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## Integrating the health belief model into health education programs in a clinical setting

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### Abstract

The article demonstrates that health belief model (HBM)-based health education in hypertensive patients effectively improves blood pressure control and medication adherence at 3 months and 6 months. The HBM addresses perceived barriers, benefits, susceptibility, severity, and self-efficacy, leading to better health behaviors. HBM-based education has been effective in various contexts, including managing chronic diseases, promoting cancer screenings, and preventing infectious diseases. However, the model has limitations, such as cultural applicability and addressing complex health behaviors influenced by environmental factors. Future research should integrate HBM with other theories and conduct longitudinal studies to assess long-term impacts. Despite these limitations, HBM-based education significantly improves patient outcomes, highlighting its potential in health education and promotion when appropriately adapted and implemented. This reinforces the model's value in designing effective health interventions and advancing public health.

**Key Words:** Health belief model; Hypertension; Health education; Health behavior; Intervention

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**Core Tip:** Improving health outcomes involves boosting patient self-efficacy and highlighting the benefits of healthy behaviors. Additionally, addressing and reducing perceived barriers makes it easier for patients to engage in and maintain healthy behaviors. For a more effective health education framework, utilizing comprehensive interventions that combine the health belief model with other behavioral theories and various educational methods is essential.

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## TO THE EDITOR

We read the article by Wang *et al*[1] with great interest. The authors implemented health education based on the health belief model (HBM) in hypertensive patients, finding that at 3 months and 6 months, the intervention group had lower systolic and diastolic blood pressures and higher medication adherence compared to the control group. Additionally, perceived barriers were lower, while self-efficacy, perceived benefits, susceptibility, and severity were higher in the intervention group. The initial three months of health education included lectures, brochures, videos, and counseling sessions.

## HEALTH EDUCATION CAN EASILY BE NEGLECTED IN A BUSY OUTPATIENT SETTING

While not all patients adhere to health behaviors due to education, it remains an essential intervention for almost all diseases. Some adhere to health behaviors well, but why do others not engage in healthy behaviors despite knowing their benefits? The HBM is used to explain this phenomenon. It was developed by social psychologists at the United States Public Health Service in the 1950s to understand why people do not participate in disease prevention programs or early detection screenings[2]. As Wang *et al*[1] investigated, HBM includes several sub-factors: (1) Perceived susceptibility; (2) Perceived severity; (3) Perceived benefits; (4) Perceived barriers; and (5) Self-efficacy. Perceived susceptibility is the degree to which one feels at risk of a disease, and perceived severity is the perceived seriousness of contracting or leaving a disease untreated. Perceived benefits refer to the perceived advantages of a specific health behavior, and perceived barriers are the perceived obstacles to performing a health behavior. Self-efficacy is the individual's belief in their ability to produce a specific outcome[2]. In short, the HBM posits that cognition plays a crucial role in decision-making, triggering expectations about the outcomes of certain behaviors. People are more likely to engage in health behaviors when they believe they are at high risk for a health issue, the health issue will have severe consequences, the behavior will reduce the risk or severity, the benefits outweigh the barriers, and they have internal or external cues and confidence to perform the behavior. In this context, motivational interviewing, personalized education plans, and digital health tools for reminders and encouragement may be effective strategies for enhancing patient engagement and adherence. Wang *et al*[1] implemented health education based on these principles, resulting in successful outcomes.

The implications of the study by Wang *et al*[1] highlight the significance of structured health education in clinical practice. By utilizing the HBM framework, the study effectively demonstrates how targeted interventions can lead to measurable improvements in health outcomes. For instance, the observed reductions in systolic and diastolic blood pressures among the intervention group underscore the potential for HBM-based education to mitigate cardiovascular risks in hypertensive patients. This finding is particularly relevant in the context of managing chronic conditions, where patient adherence to prescribed health behaviors is critical for long-term disease management. Moreover, the study's approach to reducing perceived barriers while enhancing self-efficacy and perceived benefits is noteworthy. These elements are central to the HBM and play a pivotal role in influencing health behaviors. The intervention's success in these areas suggests that health educators should prioritize these factors when designing educational programs. By addressing patients' perceived barriers and boosting their confidence in managing their health, educators can foster a more proactive approach to disease prevention and management.

