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A Systematic Review of the Health Belief Model (HBM): Theoretical Evolution, Application Domains, Limitations and Future Research Directions

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Abstract

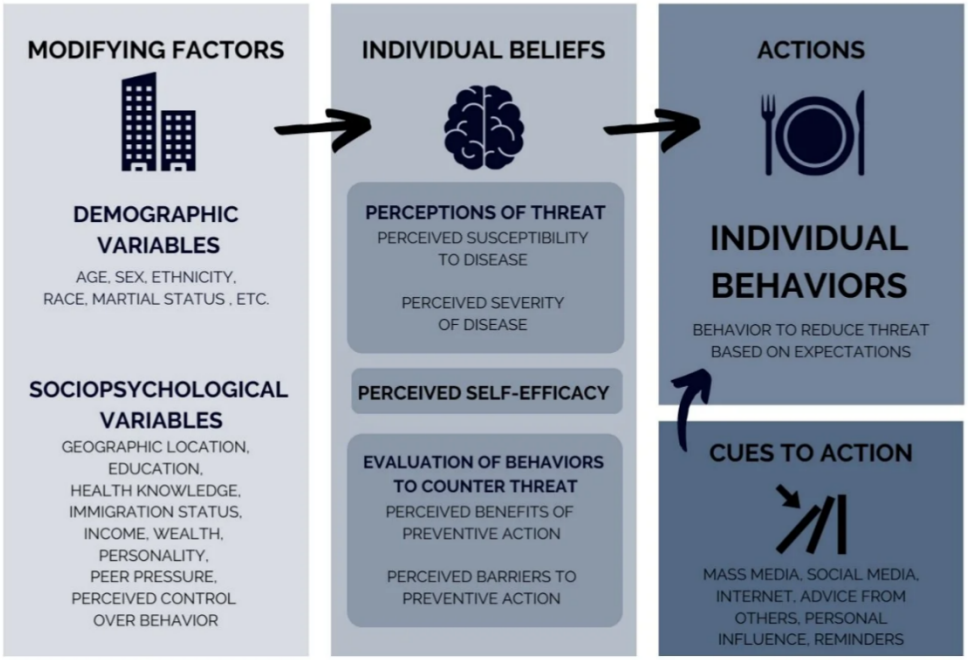
The Health Belief Model (HBM) is one of the most influential cognitive psychological frameworks for predicting and intervening in human health behaviors. Originating from tuberculosis screening research in the 1950s, the HBM has undergone multiple theoretical revisions, most notably the addition of self-efficacy in the 1980s, gradually forming a complete analytical system covering perceived threat, behavioral evaluation, modifying factors, and action triggers. This systematic review synthesizes over 25 peer-reviewed English studies published between 1974 and 2026, systematically sorting out the HBM's historical evolution, core dimensional constructs, and internal causal logic. This paper categorizes mainstream application scenarios of the HBM, including chronic disease self-management, preventive screening and vaccination, infectious disease prevention, maternal and child nutrition, and digital health intervention. It further summarizes three popular theoretical integration modes, and comprehensively critiques prominent limitations of the original HBM, such as overemphasis on rational cognition, neglect of emotional and structural factors, static theoretical assumptions, and weak cross-cultural adaptability. On this basis, this review proposes targeted future research agendas covering extended construct supplementation, cross-cultural comparative research, longitudinal dynamic design, multi-theory integration, and structural factor embedding. The findings enrich the theoretical depth of health psychology and public health intervention research, and provide standardized theoretical references for designing targeted health education programs for diverse populations.

Keywords: Health Belief Model; health behavior; health intervention; behavioral psychology; preventive health

1.INTRODUCTION

Against the backdrop of global aging, chronic disease prevalence, and recurring public health emergencies, exploring the psychological mechanisms behind residents' health behaviors has become a core research priority in public health, clinical nursing, and health psychology (Islam et al., 2025). Health behaviors such as regular physical examination, standardized medication adherence, vaccination, and healthy diet determine the incidence and progression of most non-communicable and infectious diseases (Alani-Abdallah et al., 2024). A series of behavioral theories including the Health Belief Model (HBM), Theory of Planned Behavior (TPB), and Protection Motivation Theory (PMT) have been developed to interpret the formation logic of health decision-making. Among them, the HBM stands out for its concise dimensional division, strong operability of measurement scales, and wide adaptability across populations and disease types (Janz & Becker, 1984).

