of technological innovation are not distributed equally. Digital health engagement is shaped by access, literacy, infrastructure, socioeconomic conditions, and broader social determinants (Chidambaram *et al.*, 2024). Similarly, digital environments and governance structures may influence both opportunities for health promotion and inequalities in access to digital resources (Kickbusch *et al.*, 2021). The multilevel nature of these influences suggests that technological determinants cannot be separated from individual, social, environmental, and structural conditions (Lyles *et al.*, 2023).

Social media represents a particularly complex technological influence. It may facilitate health communication and public engagement but can also shape health information-seeking and behavioral intentions through interactions with health literacy and self-efficacy (Kite *et al.*, 2023; Niu *et al.*, 2021). These findings demonstrate that access to digital technologies alone is insufficient to ensure positive behavioral outcomes.

The evidence therefore highlights digital inequality as an emerging challenge for health promotion. Interventions relying heavily on digital technologies may disproportionately benefit populations with higher digital literacy, socioeconomic resources, and infrastructure while excluding disadvantaged populations. Digital health strategies should consequently incorporate measures to strengthen digital literacy, improve accessibility, promote inclusive design, and address structural inequalities in technological access.

Structural Determinants and Theoretical Integration

Policy and structural determinants have the potential to influence health behavior by modifying social norms, environmental opportunities, access to resources, and exposure to health risks. Population-level tobacco control interventions demonstrate that policy measures can influence behavioral outcomes beyond approaches centered exclusively on individual education and motivation (Akter *et al.*, 2023). Similarly, public health governance, evidence-informed policymaking, and intersectoral collaboration can create structural conditions that facilitate or constrain population health promotion (Kelly *et al.*, 2025; Li, 2025; Tancred *et al.*, 2024).

The effectiveness of policy interventions, however, depends on implementation capacity and responsiveness to population and contextual conditions. Evidence from adolescent noncommunicable disease prevention demonstrates the importance of responsive policies and multisectoral approaches (Cini *et al.*, 2023), while variations in health behavior patterns across socioeconomic and contextual conditions further emphasize the need for locally responsive strategies (Lee *et al.*, 2025). Policy interventions should therefore be integrated with individual, social, community, and environmental strategies rather than implemented as isolated structural measures.

The multidimensional findings of this review are consistent with several established health behavior and health promotion theories. The Social Ecological Model provides a broad perspective for understanding interactions among individual, interpersonal, community, environmental, and policy influences. The importance of health beliefs, perceived risks, benefits, and barriers supports the explanatory relevance of the Health Belief Model, while self-efficacy, observational learning, and environmental influences are consistent with Social Cognitive Theory.

The findings are also compatible with the COM-B framework, in which behavior emerges through interactions among capability, opportunity, and motivation (Willmott *et al.*, 2021). Individual determinants contribute primarily to capability and motivation, whereas social,

environmental, technological, and policy conditions influence opportunities for behavioral change. Similarly, evidence concerning PRECEDE–PROCEED-based interventions demonstrates the relevance of integrating predisposing, reinforcing, and enabling factors in health promotion planning (Kim *et al.*, 2022).

Taken together, these perspectives suggest that no single behavioral theory adequately explains the full range of determinants identified in this review. The evidence supports theoretical integration that combines individual behavioral processes with social, environmental, cultural, technological, and policy influences. Such integration can provide a stronger conceptual foundation for developing comprehensive and context-sensitive health promotion interventions.

Research Gaps and Implications for Health Promotion

Several theoretical, methodological, and empirical gaps emerged from the critical synthesis. Theoretically, existing research continues to place greater emphasis on individual-level determinants than on interactions among broader contextual and structural influences. Although individual constructs such as health literacy, self-efficacy, knowledge, and health beliefs are well represented, fewer studies comprehensively examine how these factors interact with cultural, environmental, technological, and policy conditions.

Methodologically, the evidence base remains characterized by substantial heterogeneity in research designs, populations, behavioral outcomes, and contexts. The considerable representation of cross-sectional and observational research limits causal interpretation and understanding of how determinants and behaviors change over time.

Empirically, cultural and religious influences, structural conditions, policy determinants, and the long-term behavioral consequences of digital health interventions remain comparatively underexplored. Particular attention is needed for populations experiencing socioeconomic disadvantage, restricted access to healthcare, limited digital literacy, and digital exclusion. Greater geographical and cultural diversity in health behavior research is also required to improve the contextual relevance and transferability of evidence.

