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Comparative Analysis of Behavioral Theories in Promoting CPR: A Theory-Based Approach to Cardiopulmonary Resuscitation Training in Community

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Abstract: Sudden cardiac arrest (SCA) is a critical emergency that need immediate intervention to prevent death. This review will discuss behavioral theories relevant to the promotion of Cardiopulmonary Resuscitation in the community. Findings from previous studies were analyzed using approaches from three theories, namely the Integrated Behavior Model (IBM), Health Belief Model (HBM), and Social Cognitive Theory (SCT). This narrative review examines three behaviour theories applicability as a conceptual model for CPR promotion, focusing on enhancing community engagement and response rates to out-of-hospital cardiac arrests (OHCA). Articles search keywords used for review including "CPR Intention Factors," "Willingness to Perform CPR," "Predictors of CPR Intention," and "Social Determinants of CPR.". Database used were ProQuest, ScienceDirect, and Sage Journals. Eleven articles were utilized, revealing findings that experience, skills, demographic factors, culture, training, attitudes, norms, and knowledge contribute to community CPR actions. Findings suggest that IBM can effectively support CPR promotion strategies, fostering a culture of preparedness and resilience against cardiac emergencies.

Keywords: Behavior theories; Cardiopulmonary resuscitation; CPR Promotion

Introduction

Sudden Cardiac Arrest (SCA) is the abrupt cessation of heart function, occurring in individuals with or without a history of heart disease (Panchal et al., 2020). This condition is a critical emergency, as it stops the supply of oxygen and nutrients from the blood to the entire body. If not treated quickly and properly, it results in hypoxia and subsequent organ failure.

Data from the Pan Asian Resuscitation Outcome Study (PAROS) shows that over three years, there were 60,000 out-of-hospital cardiac arrest (OHCA) incidents in the Asia-Pacific region, including Indonesia (Hock et al., 2014; Ong et al., 2015). Survival rates for out-of-hospital cardiac arrest (OHCA) vary widely worldwide and remain low overall.

Southeast Asia reports similarly, with data from the Australian Aus-ROC Epistry showing rates below 8%, and fewer than 3% of patients achieving good neurological outcomes (Gräsner et al., 2021). In Indonesia, in 2023, the death rate due to heart disease was in second place after stroke, with a percentage of

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14.38 % (12.9% in 2018) of the total causes of death. Basic Health (Kemenkes, 2023).

The community plays a vital role in improving cardiac arrest survival rates. Data from Singapore (2011–2020) shows a significant rise in bystander CPR, increasing from 22% in 2011 to 60% in 2017. This coincided with a rise in survival, from 48 survivors in 2011 to 200 in 2019. Although survival declined in 2020, it remained higher than in earlier years (Lim et al., 2022).

Theory-based interventions are essential for promoting CPR as they enhance bystanders' knowledge, skills, and performance during cardiac emergencies. The use of theoretical frameworks can significantly improve training programs by focusing on factors which influence intentions and behaviours (Ilmiyah et al., 2022). For instance, intention-focused approaches have been shown to improve bystander CPR performance (Panchal et al., 2015).

Theory-based interventions are crucial for promoting CPR as they enhance understanding of the psychological and behavioral factors that influence bystander response. Structured promotion programs based on these theories can also boost CPR knowledge and skills, increasing participants' confidence and readiness to act (Upendrababu & Kunjumon, 2018).

Methods

This study employs a narrative review approach, drawing upon high-quality peer-reviewed journals and reputable academic textbooks to explore the determinants of community intention to perform cardiopulmonary resuscitation (CPR). The review process was conducted in two sequential phases. The first phase focused on identifying a broad range of factors that influence individuals' willingness to perform CPR in emergency situations, including psychosocial, environmental, and demographic determinants. This step also aimed to map the consistency of findings across various contexts and populations. The second phase examined the theoretical frameworks most frequently used to explain CPR intention, namely the Health Belief Model (HBM), Social Cognitive Theory (SCT), and the Integrated Behavior Model (IBM) (Beyera et al., 2022). These frameworks were selected because they offer comprehensive constructs—such as perceived benefits, perceived barriers, self-efficacy, social norms, and behavioral intentions—that are essential for understanding CPR decision-making processes (Reid & Aiken, 2011).

