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REVIEW

MODEL-BASED HEALTH PROMOTION OF INFORMATION, MOTIVATION AND BEHAVIORAL SKILLS IN NON-COMMUNICABLE DISEASES: A SCOPING REVIEW

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Abstract

Introduction. The global burden of non-communicable diseases (NCDs) is largely driven by modifiable lifestyle behaviors. The Information-Motivation-Behavioral Skills (IMB) model provides a structured framework for promoting health behavior change, yet its application across NCD contexts remains inconsistent.

The objective of this scoping review was to map existing studies employing the IMB model in NCD-related health promotion, identifying target populations, intervention characteristics, and reported outcomes.

Material and methods. The review followed Joanna Briggs Institute (JBI) and PRISMA-ScR guidelines. Systematic searches were conducted in PubMed, ScienceDirect, and Scopus using a PCC (Population, Concept, Context) framework. Eligible studies included adult populations and IMB-based interventions from primary research such as randomized controlled or quasi-experimental designs.

Résumé

Introduction. Le fardeau mondial des maladies non transmissibles (MNT) est en grande partie lié à des comportements liés au mode de vie qui peuvent être modifiés. Le modèle "Information-Motivation-Compétences comportementales" (IMB) offre un cadre structuré pour favoriser le changement des comportements en matière de santé, mais son application dans les différents contextes liés aux MNT reste inégale.

L'objectif de cette revue exploratoire visait à recenser les études existantes utilisant le modèle IMB dans le cadre de la promotion de la santé liée aux MNT, en identifiant les populations cibles, les caractéristiques des interventions et les résultats rapportés.

Materiel et méthodes. Cette revue a suivi les lignes directrices du Joanna Briggs Institute (JBI) et du PRISMA-ScR. Des recherches systématiques ont été menées dans PubMed, ScienceDirect et Scopus à l'aide d'un cadre PCC (Population, Concept, Contexte). Les

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Results. 473 records screened, 10 studies met inclusion criteria, primarily from China and Iran, targeting diabetes, coronary heart disease, epilepsy, and HIV/AIDS. Interventions were delivered in-person or digitally (e.g., WeChat, mobile apps). IMB-based programs consistently improved medication adherence, self-management behaviors, self-efficacy, and clinical outcomes (e.g., HbA1c). Motivational interviewing and behavioral skills training were key components, while digital formats enhanced accessibility though long-term effects remain uncertain.
Conclusions. The IMB model is a versatile and effective framework for guiding health promotion across diverse NCDs. Future studies should include larger samples, extended follow-up, and comparisons with other behavioral models to optimize intervention effectiveness.

Keywords: chronic disease, health promotion, psychological, behavioral models.

List of abbreviations:
AR: allergic rhinitis
CHD: coronary heart disease
EBF: exclusive breastfeeding
HbA1c: glycated hemoglobin
HIV/AIDS: human immunodeficiency virus / acquired immunodeficiency syndrome
HPV: human papillomavirus
IMB: Information-Motivation-Behavioral Skills
JBI: Joanna Briggs Institute
MeSH: Medical Subject Headings
MI: motivational interviewing
NCDs: non-communicable diseases
OHSS: ovarian hyperstimulation syndrome
PCC: Population, Concept, Context
PRISMA-ScR: Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews
QoL: quality of life
RCT: randomized controlled trial
SLIT: sublingual immunotherapy
T2DM: type 2 diabetes mellitus

