



Health Behaviors and Patients with Coronary Artery Disease (CAD) : Role of Self-efficacy

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Article info

Article history:

Received : 8 November 2020

Revised : 24 April 2021

Accepted : 25 May 2021

Keywords:

Coronary artery disease, Health behavior, Self-efficacy

Abstract

Cardiac disease is a major risk of mortality and morbidity globally. Patient with Coronary artery diseases are more likely than other chronic disease in poor health behavior either pre-treatment or post-treatment. Even though cardiac patients tried to seek the ways to promote their health, they might face with the difficulties to change the behavior. Numerous studies showed that self-efficacy plays a crucial role as a buffer to perform activity as reflect personal beliefs and confidence. We synthesize the evidences on self-efficacy and health behavior regarding smoking behavior, alcohol consumption, eating behavior, physical activity or exercise behavior and stress management. We found that most of the researchers successfully applied self-efficacy to promote physical activity or exercise among patients with coronary artery disease in short term period. Nurses should assess functional status and provide health education to promote well-being and encourage patients to perform and maintain their capability on health-promoting behaviors.

Introduction

Coronary artery disease (CAD) is a major health problem as the most common underlying cause of morbidity in the world (Chiou et al., 2009; Mosleh & Darawad, 2015). In 2013, CAD was the underlying cause of death of an estimated 17.3 million from 54 million total deaths (Benjamin et al., 2017). Globally, it is estimated that the mortality rate of CAD will increase by 34% by 2030 (Imes et al., 2016). The prevalence of CAD is 36% of the US population (Kang & Yang, 2013). In Thailand, the statistics from World Health Organization showed that cardiovascular disease are the first ranked across non-communicable diseases affecting 23% of Thai people (WHO, 2018). CAD affects life expectancy, cost of hospitality, and quality of life (Benjamin et al., 2017).

Consequently, CAD have been studied across the global in which related to the various of behavioral risk factors including smoking, obesity, physical inactivity, alcohol consumption, and unhealthy diet (Benjamin et al., 2017; WHO, 2018). Moreover, CAD with poor prognosis was typically found among patients who had these behavioral risk factors. WHO has mentioned the effectiveness of health promotion to enhance physical and psychological well-being for people suffering with CAD (WHO, 2018). Nevertheless, it is challenging among CAD patients to maintain healthy lifestyle modification.

CAD patients characteristics and health promotion

CAD typically presents in several symptoms such as dyspnea, angina and fatigue which is dependent on

the degrees of stenosis, the consequences of the vessel stenosis, plaque characteristics, and the level of myocardial ischemia (Bauersachs et al., 2019). These symptoms can develop into heart failure, hospitalization, disability, and reduced activities of daily living among CAD patients. The improvements of medical technologies and treatments have resulted in an increase life expectancy (Tinkham, 2014). However, CAD patients typically have comorbidities (Benjamin et al., 2017). Health promotion behavior is important, particularly related to maintaining physical function and quality of life (Lee et al., 2006). In fact, health promotion aims to enhance dignity, value, and life satisfaction (Tinkham, 2014). Health promotion efforts tended to focus on single behavior and condition-specific in order to facilitate health behavior change (Ryan, 2009). Patients with well-designed disease management plans the effective ways to promote behavioral health (Huynh-Hohnbaum et al., 2015). Nevertheless, patients with CAD are largely ignorant of health behavior and lack understanding the lifestyle modification (Chiou et al., 2009)

Self-efficacy: Concept and application for health behavior and chronic diseases

One of the concepts that described for health behavior change is self-efficacy. Self-efficacy is a psychosocial concept that expresses person's capability and confidence for behavior change and maintains healthy behavior. As a central concept of social cognitive theory, self-efficacy refers to individuals believing in their capacity to perform a specific behavior (Bandura, 1997; Grembowski et al., 1993). Bandura (1997) stated that Self-efficacy refers to the confidence in one's ability to behave in such a way as to produce a desirable outcome. Self-efficacy is an important concept because it is related to behavioral changes among individuals (Zullkosky, 2009). Perceived self-efficacy is defined as the individual's confidence to perform a behavior to reach certain expected outcomes (Bandura, 1997; Purdie & McCrindle, 2002). Gonzalo (2019) also noted that perceived self-efficacy refers to the personal capability to organize healthpromoting behavior. Perceived self-efficacy influences perceived barriers to action. Thus, a higher efficacy mediates to lowered perceptions of barriers to the healthy behavior.

Researchers have focused on self-efficacy in applying to affect certain behaviors and maintain positive

outcomes (Bandura, 1997). On the one hand, focusing on self-efficacy and outcome expectation is crucial to design an effective intervention to change poor healthy behavior (Zullkosky, 2009).

Health behavior has been examined in an intervention following the theoretical model (Zanjani et al., 2006). To promote health behavior and disease management, the researchers have been integrated perceive self-efficacy as a buffer role to modify or maintain health behavioral among patients with chronic diseases (Clark & Dodge, 1999). For instance, self-efficacy has been shown to predict the individuals' confidence that relates to engaging in exercise, increasing healthy eating, and managing the symptoms (Ahn et al., 2016; Hajizadeh-Sharafabad & Alizadeh, 2016; French, 2013).