The literature search was systematically conducted using three major academic databases: ProQuest, ScienceDirect, and Sage Journals. These platforms were chosen due to their extensive coverage of health sciences, behavioral studies, and public health research. A combination of specific keywords and Boolean operators was applied, including "CPR Intention Factors," "Willingness to Perform CPR," "Predictors of CPR Intention," and "Social Determinants of CPR." The search was limited to studies published between 2017 and 2024 to ensure the inclusion of recent and relevant evidence. Only articles written in English and available in full text were reviewed to maintain consistency and accessibility (Liu et al., 2024).

To ensure focus and methodological rigor, several exclusion criteria were applied. Studies were excluded if they examined CPR in hospital-based cardiac arrest, heart attacks, or COVID-19–related cardiac events. Research involving CPR performed by medical personnel, including nurses, physicians, and medical students, was omitted to maintain a community-based perspective (Robertson et al., 2014). Articles discussing CPR in the context of trauma, extracorporeal membrane oxygenation (ECMO), or pandemic-specific protocols were also excluded. Additionally, case studies and case reports were not considered, as they do not provide generalizable insights for community CPR intention.

Result and Discussion

The articles were excluded for the following reasons: they focused on studies involving AED use, where the outcomes were knowledge and skills; addressed first aid rather than CPR; centred on providing emotional support to patients and families; examined different CPR training methods; focused on outcomes related to high-quality CPR performance; discussed the challenges of performing CPR in public settings; or were primarily evaluations of CPR training programs.

The Health Belief Model (HBM) is a psychological framework used to predict health-related behaviours by focusing on individual attitudes and beliefs. It suggests that individuals are more likely to perform cardiopulmonary resuscitation (CPR) if they perceive a serious threat from cardiac arrest, believe CPR will reduce the threat, and feel confident in their ability to perform it. Key HBM constructs including; perceived susceptibility, severity, benefits, barriers, and self-efficacy influence CPR intention.

The constructs of the Health Belief Model (HBM) that align with previous research findings include perceived severity, perceived barriers, and self-efficacy. The role of perceived severity is evidenced by the studies of Al-Riyami et al. (2020); Huang et al. (2019). The influence of perceived barriers is highlighted in the research by Munot et al. (2023). The role of self-efficacy

is demonstrated in the studies by Jaskiewicz et al. (2022); Villalobos et al. (2019).

Al-Riyami et al. (2020) found that recognizing the seriousness of cardiac arrest, referring to the concept perceived severity, increased CPR intention. Similarly, in Taiwan, individuals with CPR skills naturally possess a heightened sense of urgency in life-saving situations and are more likely to perform bystander CP. Perceived barriers, such as fear of causing harm or legal consequences, also deter individuals from intervening. A study by Munot et al. (2022) in Australia noted that cultural and social fears, including liability concerns, reduced CPR attempts, even when prior training had occurred.

Lastly, self-efficacy, or confidence in CPR skills, plays a crucial role. Research has shown that individuals with greater self-confidence are more likely to act in emergencies (Jaskiewicz et al., 2022). Training programs that boost self-efficacy enhance willingness to perform CPR by providing the necessary skills and confidence (Villalobos et al., 2019). Addressing these HBM constructs through education and training can improve public readiness to respond to cardiac emergencies and increase survival rates.

Based on results, factors like social and cultural environments, personal experiences and prior education, demographic factors like age and gender, and policy and accessibility influencing an individual's intention to perform cardiopulmonary resuscitation (CPR) but not addressed by the Health Belief Model (HBM). While HBM focuses on risk perception, benefits, and barriers, external and social factors also play critical roles.