Résultats. Sur 473 publications examinées, 10 études répondaient aux critères d'inclusion; elles provenaient principalement de Chine et d'Iran et portaient sur le diabète, les maladies coronariennes, l'épilepsie et le VIH/SIDA. Les interventions ont été mises en œuvre en présentiel ou par voie numérique (par exemple, via WeChat ou des applications mobiles). Les programmes basés sur le modèle IMB ont systématiquement amélioré l'observance thérapeutique, les comportements d'autogestion, l'auto-efficacité et les résultats cliniques (par exemple, le taux d'HbA1c). L'entretien motivationnel et la formation aux compétences comportementales constituaient des éléments clés, tandis que les formats numériques amélioraient l'accessibilité, bien que les effets à long terme restent incertains.
Conclusions. Le modèle IMB est un cadre polyvalent et efficace pour orienter la promotion de la santé dans le cadre de diverses maladies non transmissibles. Les études futures devraient inclure des échantillons plus importants, un suivi prolongé et des comparaisons avec d'autres modèles comportementaux afin d'optimiser l'efficacité des interventions.

Mots-clés: maladies chroniques, promotion de la santé, psychologie, modèles comportementaux.

Introduction

The global burden of chronic diseases, aging populations, and preventable health risks continues to strain health systems worldwide[1]. Non-communicable diseases (NCDs) such as cardiovascular disease, diabetes, and cancer account for over 70% of all global deaths, with lifestyle behaviors such as poor adherence to treatment, physical inactivity, and inadequate self-care acting as key contributing factors[2]. As life expectancy increases, particularly in low- and middle-income countries, the need for effective, sustainable health promotion strategies becomes even more urgent [3].

In response, behavior change models have been widely applied to guide health promotion interventions[4]. Among these, the Information Motivation Behavioral Skills (IMB) model has gained recognition for its comprehensive and adaptable framework. Originally developed for HIV prevention, the IMB model emphasizes the interplay of three constructs: relevant health information, personal motivation, social inspiration and specific behavioral skills needed to enact and maintain change[5]. Its application has since extended to a range of conditions including diabetes[6], hypertension[7], and mental health[8].

However, despite growing interest, research applying the IMB model in health promotion is still disorganized. For example, a recent integrative review from Palestine broadly mapped health promotion models without detailing the specific mechanisms of IMB[9]. Study from South Korea conducted a systematic review of IMB-based interventions but focused only on behavior change without appropriate alignment to the context[10]. Similarly, study from USA emphasized motivation in health promotion but lacked a comprehensive model-based analysis[11]. Although individual studies such as China [2] and Iran[7] have validated the effectiveness of the IMB model in chronic disease management, there is limited evidence on how the model is operationalized across different populations, settings, and target behaviors.

The objective of this scoping review was to explore and synthesize existing literature on the use of the IMB model in health promotion interventions, identifying target populations, intervention characteristics, delivery formats, and reported outcomes. By mapping the breadth and nature of IMB applications, this review seeks to clarify its role in guiding evidence based and theory driven health promotion strategies.

Materials and methods

Study Design

This scoping review was conducted in accordance with the methodology recommended by the Joanna Briggs Institute (JBI)[13], which includes the following steps: (1) identifying the review objective, (2) developing eligibility criteria aligned with the objective, (3) describing the planned approach to evidence searching, selection, data extraction, and presentation, (4) conducting the evidence search, (5) selecting relevant evidence, (6) extracting data, (7) analyzing the findings, and (8) presenting the results. The review also adhered to the PRISMA Extension for Scoping Reviews (PRISMA-ScR) guidelines[14].

Search Strategy

The research question was constructed using the Participants Concept Context (PCC) framework to guide inclusion decisions. This review focused on adult populations who received health promotion interventions, specifically those applying the Information Motivation Behavioral Skills (IMB) model within community or public health settings. A comprehensive search was carried out across three international databases PubMed, ScienceDirect, and Scopus without restrictions on publication year. The search strategy incorporated both controlled vocabulary, such as Medical Subject Headings (MeSH), and relevant keywords including "health promotion," "information motivation behavioral skills," "health education," "intervention," and "health services." The strategy was refined iteratively to ensure the identification of all relevant literature. Full search terms and strategies are presented in the supplementary materials.