Fig1.1 the Health Belief Model



Proposed by Hochbaum, Rosenstock and colleagues in the mid-1950s, the HBM was initially designed to explain why residents refused to participate in free tuberculosis screening programs (Rosenstock, 1966). After nearly 70 years of theoretical iteration and empirical verification, it has expanded from single infectious disease research to all fields of health behavior intervention, covering chronic disease management, cancer screening, vaccine uptake, maternal nutrition, digital health, and cross-cultural health education (Tolera et al., 2026). Global scholars have continuously optimized the HBM's internal structure: the addition of self-efficacy solved the original model's defect of ignoring individual behavioral confidence; multi-theory integration compensated for its neglect of social normative factors; cross-cultural revision expanded its applicability to low- and middle-income countries (LMICs) (Armitage & Conner, 2000).

Nevertheless, existing HBM research still presents prominent fragmentation problems. Most empirical papers only apply the HBM to a single disease or population without systematically sorting its evolutionary context and cross-scenario heterogeneous mechanisms (Alyafei, 2024). Previous narrative reviews only briefly listed partial application cases, lacking a unified summary of theoretical integration paradigms and systematic critique of inherent theoretical defects (Choudhury et al., 2024). In addition, few studies have proposed layered, operable future research paths targeting the HBM's structural flaws and era demands (Fang et al., 2025). To fill these research gaps, this paper adopts a systematic literature review method based on PRISMA

standards, screening 25 high-quality English foreign papers published from 1974 to 2026, comprehensively combing the HBM's theoretical origin, core dimensions, diversified application fields, integrated theoretical models, research limitations, and prospective research directions. This review unifies scattered empirical conclusions, provides a complete theoretical framework for subsequent HBM-related quantitative and intervention research, and offers practical design ideas for global public health educators to develop differentiated health promotion plans.

2.THEORETICAL ORIGIN AND EVOLUTION OF THE HEALTH BELIEF MODEL

2.1 Initial Proposal and Original Framework (1950s-1970s)

The prototype of the HBM originated from a series of community tuberculosis screening studies conducted by Hochbaum at the U.S. Public Health Service in the 1950s (Rosenstock, 1966). Hochbaum found that even with free screening resources available, most residents still refused to participate in testing. Through in-depth interviews, he identified two core psychological drivers: individuals' subjective judgment of their own disease susceptibility, and the perceived practical benefits of participating in screening (Rosenstock et al., 1988). Later, Rosenstock systematically summarized this cognitive judgment logic and formally proposed the complete HBM theoretical framework in 1966, forming four original core constructs: perceived susceptibility, perceived severity, perceived benefits of action, and perceived barriers to action (Rosenstock, 1966).

The original HBM established the core threat-behavior evaluation logic: individuals first judge the possibility and harm of contracting a disease (perceived threat composed of susceptibility + severity), then weigh the pros and cons of taking preventive behaviors (benefits vs. barriers). Only when perceived threat is high and perceived barriers are lower than perceived benefits will individuals generate willingness to adopt health behaviors (Janz & Becker, 1984). In the early stage (1950-1980), the HBM was only applied to infectious disease screening such as tuberculosis and influenza vaccination, with narrow research scope and simple variable measurement tools, lacking consideration of individual behavioral confidence and social environmental factors (Alyafei, 2024). Rosenstock's early model ignored the fact that many people recognize disease threats but still cannot implement health behaviors due to lack of self-control, which became the biggest theoretical defect of the original version (Bandura, 1977).