The findings have important implications for contemporary health promotion. Effective interventions should move beyond strategies focused primarily on increasing knowledge or individual motivation. Multilevel approaches are needed to simultaneously strengthen individual capabilities, mobilize family and community support, improve environmental opportunities, incorporate cultural and religious contexts, ensure equitable access to digital technologies, and establish supportive policy and structural conditions.

Overall, sustainable health behavior change requires an integrated approach that addresses both individual agency and the broader conditions that facilitate or constrain behavioral choices. Health promotion research and practice should prioritize theoretical integration, methodological diversity, health equity, and greater attention to underexplored contextual and structural determinants. Such an approach may contribute to the development of health promotion strategies that are more comprehensive, context-sensitive, equitable, and responsive to the complex determinants shaping contemporary health behavior.

CONCLUSION

This critical review demonstrates that health behavior is shaped by multiple and interconnected determinants operating across individual, social, environmental, cultural and religious, technological, and policy levels. Although individual determinants, particularly health literacy, self-efficacy, knowledge, motivation, and health beliefs, were the most frequently examined, these factors do not operate independently but interact with broader social

relationships, environmental opportunities, cultural contexts, technological conditions, and policy environments.

The findings highlight the need to move beyond approaches focused primarily on individual knowledge and motivation toward multilevel and context-sensitive health promotion strategies. Effective and equitable behavior change requires the integration of individual capabilities, social and community support, supportive environments, cultural and religious considerations, equitable access to digital technologies, and enabling policy conditions. Overall, an integrated multilevel perspective provides a stronger foundation for developing comprehensive, equitable, and sustainable health promotion strategies.

LIMITATION

This review has several limitations. The literature search was restricted to English-language publications published between 2021 and 2026 and identified through PubMed, Scopus, ScienceDirect, and Google Scholar, which may have excluded relevant studies indexed in other databases or published in other languages. The diversity of study designs, populations, health behaviors, and research contexts also introduced methodological and contextual heterogeneity that limited direct comparison across studies. Furthermore, although methodological quality was assessed using design-appropriate critical appraisal tools, the synthesis remained dependent on the methodological rigor and reporting quality of the included studies. Finally, the broad scope of health behavior determinants may have limited in-depth analysis of specific determinants, populations, or behavioral contexts. Nevertheless, this broad scope enabled a multidimensional and multilevel synthesis of the evidence and facilitated the identification of important theoretical, methodological, and empirical gaps for future research.

RECOMMENDATION

Based on the findings of this review, health promotion programs should adopt comprehensive and multisectoral approaches that address individual, social, environmental, cultural and religious, technological, and policy-related determinants. Interventions should integrate efforts to strengthen individual capabilities and social support with supportive environments, community participation, culturally sensitive approaches, equitable access to health resources and digital technologies, and evidence-based policies.

Future research should employ longitudinal, experimental, mixed-method, and other robust methodological approaches to examine causal relationships and interactions among determinants across diverse sociocultural and healthcare contexts. Greater attention should also be given to underexplored cultural, structural, technological, and policy determinants to support the development of more effective, equitable, and context-responsive health promotion interventions.

REFERENCES

- Akter, S., Islam, M. R., Rahman, M. M., Rouyard, T., Nsashiyi, R. S., Hossain, F., & Nakamura, R. (2023). Evaluation of Population-Level Tobacco Control Interventions and Health Outcomes: A Systematic Review and Meta-Analysis. *JAMA Network Open*, 6(7), E2322341. <https://doi.org/10.1001/jamanetworkopen.2023.22341>
- Andalib, E., Temeljotov-Salaj, A., Steinert, M., Johansen, A., Aalto, P., & Lohne, J. (2024). The Interplay Between the Built Environment, Health, and Well-Being—A Scoping Review. In *Urban Science* (Vol. 8, Number 4). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/urbansci8040184>