One key factor is the influence of social and cultural environments. Research shows that social norms and community support can enhance willingness to perform CPR. For instance, community-based training programs that encourage social interactions improve participation in CPR training and willingness to act in emergencies (Moon et al., 2019).

Personal experience and prior education, not covered by HBM, also significantly influence CPR intentions. Studies by Al-Riyami et al. (2020); Munot et al. (2022); Villalobos et al. (2019), show that individuals with prior CPR training are more likely to act in emergencies. In Oman, 47% of those who declined to perform CPR cited a lack of knowledge as the main reason, highlighting the importance of education in boosting confidence. Similarly, individuals with previous emergency experience are more likely to intervene.

Demographic factors like age and gender also affect CPR intentions. Younger individuals are more likely to perform CPR than older individuals, partly due to differences in training (Charlton et al., 2022). Finally, policy and accessibility factors play vital roles. Accessible, affordable CPR training programs increase public participation and readiness to act.

Social Cognitive Theory (SCT**)** emphasizes the role of observational learning, imitation, and modelling in behaviour acquisition, highlighting the interaction between personal factors, environmental influences, and behaviour. In the context of cardiopulmonary resuscitation (CPR), SCT offers insights into factors influencing the intention to act during emergencies.

Based on findings from previous research, the constructs of Social Cognitive Theory (SCT), including self-efficacy, observational learning, and social environment, play a crucial role in enhancing CPR intention within the community. Self - efficacy like in Moon et al. (2019) finding show that individuals who received CPR training reported increased confidence in their ability to perform the procedure, positively influencing their willingness to act. Similarly, training programs have been shown to enhance self-efficacy among laypersons, leading to increased rates of bystander CPR (Villalobos et al., 2019).

Observational learning also plays a crucial role in shaping CPR intentions. Witnessing others successfully perform CPR or engage in training fosters a positive attitude toward acting in emergencies. Community-based training programs using real-life scenarios improve knowledge and cultivate a culture of preparedness (Munot et al., 2022). However, it is essential to recognize that knowledge alone does not guarantee the translation of positive attitudes into practice. Factors such as motivation, perceived urgency of other tasks, and personal beliefs can interfere with the implementation of behaviour, despite a positive attitude (Aldawsari et al., 2023). Educational settings, where students learn CPR through demonstrations and practice, similarly increase the likelihood of intervention in real situations (Qian et al., 2021). Structured health education can also enhance an individual's knowledge, attitudes, and behaviours (Lutfiasari et al., 2024).

The social environment, including peer influence and community norms, significantly affects CPR intentions. Previous research suggests individuals are more likely to act if they perceive their peers value CPR. However, cultural and social barriers, such as fear of causing harm, can deter CPR attempts despite prior training (Munot et al., 2022). Tailored educational interventions that address these barriers, particularly in schools and communities, can enhance CPR readiness and community resilience (Al-Riyami et al., 2020; Almutairi et al., 2023).

While SCT focuses on personal, environmental, and behavioural factors, broader social and cultural

influences also play a significant role, and these are not addressed by Social Cognitive Theory (SCT). For instance, social norms and cultural identity can impact CPR willingness. A UK study found that while socioeconomic status did not directly affect CPR willingness, cultural identity and social cohesion significantly influenced action in emergencies (Charlton et al., 2022). This suggests that individuals in communities with strong social bonds may be more motivated to perform CPR, regardless of education or training.

Another important factor not fully addressed by SCT are the role of direct emergency experience, policy and accessibility, and demographic variables. Research shows that individuals who have witnessed or been involved in emergencies are more likely to respond in future situations. For example, a study in Oman found that people with prior emergency experience were more willing to perform CPR, even without formal training (Al-Riyami et al., 2020). Accessible and affordable community-level training programs can also increase public preparedness. Studies demonstrate that such programs significantly boost CPR awareness and participation during emergencies (Villalobos et al., 2019). Additionally, younger individuals tend to be more willing to perform CPR, possibly due to greater exposure and training, while gender differences in confidence levels may also influence CPR decisions (Almutairi et al., 2023; Krammel et al., 2018).