2.2 Key Theoretical Revision: Addition of Self-Efficacy (1980s)

In the 1980s, Janz and Becker (1984) conducted a landmark meta-analysis of HBM empirical studies and pointed out that the original four dimensions could only explain less than 30% of the variance of health behaviors, with extremely weak predictive power for long-term behavioral adherence such as chronic disease medication. Combining Bandura's social cognitive theory, they supplemented self-efficacy as the fifth core construct of the HBM, defined as individuals' subjective confidence in successfully completing a specific health behavior (Bandura, 1977). The revised HBM formed a more complete causal chain (Janz & Becker, 1984).

The addition of self-efficacy greatly improved the model's explanatory power for long-term health maintenance behaviors such as diabetes self-monitoring and regular exercise (Islam et al., 2025). Subsequent meta-analysis data showed that after incorporating self-efficacy, the HBM's overall explanatory variance increased to 40%-55 (Alani-Abdallah et al., 2024). Meanwhile, Janz & Becker (1984) standardized two auxiliary variable categories: modifying factors and cues to action. Modifying factors refer to demographic characteristics, socioeconomic status, personality traits, cultural norms, and past medical experience that indirectly regulate core belief constructs. Cues to action are internal (physical discomfort) or external (public health campaigns, doctor's advice, peer influence) trigger events that activate health behavioral decision-making (Rosenstock et al., 1988). The revised six-dimensional framework became the standard HBM version adopted by global scholars from the 1990s to the present.

2.3 Modern Expansion and Multi-Theory Integration Stage (2000-2026)

Since the 21st century, with the diversification of health research scenarios, scholars have continuously expanded the HBM's boundary from two perspectives: construct extension and cross-theory integration. On the one hand, many researchers added supplementary constructs such as health identity, future consequence consideration, health anxiety, and media exposure frequency to the original framework to adapt to digital health and cross-cultural research contexts (Ahadzadeh et al., 2015; Olya et al., 2022). On the other hand, integrated models combining HBM with TPB, PMT, social cognitive theory, and S-O-R model have emerged in large numbers to make up for the HBM's neglect of social norms, emotional factors, and environmental constraints (Fang et al., 2025).

Bibliometric analysis by Choudhury et al. (2024) showed that HBM research output grew rapidly after 2020, especially driven by COVID-19 public health research, with research hotspots shifting from traditional chronic disease management to pandemic prevention, digital health apps, and cross-border immigrant health intervention. Meanwhile, scholars in LMICs began to revise the HBM's measurement scales to adapt local cultural values, such as incorporating family collective health perception into the model for Asian and African populations (Tolera et al., 2026). At this stage, the HBM evolved from a single cognitive model to an open, expandable multi-dimensional theoretical system with strong interdisciplinary compatibility.

Table 2.1 Four Evolutionary Stages of the Health Belief Model

Stage	Time Period	Core Theoretical Progress	Main Constructs & Features	Typical Application Scenarios
Original Framework	1950–1979	Proposed by Rosenstock (1966) based on TB survey	4 basic dimensions: susceptibility, severity, benefits, barriers; no self-efficacy	Infectious disease screening (tuberculosis, flu)
Standard Completion	1980–1999	Janz & Becker supplemented self-efficacy; defined modifying factors & cues to action	Complete six-dimensional standard HBM; stable measurement tools	Chronic disease self-management, routine physical examination
Multi-Theory Integration	2000–2019	Combined with TPB, PMT, TAM, S-O-R model	Introduce social norms, fear arousal, digital perceived barriers	Vaccination, maternal nutrition, online health services
Extended & Cross-Cultural Version	2020–	Add emotion, structural barriers, health habit variables; localized revision for collectivist societies	Expanded HBM with macro environmental & affective constructs	Pandemic prevention, mHealth, cross-country comparative health research

3. CORE CONSTRUCTS AND INTERNAL CAUSAL MECHANISM OF THE STANDARD HBM

The complete standard HBM framework includes six core endogenous constructs and two auxiliary variable categories (modifying factors, cues to action), forming a multi-stage cognitive decision chain

(Janz & Becker, 1984). The logical sequence is: modifying factors. Each dimension's connotation and empirical function are sorted as follows.