Eligibility Criteria

The review included primary research articles published in English that focused on health promotion interventions based on the IMB model. Eligible studies included experimental studies and randomized controlled trials (RCTs), involving human adult participants. Studies were excluded if they involved children, applied theoretical frameworks other than the IMB model, or consisted of non-primary research such as reviews, editorials, or preclinical studies. Further exclusions were made based on discrepancies in study design, population characteristics, publication type, or relevance of outcomes to the IMB constructs.

Study Selection

All identified studies were imported into Rayyan AI software for screening[15]. Two independent reviewers (YLR and RS) screened titles and abstracts based on the predefined criteria. Full texts of potentially eligible articles were then retrieved and evaluated for final inclusion. Any disagreements were resolved through discussion, and if necessary, a third reviewer (SS) was consulted to reach agreement.

Articles were categorized as "included", "excluded" or "maybe" during the selection process. Thematic merging of the findings was performed using a standardized data extraction template to summarize study characteristics. Extracted variables included author, publication year, country, study title, design, population, intervention, duration, control or comparator group, and outcomes.

Data Extraction

Data extraction was conducted using a standardized form to ensure consistency and completeness, following JBI guidance[13]. Variables extracted included author(s), year of publication, study location, study design, intervention details, IMB constructs applied, and key outcomes. A PRISMA flowchart is provided to illustrate the study selection process.

Results

A total of 473 articles were identified from three major databases: PubMed, ScienceDirect, and Scopus. After the removal of 38 duplicates, 435 records remained for title and abstract screening. Of these, 403 were excluded for not meeting the inclusion