The Integrated behaviour Model (IBM) integrates various behavioural theories to predict individual intentions and actions. Key constructs of IBM include; behavioural beliefs, subjective norms, and perceived behavioural control. Behavioural beliefs encompass perceptions of CPR's benefits and risks. Research shows that individuals who recognize CPR's life-saving potential are more willing to act. In Oman, 47% of respondents cited a lack of basic life support (BLS) knowledge as a barrier to performing CPR (Al-Riyami et al., 2020). Enhancing awareness of CPR's benefits could increase the intention to act.

Subjective norms, involving social influences, are also crucial. Studies reveal that individuals are more likely to perform CPR when they believe their peers, family, or colleagues support the action. A Taiwanese study found a significant increase in CPR willingness among those with necessary skills and social support (Huang et al., 2019). Fostering positive social norms can boost community participation in CPR.

Perceived behavioural control, or confidence in one's CPR abilities, is another key factor. Individuals with higher confidence are more likely to act in emergencies. A study in Australia showed that proper training enhances confidence and readiness to perform CPR, increasing the intention to act (Munot et al., 2023). This underscores the importance of effective training programs in improving perceived control and CPR intentions.

While IBM covers these aspects, practical experience also plays critical roles, and this not fully captured by IBM. According to Al-Riyami et al. (2020) direct emergency experience or prior CPR training increases the likelihood of action. Thus, practical experience and targeted training can enhance CPR readiness, even if not explicitly addressed by IBM's constructs.

Integrated Behaviour Model (IBM) for Promoting CPR in Community

The Integrated Behaviour Model (IBM) presents a compelling framework for enhancing community intentions to perform cardiopulmonary resuscitation (CPR) compared to the Health Belief Model (HBM) and Social Cognitive Theory (SCT). This assertion is grounded in the model's comprehensive approach to understanding the multifaceted nature of human behavior, particularly in the context of health-related actions such as CPR. The IBM integrates various psychological constructs that influence behavior, including attitudes, perceived norms, and self-efficacy, which are crucial for fostering the intention to act in emergency situations like cardiac arrest.

One of the primary strengths of the IBM is its emphasis on the role of social norms and expectations in shaping individual intentions. Research indicates that normative beliefs, which are derived from the Theory of Planned Behaviour (TPB), significantly correlate with individuals' intentions to perform CPR. For instance, found that individuals are more likely to initiate CPR if they believe their friends and family expect them to do so, highlighting the importance of social influence in behavioural intentions (Farquharson et al., 2023). This aspect of the IBM allows for targeted interventions that can leverage community expectations to enhance CPR training and participation rates.

In contrast, the HBM primarily focuses on individual perceptions of health risks and benefits, which may not adequately account for the social dynamics that influence behaviour. While the HBM posits that individuals will engage in health-promoting behaviours if they perceive a significant threat to their health and believe that taking a specific action would reduce that threat, it often overlooks the impact of social context and peer influence. This limitation can hinder the effectiveness of interventions aimed at increasing CPR intentions, as individuals may not feel compelled to act without the reinforcement of social norms.

Moreover, the SCT emphasizes the role of observational learning and reinforcement in behaviour change. While this model recognizes the importance of social influences, it tends to focus more on individual learning experiences rather than the collective social environment that the IBM addresses. The IBM's integration of cognitive, emotional, and social factors provides a more holistic understanding of the motivations behind CPR intentions. For example, highlighted that awareness and knowledge, along with social influences, are critical in shaping health behaviours, including CPR (Kannan et al., 2019). This suggests that a model like the IBM, which encompasses these elements, is better suited for practical applications in community settings.