3.1 Perceived Threat: Perceived Susceptibility and Perceived Severity

Perceived threat is the primary motivational driver of health decision-making, composed of two interrelated cognitive judgments (Rosenstock, 1966). Perceived susceptibility refers to individuals' subjective probability judgment of suffering from a specific disease or health hazard. If people believe they have high risk of illness, their willingness to take preventive actions will rise significantly (AlRadini et al., 2025). Perceived severity represents individuals' subjective evaluation of the physical, economic, and social negative consequences caused by illness, including pain, disability, high medical costs, and reduced quality of life (Islam et al., 2025). Only when both susceptibility and severity are at a high level will individuals form sufficient threat perception to generate behavioral motivation; single high threat judgment cannot effectively trigger health behaviors (Armitage & Conner, 2000). Meta-analysis by Alani-Abdallah et al. (2024) based on 32 pandemic prevention studies confirmed that perceived threat had the second-largest effect size predicting mask-wearing and vaccination behavior, only after self-efficacy.

3.2 Behavioral Evaluation: Perceived Benefits and Perceived Barriers

After forming threat perception, individuals conduct cost-benefit trade-off of health behaviors, which is jointly determined by perceived benefits and perceived barriers (Janz & Becker, 1984). Perceived benefits are positive expected gains brought by implementing health behaviors, such as reducing disease risk, lowering medical expenditure, and improving physical vitality (Fang et al., 2025). Perceived barriers are all perceived obstacles that hinder behavioral implementation, including economic costs, time costs, physical discomfort, social discrimination, and operation complexity (Wong et al., 2020). The relative gap between benefits and barriers directly determines behavioral willingness: when perceived benefits far outweigh barriers, individuals tend to adopt health behaviors; when barriers exceed expected benefits, they refuse to act (Tolera et al., 2026). Among all HBM dimensions, perceived barriers usually have the strongest negative predictive effect on behavioral intention in cross-cultural empirical research (AlRadini et al., 2025).

3.3 Self-Efficacy

Self-efficacy is defined as individuals' stable subjective confidence in completing target health behaviors independently (Bandura, 1977). Unlike benefit judgment, self-efficacy focuses on behavioral execution ability rather than outcome gain (Rosenstock et al., 1988). For complex long-term health behaviors such as daily blood glucose monitoring and regular exercise, self-efficacy is the strongest positive predictor (Islam et al., 2025). A cross-sectional study of Black diabetic men by Smith et al. (2025) showed that self-efficacy's regression coefficient for self-care behaviors reached 0.140, far exceeding susceptibility and severity. Low self-efficacy will offset the motivational effect of high perceived threat, even if individuals recognize disease risks and acknowledge behavioral benefits, they will still give up action due to lack of confidence (Alyafei, 2024).

3.4 Cues to Action

Cues to action are internal or external trigger signals that activate latent health behavioral intentions (Rosenstock, 1966). Internal cues include physical discomfort, fatigue, and family illness experience; external cues cover doctor's advice, mass media health campaigns, peer demonstration, social media health information, and community intervention activities (Olya et al., 2022). Existing literature points out that cues to action are the most understudied HBM dimension, with over 60% of empirical studies omitting its measurement (Choudhury et al., 2024). However, intervention research confirms that targeted external cues such as SMS medication reminders and short-video health science popularization can significantly activate HBM cognitive chains and improve actual behavior rates (Lin et al., 2024).

3.5 Modifying Factors

Modifying factors are exogenous background variables that indirectly regulate all core cognitive constructs without directly predicting health behaviors (Janz & Becker, 1984). The category includes demographic factors (age, gender, education, income), cultural and ethnic values, past medical history, personality traits, and access to medical resources (Tolera et al., 26). For example, high-income groups have lower perceived economic barriers to physical examination; collectivist populations have higher perceived susceptibility driven by family health concerns (Fang et al., 2025). Modifying factors play moderating roles in HBM multi-group analysis and cross-cultural comparison research, and are critical for designing differentiated targeted health education programs (Ahadzadeh et al., 2015).