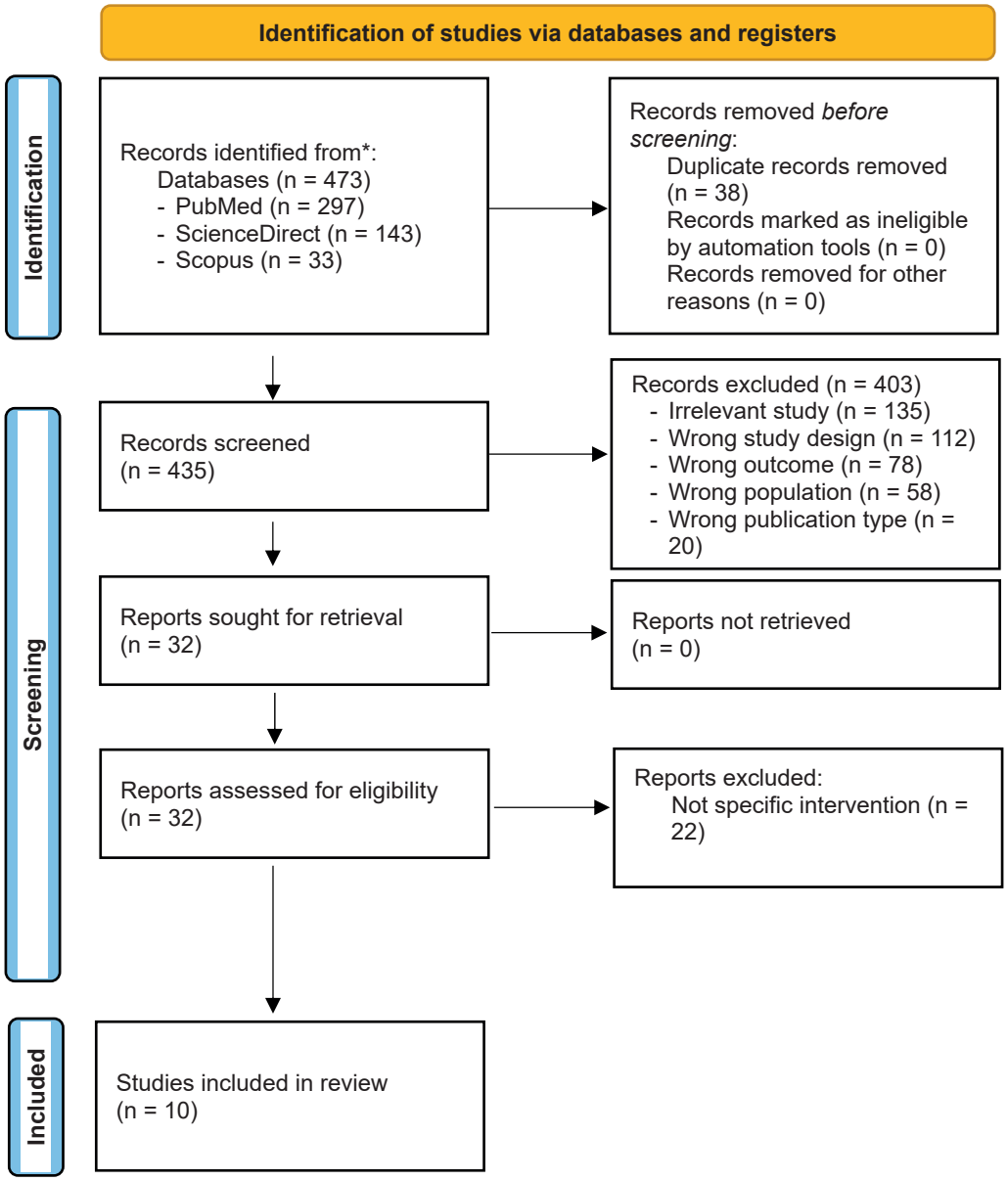


Figure 1. PRISMA flowchart diagram

criteria related to population, study design, or intervention model. The full texts of the remaining 45 articles were assessed in detail. Following further evaluation, 32 were excluded for reasons such as lack of IMB model application or unclear health outcomes. Finally, 10 studies were included in this scoping review (Figure 1).

These studies were conducted in various countries, with a predominance in China and Iran, and involved diverse populations including patients with ovarian hyperstimulation syndrome[16], allergic rhinitis[17], epilepsy[18], type 2 diabetes[6], HIV/AIDS[19], and coronary heart disease[20], as well as pregnant women and breastfeeding mothers[21,22]. The majority of studies employed randomized controlled trials (RCTs) or quasi-experimental designs.

Interventions were based on the IMB model framework, encompassing three major components: the delivery of tailored health-related information, motivation enhancement through interviews or digital platforms, and skill-building sessions for behavioral change[23]. Outcomes assessed included medication adherence, self-efficacy, quality of life, symptom control, and health behavior adherence[24].

Among the key findings, IMB-based interventions consistently showed positive impacts on patient self-management, motivation, and behavior change[20,25]. For instance, IMB-informed cardiac rehabilitation and diabetes self-care programs demonstrated improvements in clinical indices such as HbA1c[6], cardiopulmonary fitness[20], and general self-efficacy.