The IBM also incorporates the concept of self-efficacy, which is essential for empowering individuals to take action in emergency situations. Self-efficacy refers to an individual's belief in their ability to perform a specific behavior, which is particularly relevant in the context of CPR. Studies have shown that increased self-efficacy correlates with a higher likelihood of performing CPR when needed (Jaskiewicz et al., 2022). The IBM's focus on enhancing self-efficacy through training and education can lead to more significant increases in community members' willingness to engage in CPR, as opposed to models that do not emphasize this construct as strongly.

Furthermore, the IBM's comprehensive nature allows it to address environmental and contextual factors that may facilitate or hinder CPR performance. For instance, community-based training initiatives that incorporate the IBM have been shown to improve bystander CPR rates significantly (Munot et al., 2022). This is in stark contrast to the HBM and SCT, which may not fully account for the environmental barriers that individuals face when considering whether to perform CPR. By recognizing these contextual elements, the IBM can inform more effective training programs that prepare individuals to act decisively in emergencies.

In practical applications, the IBM has demonstrated its utility in various health promotion contexts, including CPR training. For example, emphasized that community education initiatives grounded in the IBM framework can significantly enhance bystander response rates in cardiac arrest situations (Munot et al., 2022). This evidence supports the notion that the IBM is not only theoretically robust but also practically effective in increasing community intentions to perform CPR.

The integration of multiple behavioural theories within the IBM also allows for a more nuanced understanding of the factors influencing CPR intentions. By synthesizing elements from the TPB, SCT, and other models, the IBM provides a comprehensive framework that can be tailored to specific community needs and contexts. This adaptability is crucial for designing interventions that resonate with diverse populations and address their unique barriers to performing CPR.

Additionally, the IBM's focus on intention as a key determinant of behaviour aligns with findings from various studies that underscore the importance of intention in predicting actual CPR performance. For instance, articulated an "Intention-Focused" paradigm that highlights the significance of intention in driving bystander CPR rates (Panchal et al., 2015). This focus on intention is a critical component that sets the IBM apart from the HBM and SCT, which may not emphasize this aspect as strongly. Moreover, the IBM's ability to incorporate feedback mechanisms allows for continuous improvement of interventions aimed at increasing CPR intentions. By assessing the effectiveness of various strategies and adapting them based on community feedback, the IBM can facilitate a dynamic approach to health promotion that evolves with the community's needs. This adaptability is essential in addressing the changing landscape of public health challenges, particularly in emergency response scenarios.

Conclusion

Based on the reviewed evidence, the Integrated Behavior Model (IBM) emerges as the most comprehensive and suitable framework for understanding and enhancing community intention to perform cardiopulmonary resuscitation (CPR). Although the Health Belief Model (HBM) and Social Cognitive Theory (SCT) each contribute valuable insights, their scope is more limited compared to the multidimensional structure offered by the IBM. The HBM effectively explains how perceived severity, perceived barriers, and self-efficacy shape CPR intention. Studies consistently show that individuals are more likely to act when they recognize the life-threatening nature of cardiac arrest, believe CPR is beneficial, and feel confident in their skills. However, HBM does not adequately address environmental, cultural, and social variables—factors repeatedly shown to influence willingness to act, such as community norms, cultural fears, and access to training. SCT strengthens this understanding by incorporating observational learning, modeling, and social influence. It explains how witnessing CPR or learning through demonstrations increases confidence and willingness. Nevertheless, SCT also falls short in fully integrating broader structural determinants such as policy, accessibility, demographics, and community-wide norms that extend beyond personal and interpersonal factors. In contrast, the IBM integrates components from

both models while expanding them. IBM accounts for attitudes, perceived norms, self-efficacy, and perceived behavioral control, while also acknowledging the importance of skills, environmental constraints, and direct experience. Evidence shows that subjective norms—beliefs about what important others expect—significantly shape CPR intention, especially in cultures where communal expectations guide behavior. IBM also captures the essential role of practical experience and training, which strongly predict actual CPR action but are only indirectly addressed by HBM and SCT.

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The authors declare no conflict of interest.

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