Randomized clinical trials using HBM-based interventions have been conducted not only for chronic diseases, cancer screenings, and infectious disease screenings but also to induce lifestyle changes or improve medication adherence in those with diseases. For example, in diabetic patients, the intervention group that received HBM-based education showed significant improvements in metabolic and glycemic profiles compared to the control group[3]. HBM-based education has been demonstrably effective in promoting cancer screenings, including those for colorectal[4], breast[5], oral[6], and cervical cancer[7]. Similarly, it has been utilized for infectious disease prevention education, such as infant screening in human immunodeficiency virus-infected pregnant women[8] or tuberculosis screening[9]. Additionally, it has shown promise in inducing lifestyle changes in patients with non-alcoholic fatty liver disease[10] and hypertension[11]. Furthermore, HBM-based education has been beneficial for improving medication adherence in stroke survivors[12] and tuberculosis patients[13]. It has also proven valuable in preventive approaches, such as secondhand smoke prevention education for pregnant women[14] and human papillomavirus vaccination promotion[15].

The versatility of the HBM in diverse health contexts highlights its broad applicability. However, it is essential to acknowledge the model's limitations to enhance its effectiveness further. Since the HBM was developed in the 1950s within the limited cultural context of the United States, there are concerns about its applicability across different races, societies, and cultures, given the potential differences in beliefs and values. It has also been shown to be less effective for behaviors requiring long-term change influenced by emotional and motivational factors, such as those related to mental health. Moreover, complex health behaviors like smoking or obesity, influenced by environmental, social, and economic factors, may not be adequately addressed by the HBM's focus on individual perceptions and beliefs. Additionally, by placing responsibility on individual perceptions and actions, the HBM may inadvertently promote a culture of blame or stigmatization, negatively impacting individuals. Despite these limitations, appropriate HBM-based educational interventions, as demonstrated by Wang *et al*[1], can positively impact patient outcomes in most clinical situations. This reinforces the model's potential when appropriately adapted and implemented, highlighting its value in health education and promotion. Effective application of HBM to diverse populations requires culturally sensitive education, tailored health messages, trust-building with local leaders, culturally relevant practices, and collaboration with local healthcare providers.

Future research should focus on integrating the HBM with other behavioral theories to address its limitations. For instance, combining the HBM with models emphasizing social and environmental health determinants could provide a more comprehensive framework for designing interventions. While integrating these models is a well-established practice in behavioral science, how they are combined and applied offers potential for new applications. One example is the integration of the HBM with the theory of planned behavior (TPB)[16] and social cognitive theory (SCT)[17]. HBM addresses perceived barriers and benefits, TPB focuses on behavioral intentions, and SCT builds self-efficacy. Thus, the proposed framework would use HBM to address beliefs about health risks and SCT to develop skills and confidence to adopt healthy behaviors. This combined approach could further enhance the effectiveness of health education interventions in clinical settings.

Additionally, the socio-ecological model[18], which considers community, social, and economic factors, may more effectively address the social determinants of health in managing chronic diseases such as hypertension. Furthermore, longitudinal studies are needed to assess the long-term impact of HBM-based education on health behaviors and outcomes, such as behavior change, medication adherence, and blood pressure control. To maintain participant motivation, researchers may implement strategies such as follow-up reminders, real-time data updates, and micro-rewards. Emerging technologies, including wearable devices, virtual reality, artificial intelligence, and online support groups, could provide feedback and foster engagement throughout the study duration. By expanding the evidence base and refining the model, researchers can develop more effective strategies to promote health and prevent disease across diverse populations.

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## CONCLUSION

The study by Wang *et al*[1] illustrates the practical application of the HBM in improving health outcomes through structured education. While the HBM has limitations, its core principles offer valuable insights into designing effective health interventions. By addressing perceived barriers, enhancing self-efficacy, and highlighting the benefits of health behaviors, educators can motivate patients to adopt and maintain healthier lifestyles. As healthcare continues to evolve, integrating the HBM with other theoretical models and adapting it to various cultural contexts will be crucial for advancing public health and improving patient care.

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## FOOTNOTES

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