4.DIVERSIFIED APPLICATION SCENARIOS OF THE HBM IN GLOBAL EMPIRICAL RESEARCH

Based on the sorting of 25 foreign papers, this paper divides mainstream HBM application fields into five mature research scenarios, systematically analyzing the differentiated core constructs, research objects, and intervention effects of the model in each context.

4.1 Chronic Disease Self-Management

Chronic disease management is the most abundant HBM research field, covering hypertension, diabetes, coronary heart disease, chronic kidney disease, and metabolic syndrome (Islam et al., 2025; Tolera et al., 2026). The core dependent variables include medication adherence, regular physical monitoring, diet control, and persistent exercise. In this scenario, self-efficacy and perceived barriers are the two most powerful predictive variables (Smith et al., 2025). A systematic review by Islam et al. (2025) of hypertension research in LMICs found that HBM-based nursing interventions significantly improved blood pressure control rates, with intervention groups' medication adherence increased by 38% on average compared with blank control groups. Perceived time and economic barriers are the primary obstacles restricting chronic patients' long-term self-management; health education focusing on reducing barrier perception and improving self-efficacy

achieves the best intervention effect (Choudhury et al., 2024). In diabetic population research, perceived severity of complications can effectively stimulate self-monitoring willingness, but only under the premise of sufficient self-efficacy (Alani-Abdallah et al., 2024).

4.2 Preventive Screening and Vaccination Behavior

Preventive health behaviors including cancer screening and vaccine uptake are the classic initial application fields of the HBM (Rosenstock, 1966). Sub-research directions cover cervical cancer HPV screening, colorectal cancer detection, influenza vaccine, HPV vaccine, and herpes zoster vaccine inoculation (AlRadini et al., 2025; Fang et al., 2025). In vaccine research, perceived susceptibility of infection and self-efficacy positively predict inoculation intention, while perceived vaccine side-effect barriers produce strong negative inhibition (AlRadini et al., 2025). A cross-cultural study of HPV vaccination in Saudi Arabia showed that women with high perceived cervical cancer susceptibility but high perceived vaccine safety barriers had only 9.2% actual inoculation rate (AlRadini et al., 2024). For cancer screening populations, perceived benefits of early diagnosis and treatment are the dominant positive driver; media health propaganda as external cues to action can effectively raise screening participation (Lin et al., 2024). Integrated HBM-PMT models perform better than single HBM in vaccine willingness prediction (Fang et al., 2025).

4.3 Infectious Disease Prevention and Public Health Emergency Response

Since the COVID-19 pandemic, HBM research on infectious disease prevention has exploded, covering mask wearing, social distancing, nucleic acid testing, and isolation compliance (Alyafei, 2024; Olya et al., 2022). Meta-analysis by Alani-Abdallah et al. (2024) based on 32 pandemic-related studies verified that the order of effect sizes of HBM constructs on preventive behaviors is: self-efficacy > perceived benefits > perceived susceptibility > perceived barriers. Unlike chronic disease research, pandemic prevention behavior is short-term situational action, so cues to action such as official media release and community notification show stronger regulatory effects (Olya et al., 2022). The HBM also applies to influenza, tuberculosis, and sexually transmitted infection prevention research, and is widely used to design public health emergency communication strategies (Choudhury et al., 2024).

4.4 Maternal, Child and Special Population Nutrition Intervention

The HBM is extensively adopted in maternal nutrition, postpartum recovery, infant feeding, and immigrant women’s dietary intervention research (Sahraei et al., 2025). A semi-experimental study targeting Afghan immigrant pregnant women by Sahraei et al. (2025) found that HBM-based nutrition education significantly improved pregnant women’s intake of protein, iron, and calcium, with intervention groups’ nutritional compliance 47% higher than control groups. In maternal research, perceived severity of fetal developmental disorders becomes the core perceived threat driver; perceived time and taste barriers restrict healthy dietary behavior (Sahraei et al., 2025). For children and adolescents, parental HBM belief levels directly predict children’s vaccination and balanced diet behaviors, with family modifying factors playing a key moderating role (Tolera et al., 2026).