- Asrina, A., Payapo, R., Idris, F. C., Palutturi, S., & Mallongi, A. (2023). Health Behavior and Social Support in Postpartum Mothers Treatment in Ba'ukup Tradition in Maluku. *Pharmacognosy Journal*, 15(3), 438–442. <https://doi.org/10.5530/pj.2023.15.98>
- Babygeetha, A., & Devineni, D. (2024). Social Support and Adherence to Self-Care Behavior Among Patients With Coronary Heart Disease and Heart Failure: A Systematic Review. In *Europe's Journal of Psychology* (Vol. 20, Number 1, pp. 63–77). PsychOpen. <https://doi.org/10.5964/ejop.12131>
- Bechard, L. E., Bergelt, M., Neudorf, B., DeSouza, T. C., & Middleton, L. E. (2021). Using the Health Belief Model to Understand Age Differences in Perceptions and Responses to the COVID-19 Pandemic. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.609893>
- Berete, F., Gisle, L., Demarest, S., Charafeddine, R., Bruyère, O., Van den Broucke, S., & Van der Heyden, J. (2024). Does health literacy mediate the relationship between socioeconomic status and health related outcomes in the Belgian adult population? *BMC Public Health*, 24(1). <https://doi.org/10.1186/s12889-024-18676-7>
- Chidambaram, S., Jain, B., Jain, U., Mwavu, R., Baru, R., Thomas, B., Greaves, F., Jayakumar, S., Jain, P., Rojo, M., Battaglini, M. R., Meara, J. G., Sounderajah, V., Celi, L. A., & Darzi, A. (2024). An introduction to digital determinants of health. In *PLOS Digital Health* (Vol. 3, Number 1 January). Public Library of Science. <https://doi.org/10.1371/journal.pdig.0000346>
- Cini, K. I., Wulan, N. R., Dumuid, D., Nurjannah Triputri, A., Abbsar, I., Li, L., Priambodo, D. A., Sameve, G. E., Camellia, A., Francis, K. L., Sawyer, S. M., Patton, G. C., Ansariadi, A., & Azzopardi, P. S. (2023). Towards responsive policy and actions to address non-communicable disease risks amongst adolescents in Indonesia: insights from key stakeholders. *The Lancet Regional Health - Southeast Asia*, 18. <https://doi.org/10.1016/j.lansea.2023.100260>
- Cipta, D. A., Andoko, D., Theja, A., Utama, A. V. E., Hendrik, H., William, D. G., Reina, N., Handoko, M. T., & Lumbuun, N. (2024). Culturally sensitive patient-centered healthcare: a focus on health behavior modification in low and middle-income nations—insights from Indonesia. *Frontiers in Medicine*, 11. <https://doi.org/10.3389/fmed.2024.1353037>
- Darvishpour, A., Mansour-Ghanaei, R., & Mansouri, F. (2022). The Relationship Between Health Literacy, Self-Efficacy, and Self-Care Behaviors in Older Adults With Hypertension in the North of Iran. *Health Literacy Research and Practice*, 6(4), e262–e269. <https://doi.org/10.3928/24748307-20221013-01>
- Dzerounian, J., Pirrie, M., AlShenaiber, L., Angeles, R., Marzanek, F., & Agarwal, G. (2022). Health knowledge and self-efficacy to make health behaviour changes: a survey of older adults living in Ontario social housing. *BMC Geriatrics*, 22(1). <https://doi.org/10.1186/s12877-022-03116-1>
- Ferretti, A., Hubbs, S., & Vayena, E. (2023). Global youth perspectives on digital health promotion: a scoping review. *BMC Digital Health*, 1(1). <https://doi.org/10.1186/s44247-023-00025-0>
- Frehlich, L., Christie, C. D., Ronksley, P. E., Turin, T. C., Doyle-Baker, P., & McCormack, G. R. (2022). The neighbourhood built environment and health-related fitness: a narrative