Table 1. Main characteristics of the studies

Author (Year)	*Country*	*Population*	*Study Design*	*Target Behavior*	*Intervention Type*	*Outcome Summary*
Liu & Yan[16]	China	OHSS patients	RCT	Self-care & psychological state	Information, Motivation, Behavioral Intervention (28 days)	The IMB model intervention improved patient understanding, reduced negative psychological states, enhanced treatment confidence, and improved quality of life in OHSS patients, though the small sample size was a limitation.
Wang et al.[26]	China	Female college students	Quasi-experiment (control group)	HPV vaccination	7-day Web-based education	Web-based education significantly improved knowledge about HPV vaccination among female students, but had limited effect on motivation and behavioral skills within a short-term follow-up.
Wang et al.[17]	China	AR patients using SLIT	Historical control trial	Medication adherence	IMB via WeChat (info, motivation, skill training)	The IMB-based WeChat intervention improved SLIT adherence, self-efficacy, medication beliefs, and knowledge in allergic rhinitis patients, although symptom severity and QoL were not measured.
Yu et al.[27]	China	Post-op hallux valgus patients	Quasi-experiment	Postoperative rehabilitation	IMB-guided rehab with info, motivation, and behavior training	Rehabilitation based on IMB model led to improved limb function, reduced complications, enhanced self-efficacy, and better quality of life post hallux valgus surgery.
Xu & Wang[18]	China	Epilepsy patients	RCT	Self-management & adherence	Health education via IMB (5 stage plan)	IMB-based health education for epilepsy patients improved self-management skills, medication adherence, and quality of life through a personalized, stage-based approach, but generalizability is limited.
Li & Zhu[20]	China	CHD patients	Quasi-experiment	Cardiac rehab adherence	IMB Mode-II (info, motivation, sports guidance)	Cardiac rehab using the IMB model improved cardiopulmonary function, physical fitness, and general self-efficacy in coronary heart disease patients, although long-term effects were not studied.
Gavgani et al.[6]	Iran	T2DM patients	Quasi-experiment	Self-care & HbA1c	2 sessions + follow-up based on IMB	IMB interventions led to improved diabetes self-care behaviors and lower HbA1c levels in T2DM patients, supported by a short-term, cost-effective model; however, the study had limited generalizability due to sample size and setting.
Ameri et al.[19]	Iran	HIV/AIDS patients	Quasi-experiment	Medication, diet, physical activity adherence	8 training sessions over 12 weeks	IMB model intervention enhanced diet adherence in HIV/AIDS patients, but did not significantly improve medication or physical activity adherence; findings limited by single-center design and self-report tools.
Tuthill et al.[22]	South Africa	HIV-infected mothers	RCT	Exclusive breastfeeding (EBF)	Brief MI session using IMB	Motivational interviewing with IMB model improved self-efficacy, which significantly predicted initiation and duration of exclusive breastfeeding among HIV-infected mothers in South Africa.
Shirzad et al.[21]	Iran	Pregnant women	RCT (protocol)	Mode of delivery choice	IMB face-to-face vs IMB-App vs MI	Protocol study comparing face-to-face and mobile app-based IMB interventions on delivery mode choice among pregnant women; aims to assess intentions, self-efficacy, and actual delivery choice, but faces limitations with self-reporting and tech access.

Digital adaptations, including WeChat and mobile app-based interventions[17], were also reported to enhance medication knowledge and health behavior adherence.

A detailed summary of the included studies, their designs, interventions, populations, and main outcomes is provided in Table 1.

Discussion

To the best of our knowledge, this article is the first scoping review to broadly map the application of the IMB skills model in health promotion across different populations, clinical conditions, and intervention services. The review incorporates evidence from ten studies using IMB-based interventions aimed at improving health-related behaviors, including medication adherence, self-care, quality of life, and behavioral outcomes such as rehabilitation adherence and preventive care use. The findings support the flexibility and effectiveness of the IMB model as a theoretical foundation for health promotion strategies across multiple health domains.

IMB-based interventions consistently improved medication adherence, self-management, and self-efficacy[24]. According to the IMB framework, successful behavior change requires the integration of accurate health information, personal and social motivation, and the development of practical behavioral skills[12]. This theory was validated by findings from studies in China, where structured IMB interventions led to measurable improvements in medication adherence and treatment confidence among patients with epilepsy[18] and allergic rhinitis[17]. For instance, WeChat-based intervention significantly enhanced patients' medication beliefs and knowledge, demonstrating how the IMB framework translates into concrete behavioral improvements in real-world settings[17].

Another theme that emerged was the effectiveness of digital and mobile health platforms in delivering IMB constructs. The digitization of IMB interventions increases the adaptability of this model by providing ongoing informational support, interactive motivational cues, and remote skill reinforcement. Studies from China[26] and Iran[21] show that web- and app-based IMB interventions are not only applicable but also partially effective, especially in improving health knowledge and awareness. For example, study from China observed a significant increase in HPV-related knowledge after a 7-day web-based IMB program, although motivational and behavioral outcomes require longer follow-up to be fully demonstrated[26].