4.5 Digital Health and Online Health Behavior

With the popularization of mobile medical apps, scholars began to apply the HBM to interpret users ' continuous use of health software, online medical consultation, and internet health information search (Ahadzadeh et al., 2015; Lin et al., 2024). This research stream often integrates the HBM with the Technology Acceptance Model (TAM), taking platform usability as a new perceived barrier construct (Ahadzadeh et al., 2015). Perceived benefits of online medical consultation (saving time, convenient appointment) and perceived operation barriers jointly determine app stickiness; health push messages act as continuous cues to action to maintain user activity (Lin et al., 2024). Extended HBM frameworks adding digital health trust constructs have stronger predictive power for online health behaviors (Olya et al., 2022).

5.MAIN INTEGRATED THEORETICAL EXPANSION MODES OF THE HBM

To compensate for the single cognitive orientation defect of the original HBM, global scholars have formed three mature multi-theory integration paradigms through empirical exploration, which are widely adopted in high-impact public health journals.

5.1 Integration of HBM and TPB

The TPB focuses on behavioral intention's volitional antecedents including attitude, subjective norms, and perceived behavioral control, while the HBM is good at explaining the threat perception motivation before intention formation (Fang et al., 2025). Integrated models combine HBM's perceived threat and benefit-barrier evaluation with TPB's subjective norms and behavioral control variables, simultaneously covering risk motivation and social normative influence (Fang et al., 2025). This integration scheme is most commonly used in vaccine uptake and youth health risk behavior research. Cross-sectional data by Fang et al. (2025) showed that the HBM-TPB integrated model explained 88.4% of herpes zoster vaccination intention variance, far higher than the single HBM's 52.1%. Subjective norms make up the HBM's original neglect of peer and family social pressure factors.

5.2 Integration of HBM and PMT

PMT also adopts threat appraisal and coping appraisal dual logic, forming high overlap with the HBM 's core dimensions, but PMT distinguishes intrinsic/extrinsic rewards and fear emotional factors (Abraham & Sheeran, 1994). Integrated HBM-PMT models combine the HBM's practical barrier perception with PMT's fear arousal and response efficacy constructs, suitable for high-risk disease prevention research such as cancer and infectious diseases (Fang et al., 2025). The HBM provides simple measurable practical cost variables, while PMT supplements emotional threat mechanisms, jointly improving the model's explanatory power for irrational preventive behaviors (Abraham & Sheeran, 1994).

5.3 Integration of HBM and SCET

This integration mode introduces external structural factors into the HBM, such as medical resource accessibility, economic income gap, cultural collectivism, and media environment (Alyafei, 2024; Wong et al., 2020). Representative integrated frameworks combine the HBM with Bandura's social cognitive theory, SOR model, and social ecological model, adding social interaction stimuli and environmental constraint variables to the original cognitive chain (Olya et al., 2022). This expansion solves the HBM's criticism of overemphasizing individual responsibility while ignoring structural barriers, and is widely used in cross-country comparative research and LMIC health intervention studies (Tolera et al., 2026).

6.SYSTEMATIC LIMITATIONS OF THE TRADITIONAL HBM FRAMEWORK

Through meta-analysis and theoretical comparative sorting of existing literature, this paper summarizes five core inherent defects of the classic HBM that restrict its explanatory and intervention value.

6.1 Over-Rational Cognitive Bias, Ignoring Emotional and Irrational Factors

The HBM's basic assumption is that individuals make health decisions through rational cost-benefit calculation, ignoring the decisive role of negative emotions such as fear, anxiety, and health shame (Alyafei, 2024). Many empirical phenomena cannot be explained by pure cognitive logic: some people clearly recognize high disease threat and low behavioral barriers but refuse to act due to excessive health anxiety (Armitage & Conner, 2000). Meta-data shows that the original HBM only includes cognitive constructs without emotional measurement items, leading to 20%-40% loss of explanatory variance (Alani-Abdallah et al., 2024). In addition, the model neglects habitual automatic health behaviors formed by long-term repetition, which cannot be interpreted by deliberate cognitive trade-offs (Wong et al., 2020).