The relationship of self-efficacy on predicting health behaviors

Self-efficacy is a successful achievement of action plan (Huynh-Hohnbaum et al., 2015). A high level of self-efficacy is associated to compliance with healthy behaviors such as medication adherence, healthy diet, and regular exercise (Kang et al., 2010). Self-efficacy has been shown to decrease the rate of symptom recurrence and readmission and improve quality of life (Kang et al., 2010). Level of self-efficacy are determined for heart failure (HF) patients (Zullkosky, 2009). A low sense of self-efficacy among HF patients typically struggled with complex daily living tasks, such as sodium and water restrictions, daily weights, and proper medication administration (Zullkosky, 2009). Therefore, self-efficacy plays an important factor to predict health behavior.

The self-efficacy intervention and gap for health behavior among CAD patients

Several pieces of evidence support the idea that self-related cognition has an influence on motivation process for lifestyle modification and behavior changes among CAD patients (Banman & Sawatzky, 2017; Clark & Dodge, 1999; Grembowski et al., 1993; Kang et al., 2010). Despite the known benefits of adhering to a heart-healthy lifestyle, fewer women than men participate in prevention strategies (Banman & Sawatzky, 2017). Perceived self-efficacy as well as individual factors might be an important factor influencing individually health behaviors among CAD patients (Kang et al., 2010). Health behaviors of CAD patients and how a self-efficacy

intervention plays a crucial role to promote healthy behavior that will be discussed in this paper.

The role of self-efficacy in changing health behavior

Self-efficacy has well recognized as a beneficial effect on health behavior and health status in patients with chronic diseases (Bandura, 1997). Self-efficacy would be viewed as part of a reciprocal behavioral process (Clark & Dodge, 1999). Self-efficacy could be a predictor of specific health behaviors as well as an outcome of disease management behaviors (Clark & Dodge, 1999). Perceived self-efficacy expressed the interaction of personal, behavioral, and environmental factors that produce behavior (Clark & Dodge, 1999). Health behavior and disease management showed how self-efficacy fits into the behavioral changing process (Grembowski et al., 1993). Nevertheless, it is not clear about the summary of the effectiveness of self-efficacy for CAD health behaviors.

The level of self-efficacy and CAD health behavior

High self-efficacy for a specific health behavior allows individuals to address better without uncertainty, anxious situation, and conflict (Bandura, 1997). Exploring the specific CAD patients and their behaviors may be an important determinant to illustrate cardiac self-efficacy and intervention (Sarkar et al., 2007). For instance, dietary self-efficacy, physical activity self-efficacy, and cessation of smoking self-efficacy are the major health deviation that will be discussed how self-efficacy plays a large role in improving health behavioral change (Sol et al., 2011).

The Purpose statement

The purpose of this review is to synthesize the self-efficacy intervention strategies on health behaviors among patients with CAD regarding smoking cessation, alcohol consumption, diet /eating behavior, physical activity/exercise behavior, and stress management. We narratively synthesize the evidence indicating a relationship between self-efficacy interventions and CAD health behaviors. The findings of this scoping review may help nurses and health care providers to understand the relationship between self-efficacy and health behaviors of CAD patients.

Self-efficacy intervention on smoking cessation and addictive behavior

1. The relationship between Smoking and CAD

Cigarette smoking has been identified as a risk factor for cardiovascular disease (Sol et al., 2011; Park et al., 2015). Almost 30% of CAD patients-related deaths were smokers (Eisenberg et al., 2010). The previous studies have shown that smoking cessation can reduce the risk of heart attack and peripheral vascular disease (PAD) by one-third after 2 years (Eisenberg et al., 2010; de Hoog et al., 2016; Johnson et al., 1999).

1.1 Self-efficacy and smoking behavior

Social cognitive have been intervened to promote successful smoking cessation in general population, as well as among CAD patients (Eisenberg et al., 2010; de Hoog et al., 2016). Thus, self-efficacy in the area of smoking cessation has been widely studied. Making action and coping plans in CAD patients are the most strategies for smoking cessation (de Hoog et al., 2016). The effects of self-efficacy involved on motivating patients to quit smoking as well as predicted intention to quit smoking (de Hoog et al., 2016). For quitting smoking, self-efficacy had a significant effect on continued abstinence which was mediated by intention (de Hoog et al., 2016). Thus, the potentials factors for changing behavior among CAD smokers focused on positive attitudes, social influence belief, and self-efficacy as a result of a positive attention.