- systematic review. In *International Journal of Behavioral Nutrition and Physical Activity* (Vol. 19, Number 1). BioMed Central Ltd. <https://doi.org/10.1186/s12966-022-01359-0>
- Gao, Y., Zheng, Y., He, Y., Lin, J., Liu, F., Fu, J., & Lin, R. (2024). The relationship between self-efficacy, health literacy, and quality of life in patients with chronic diseases: a cross-sectional study in China. *Frontiers in Public Health*, 12. <https://doi.org/10.3389/fpubh.2024.1430202>
- Guo, S., Chen, Q., & Chan, K. L. (2025). Social contextual factors, social support and accessibility of social services in the health and life satisfaction of family caregivers in Hong Kong. *BMC Public Health*, 25(1). <https://doi.org/10.1186/s12889-025-23307-w>
- Holt-Lunstad, J. (2024). Social connection as a critical factor for mental and physical health: evidence, trends, challenges, and future implications. *World Psychiatry*, 23(3), 312–332. <https://doi.org/10.1002/wps.21224>
- Hu, D., Zhou, S., Crowley-Mchattan, Z. J., & Liu, Z. (2021). Factors that influence participation in physical activity in school-aged children and adolescents: A systematic review from the social ecological model perspective. In *International Journal of Environmental Research and Public Health* (Vol. 18, Number 6, pp. 1–20). MDPI AG. <https://doi.org/10.3390/ijerph18063147>
- Ittis, A. S., Baker, L. L., Baldwin, K., Cruz, L., Yaeger, L. H., & DuBois, J. M. (2025). Approaches to engaging faith communities in public health efforts regarding vaccination, genetics, and colorectal cancer: a systematic review. In *BMC Public Health* (Vol. 25, Number 1). BioMed Central Ltd. <https://doi.org/10.1186/s12889-025-21903-4>
- Islam, K. F., Awal, A., Mazumder, H., Munni, U. R., Majumder, K., Afroz, K., Tabassum, M. N., & Hossain, M. M. (2023). Social cognitive theory-based health promotion in primary care practice: A scoping review. In *Heliyon* (Vol. 9, Number 4). Elsevier Ltd. <https://doi.org/10.1016/j.heliyon.2023.e14889>
- Ji, H., Dong, J., Pan, W., & Yu, Y. (2024). Associations between digital literacy, health literacy, and digital health behaviors among rural residents: evidence from Zhejiang, China. *International Journal for Equity in Health*, 23(1). <https://doi.org/10.1186/s12939-024-02150-2>
- Kelly, M. A., Puddy, R. W., Siddiqi, S. M., Nelson, C., Ntazinda, A. H., Kucik, J. E., Hall, D., Murray, C. T., & Tomoaia-Cotisel, A. (2025). Distilling the Fundamentals of Evidence-Based Public Health Policy. In *Public Health Reports* (Vol. 140, Number 1, pp. 40–47). SAGE Publications Ltd. <https://doi.org/10.1177/00333549241256751>
- Kickbusch, I., Piselli, D., Agrawal, A., Balicer, R., Banner, O., Adelhardt, M., Capobianco, E., Fabian, C., Singh Gill, A., Lupton, D., Medhora, R. P., Ndili, N., Ryś, A., Sambuli, N., Settle, D., Swaminathan, S., Morales, J. V., Wolpert, M., Wyckoff, A. W., ... Wong, B. L. H. (2021). The Lancet and Financial Times Commission on governing health futures 2030: growing up in a digital world. In *The Lancet* (Vol. 398, Number 10312, pp. 1727–1776). Elsevier B.V. [https://doi.org/10.1016/S0140-6736\(21\)01824-9](https://doi.org/10.1016/S0140-6736(21)01824-9)
- Kim, J., Jang, J., Kim, B., & Lee, K. H. (2022). Effect of the PRECEDE-PROCEED model on health programs: a systematic review and meta-analysis. *Systematic Reviews*, 11(1). <https://doi.org/10.1186/s13643-022-02092-2>
- Kite, J., Chan, L., MacKay, K., Corbett, L., Reyes-Marcelino, G., Nguyen, B., Bellew, W., &