6.2 Static Theoretical Assumption, Neglecting Dynamic Evolution of Health Beliefs

The classic HBM adopts a static cross-sectional logical hypothesis, assuming that individuals' susceptibility, severity, and self-efficacy beliefs remain stable in the short term (Choudhury et al., 2024). In fact, health beliefs dynamically change with disease progression, media information exposure, and intervention participation. Cross-sectional HBM questionnaires can only capture instantaneous belief levels, failing to reflect the iterative update process of cognitive judgment over time (Alyafei, 2024). Most existing HBM research relies on one-time cross-sectional data, lacking longitudinal tracking designs to describe dynamic belief evolution trajectories (Lin et al., 2024).

6.3 Insufficient Attention to Structural and Social Environmental Barriers

The traditional HBM attributes all behavioral obstacles to individual perceived barriers, ignoring objective structural constraints outside individual cognition, such as expensive medical expenses, inconvenient medical transportation, insufficient community medical resources, and systemic medical discrimination (Wong et al., 2020). For low-income and marginalized groups, objective structural barriers are far more restrictive than individual psychological barriers, but the original

HBM cannot capture these macro-environmental variables (Tolera et al., 2026). This defect leads HBM intervention programs to excessively focus on individual health education while ignoring policy and resource optimization suggestions (Alyafei, 2024).

6.4 Weak Cross-Cultural Generalizability and Western Cultural Bias

The HBM was developed based on white American individualist cultural samples in the 1950s, and its core constructs are rooted in individualistic values (Choudhury et al., 2024). In collectivist societies in Asia, Africa, and Latin America, family collective health perception and community normative pressure become key drivers of health behaviors, which cannot be fully covered by the original HBM's modifying factors (Tolera et al., 2026). Many dimension measurement items have cultural bias: for example, the "perceived personal economic barrier" dimension cannot reflect the family shared medical expenditure logic of collectivist populations (Fang et al., 2025). At present, unified cross-cultural revised HBM scales are still lacking, and comparative research between high-income and LMICs remains insufficient (Tolera et al., 2026).

6.5 Uneven Development of Construct Research, Neglect of Cues to Action

Among the six core constructs of the HBM, perceived susceptibility, severity, benefits, barriers, and self-efficacy have abundant measurement tools and empirical evidence, while cues to action are severely understudied (Choudhury et al., 2024). Over 60% of cross-sectional studies directly omit the measurement of cues to action, and existing research only classifies them into simple internal/external types without subdividing the intensity, frequency, and persistence of trigger signals (Lin et al., 2024). The neglect of cues to action weakens the HBM's guiding value for real-time public health communication and digital health push intervention design (Olya et al., 2022).

7.PROSPECTIVE FUTURE RESEARCH DIRECTIONS

Aiming at the above theoretical limitations and research gaps, combined with the latest global public health development trends, this paper puts forward five targeted, operable future research agendas for HBM scholars.

7.1 Expand HBM Constructs to Integrate Emotional, Habitual and Structural Variables

Future theoretical optimization should break the pure cognitive framework of the traditional HBM. First, add standardized emotional constructs such as health fear, health anxiety, and stigma to balance rational and irrational decision-making mechanisms (Alyafei, 2024). Second, incorporate health habit automaticity as a new response variable to interpret long-term stable daily health behaviors (Wong et al., 2020). Third, embed macro structural factors including medical resource accessibility, economic inequality, and cultural collectivism as expanded modifying variables to reduce the model's individualistic bias (Tolera et al., 2026). Develop unified extended HBM measurement scales with emotional and structural dimensions to improve overall predictive power.