The IMB model has also demonstrated success in a variety of health contexts, ranging from reproductive health and infectious diseases to chronic conditions and post-operative rehabilitation. This supports the theoretical strength of the IMB model as a framework that can be applied to a wide array of health behaviors. Studies involving populations with diabetes[6], coronary heart disease[20], HIV/AIDS, and postpartum rehabilitation[27] confirm that the IMB approach results in positive health behavior outcomes. For example, study from Iran reported a significant reduction in HbA1c and improved self-care practices in patients with type 2 diabetes following an IMB-based intervention[6].

Crucially, behavioral skills training emerged as a pivotal factor in driving sustained behavioral change and measurable health outcomes[18]. Even when individuals are informed and motivated, the lack of practical skills can hinder implementation[28]. The IMB model accounts for this by emphasizing the acquisition and rehearsal of relevant behaviors. In the study from China, bedside behavioral training significantly accelerated postoperative recovery among hallux valgus patients, supporting the idea that hands-on skill development enhances self-efficacy and functional recovery[27].

Motivational components, particularly personalized interviewing and patient-centered counselling also play an important role in promoting emotional engagement and health-related decision-making[29,30]. The IMB framework recognizes the importance of internal and social motivators. Study from China showed that motivational interviewing improved psychological state and treatment adherence in OHSS patients[16], while study from South Africa found that improving motivational components led to higher initiation and continuation of exclusive breastfeeding among HIV-positive mothers[22]. These findings suggest that motivational processes are important for successful IMB, especially when tailored to individual needs and psychosocial context[31].

When compared with prior reviews that focused narrowly on single conditions such as HIV or diabetes, this scoping review expands the field by including a broader range of health contexts and populations. It also highlights the evolution of IMB applications from traditional face-to-face settings to more dynamic, digitally mediated environments. The included studies demonstrated a mix of robust methodologies, including RCTs and quasi-experiments, and covered varied populations from different countries, thereby enhancing the generalizability of the findings.

However, several limitations must be acknowledged. Many of the included studies were conducted in single centers with small sample sizes, limiting statistical power and external validity. Several studies, including those on HPV vaccination and SLIT

adherence, lacked long-term follow-up data, making it difficult to assess sustained behavior change. Outcome indicators often focused on knowledge and adherence but overlooked psychosocial well-being, patient satisfaction, or healthcare utilization. Furthermore, this scoping review did not include formal quality appraisal or meta-analysis due to its broad exploratory nature, and publication bias may exist due to the exclusion of non-English studies.

Conclusions

This scoping review highlights the broad applicability and effectiveness of the IMB model as a theoretical framework for health promotion across diverse clinical contexts and populations. IMB-based interventions consistently improved medication adherence, self-care behaviors, psychological, and quality of life, particularly when tailored through digital platforms and enhanced by motivational interviewing and behavioral skills training. The findings support the IMB model's potential to inform scalable, patient-centered interventions, though future research should address limitations such as small sample sizes, short follow-up durations, and the absence of psychosocial outcome measures, while exploring comparative effectiveness with other behavioral frameworks.

Author Contributions:

I.Y. conceived the original draft preparation. I.Y., Y.L.R.D., R.S., and S.S. were responsible for the conception and design of the review. I.Y. was responsible for the data acquisition. I.Y. was responsible for the collection and assembly of the articles/published data, and their inclusion and interpretation in this review. All authors contributed to the critical revision of the manuscript for valuable intellectual content. All authors have read and agreed with the final version of the manuscript.

Compliance with Ethics Requirements:

"The authors declare no conflict of interest regarding this article"

"The authors declare that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national law. Informed consent was obtained from all the patients included in the study"

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