- Freeman, B. (2023). A Model of Social Media Effects in Public Health Communication Campaigns: Systematic Review. In *Journal of Medical Internet Research* (Vol. 25). JMIR Publications Inc. <https://doi.org/10.2196/46345>
- Lee, S., Yoon, S., & Kim, H. (2025). Regional Variations in Health Behavior Structures: A Social Determinants of Health Approach. *Healthcare (Switzerland)*, 13(20). <https://doi.org/10.3390/healthcare13202557>
- Li, J. (2025). Factors influencing national public health governance capacity: based on NCA and fsQCA. *Frontiers in Public Health*, 13. <https://doi.org/10.3389/fpubh.2025.1628677>
- Lyles, C. R., Nguyen, O. K., Khoong, E. C., Aguilera, A., & Sarkar, U. (2023). Multilevel Determinants of Digital Health Equity: A Literature Synthesis to Advance the Field. *Annual Review of Public Health*, 44(1), 383–405. <https://doi.org/10.1146/annurev-publhealth-071521-023913>
- Ma, T., Meng, H., Ye, Z., Jia, C., Sun, M., & Liu, D. (2021). Health Literacy Mediates the Association Between Socioeconomic Status and Productive Aging Among Elderly Chinese Adults in a Newly Urbanized Community. *Frontiers in Public Health*, 9. <https://doi.org/10.3389/fpubh.2021.647230>
- Mudd, A. L., Bal, M., Verra, S. E., Poelman, M. P., de Wit, J., & Kamphuis, C. B. M. (2024). The current state of complex systems research on socioeconomic inequalities in health and health behavior—a systematic scoping review. In *International Journal of Behavioral Nutrition and Physical Activity* (Vol. 21, Number 1). BioMed Central Ltd. <https://doi.org/10.1186/s12966-024-01562-1>
- Niu, Z., Willoughby, J., & Zhou, R. (2021). Associations of health literacy, social media use, and self-efficacy with health information seeking intentions among social media users in China: Cross-sectional survey. *Journal of Medical Internet Research*, 23(2). <https://doi.org/10.2196/19134>
- Nurhayati, N., Kusuma, D., Tarigan, A. A., Siregar, P. A., Hasibuan, R. R. A., & Ahsan, A. (2022). Exposure to Outdoor Tobacco Advertisements Near Home is Associated with Smoking among Youth in Indonesia. *Asian Pacific Journal of Cancer Prevention*, 23(7), 2179–2183. <https://doi.org/10.31557/APJCP.2022.23.7.2179>
- Nurmansyah, M. I., Handayani, S., Kurniawan, D. W., Rachmawati, E., Hidayati, & Alim, A. M. (2022). Congregational Worshiping and Implementation of the COVID-19 Preventive Behavioral Measures During the Re-opening Phase of Worship Places Among Indonesian Muslims. *Journal of Religion and Health*, 61(5), 4169–4188. <https://doi.org/10.1007/s10943-022-01593-7>
- Peng, J., Qi, H., Fan, Z., Zhou, Q., & Lin, Y. (2024). Social support and health behaviors of older adults during the COVID-19 pandemic in China: a moderated mediation model of loneliness and economic income. *BMC Public Health*, 24(1). <https://doi.org/10.1186/s12889-024-20272-8>
- Rachmawati, E., Umniyatun, Y., Rosyidi, M., & Nurmansyah, M. I. (2022). The roles of Islamic Faith-Based Organizations on countermeasures against the COVID-19 pandemic in Indonesia. *Heliyon*, 8(2). <https://doi.org/10.1016/j.heliyon.2022.e08928>
- Shmueli, L. (2021). Predicting intention to receive COVID-19 vaccine among the general

population using the health belief model and the theory of planned behavior model. *BMC Public Health*, 21(1), 804. <https://doi.org/10.1186/s12889-021-10816-7>

Song, Y., Wang, Y., Zhou, M., Suo, Z., Wang, X., Li, C., Feng, X., Cheng, J., & Yu, H. (2024). Association between the perceived built environment and health behaviors in older adults: a cross-sectional study from Beijing, China. *BMC Geriatrics*, 24(1). <https://doi.org/10.1186/s12877-024-05285-7>

Tancred, T., Caffrey, M., Falkenbach, M., & Raven, J. (2024). The pathway to health in all policies through intersectoral collaboration on the health workforce: a scoping review. *Health Policy and Planning*, 39, i54–i74. <https://doi.org/10.1093/heapol/czae046>

Willmott, T. J., Pang, B., & Rundle-Thiele, S. (2021). Capability, opportunity, and motivation: an across contexts empirical examination of the COM-B model. *BMC Public Health*, 21(1). <https://doi.org/10.1186/s12889-021-11019-w>

Zhang, H., Chen, L., & Zhang, F. (2022). Revisit the Effects of Health Literacy on Health Behaviors in the Context of COVID-19: The Mediation Pathways Based on the Health Belief Model. *Frontiers in Public Health*, 10. <https://doi.org/10.3389/fpubh.2022.917022>