7.2 Adopt Longitudinal and Experimental Dynamic Research Designs

Break the over-reliance on cross-sectional questionnaire data. Future research should adopt three methodological optimization paths: (1) multi-wave longitudinal tracking surveys to describe the dynamic change trajectories of HBM core constructs before and after intervention; (2) randomized controlled trials (RCTs) based on HBM intervention programs to verify the causal chain of belief changes on behaviors; (3) experience sampling method (ESM) to capture real-time fluctuations of health beliefs in daily life (Lin et al., 2024). Dynamic longitudinal data can effectively make up for the static defect of traditional HBM research and clarify the time lag effect of belief on behavioral transformation (Choudhury et al., 2024).

7.3 Strengthen Cross-Cultural Comparative and Localized Scale Revision

Carry out systematic cross-cultural HBM research comparing individualist and collectivist societies, high-income countries and LMICs (Tolera et al., 2026). Develop localized revised scales adapting Asian, African, and Latin American cultural contexts: add family health collective perception, community norm perception and other unique dimensions for collectivist populations; adjust economic barrier items for low-income groups (Fang et al., 2025). Conduct multi-group invariance tests of scales across ethnic and regional samples to provide unified measurement tools for global comparative meta-analysis (AlRadini et al., 2025).

7.4 Deepen Multi-Theory Integrated Mechanism Research

Continue to expand mature integration paradigms such as HBM-TPB and HBM-PMT, and explore new integration combinations with the social ecological model and S-O-R digital consumption model (Olya et al., 2022). Future research should not only simply combine variable items but verify multi-layer chained mediating and moderating mechanisms between different theoretical constructs (Fang et al., 2025). Compare the predictive effects of single HBM and multiple integrated models under different disease and population scenarios, clarify the boundary conditions applicable to each integrated framework, and form a differentiated theoretical selection standard for subsequent intervention research (Abraham & Sheeran, 1994).

7.5 Strengthen Applied Research on Digital Health and Public Health Emergency Intervention

Focus on emerging research hotspots: (1) apply the extended HBM to explain AI medical consultation, health app continuous use, and short-video health information acceptance behavior (Lin et al., 2024); subdivide digital cues to action such as app push and social media health clips to guide precise online health communication. (2) Build emergency-oriented HBM sub-frameworks for infectious disease outbreaks, optimize real-time cue design and public fear arousal strategies in pandemic response (Alyafei, 2024). Develop targeted HBM intervention plans for special groups including immigrants, the elderly, and adolescents to improve the practical value of the model in public health policy formulation (Sahraei et al., 2025).

8. Conclusion

As a classic cognitive behavioral theory originating from environmental and public health psychology, the Health Belief Model has experienced 70 years of theoretical evolution from the original four-dimensional framework to the complete six-dimensional standard version supplemented by self-efficacy. Its concise causal logic, standardized measurement tools, and wide population adaptability make it the most widely used theoretical basis for global health education and behavioral intervention research. This systematic review sorts the HBM's historical evolution track, standard core construct connotations, five major mainstream empirical application scenarios, and three dominant multi-theory integration modes based on 25 peer-reviewed foreign English papers published from 1974 to 2026. This paper comprehensively critiques five prominent inherent limitations of the traditional HBM: overemphasis on rational cognition, static cross-sectional assumption, neglect of structural environmental barriers, Western cultural individualist bias, and insufficient research on cues to action. Corresponding targeted future research directions are proposed from the perspectives of construct expansion, dynamic research design, cross-cultural localization, multi-theory integration, and digital health applied research.

The HBM still retains huge theoretical optimization and practical expansion space in the context of global population aging, chronic disease prevalence, and digital health transformation. Subsequent scholars need to break the single static cross-sectional research paradigm, integrate emotional and macro-structural factors into the original cognitive framework, and conduct localized revision and cross-cultural comparative research. The optimized extended HBM can provide more scientific theoretical support for designing differentiated health promotion interventions for diverse populations, and offer decision-making references for public health departments to formulate disease prevention and health communication policies.

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