1.2 Smoking cessation intervention strategies

The smoking cessation intervention has shown the benefit for CAD patients after percutaneous coronary intervention. Post-treatment self-efficacy intervention was significantly changed for smoking behavior and increased non-smoking status among CAD patients for 6 and 12 months (Park et al., 2015). Self-efficacy strategies for smoking cessation included counseling such as brief advice, short message via telephone, and self-help materials (Park et al., 2015), and telephone support (Johnson et al., 1999). To increase actual behavior change and self-efficacy to quit smoking, physicians and nurses used verbal advice for CAD patients as a strategy (Eisenberg et al., 2010; de Hoog et al., 2016; Johnson et al., 1999). Eisenberg et al. (2010) claimed that the duration of smoking cessation intervention is varying between 20 minutes to 12 months. These results indicate that perceived self-efficacy for smoking cessation predicts short and long-term smoking cessation.

2. Alcohol and CAD

Mild to moderate amount of alcohol consumption is related to the lower risk of CAD (Emberson & Bennett, 2006). However, the type of alcohol consumed and drinking pattern may have contributing effects as a high risk of CAD (Badnardi et al., 2008). Heavy drinking behavior is not recommended as a higher risk for development of CAD (Bagnardi et al., 2008; Emberson & Bennett, 2006). Bagnardi et al. (2008) explained that irregular drinking will affect physiological response in reducing the threshold for arrhythmia and myocardial function.

For drinking behavior, self-efficacy strategies focused on drinking behavior coping strategies. Avoidant coping strategies are related to increased alcohol consumption (Hasking & Oei, 2004). Avoidant coping predicted alcohol consumption for those who had strong positive expectancies on drinking behavior (Hasking & Oei, 2004). Expectancies and refusal self-efficacy are related to the initiation and maintenance of drinking behavior (Oei & Burrow, 2000). In fact, positive and negative expectancies influence alcohol consumption. For example, individuals expected positive outcomes from drinking behavior, their alcohol consumption will increase. Holloway et al. (2007) used brief intervention (BI) in reducing alcohol consumption among drinkers in hospital. The result revealed that self-efficacy enhancement intervention reduced alcohol consumption after 6 months. It was consistent with Bartholet et al. (2009) alcohol consumption relates to cognitive dimensions of behavior change. Patients with unhealthy alcohol consumption reported a significant increase in readiness to change, importance of changing and confidence in an ability to change after completing 6 months of self-efficacy program.

In summary, the self-efficacy intervention strategies for smoking cessation have been notable while the strategies for reducing alcohol consumption are not specific in CAD patients. However, the results of this paper showed that self-efficacy intervention for changing addictive behaviors relates to the problem-solving and reinforcing patients' self-efficacy

Self-efficacy intervention and diet or eating behavior

Eating behavior is a crucial part of cardiovascular lifestyles. Poor diet quality is a risk for patients before and after cardiac events (Ma et al., 2010). For CAD patients, eating behavior affects body weight, lipid

profile, blood glucose, blood pressure (Guertin et al., 2015). The recommendation for meal plan from American Heart Association includes a low-fat diet, low-carbohydrate diet, high protein diet, and low sodium diet (Ma et al., 2010). Even CAD patients should adopt the healthier eating behavior, regulation of their eating behavior is needed in order to persist and maintain well-being and health status in CAD patients (Guertin et al., 2015; Sarkar et al., 2007).

Self-efficacy and eating behavior have been studied in healthy and unhealthy people (Guertin et al., 2015). Self-efficacy can positively influence with eating habit (Kang & Yang, 2013). Researchers applied self-efficacy concept to enhance CAD patients' confidence to modify their eating habit (Kang & Yang, 2013; Ma et al., 2010). Kang and Yang (2013) claimed that self-efficacy intervention strategies typically focused on secondary prevention as same as smoking cessation. Weight control is an example to measure how self-efficacy plays a significant role to promote eating behavior (Guertin et al., 2015). The effects of experience of receiving education, awareness of risk factors and disease knowledge increase cardiac self-efficacy and related to decrease a body mass index (Kang & Yang, 2013). Body weight is an expected outcome of eating behavior. In fact, patients' confidence in reaching their optimal goal weight, confidence in consuming a low fat diet as well as low cholesterol diet, and confidence in their ability to lose weight (Chiou et al., 2009). It is indicated that effect of self-efficacy will be moderated by outcome expectancy.

Self-efficacy intervention and physical activity/exercise behavior

Physical activity/exercise is recognized as an important behavior in patients with CAD as part of cardiac rehabilitation (CR) (Barkley & Fahrenwald, 2013). CR programs are effective in improving the functional abilities of CAD patients who maintained adherence to regular exercise (D' Angelo et al., 2014). However, being physically active in daily life among CAD patients appears to be increasingly difficult (Warner et al., 2014). Only 50% of CR participants continue to engage exercise for 3-6 months and few meet recommended level of exercise for 12 months (D' Angelo et al., 2014). The barriers of exercise among CAD patients are beyond the type of physical activity, the duration of intervention, heart condition, fear of falling

and self-efficacy belief (Gary, 2006; Warner et al., 2014). People can have a different level of self-efficacy in specific behavior and tasks (Warner et al., 2014; Rodgers et al., 2002). Thus, CAD patients need an effective intervention to increase their confidence to produce certain action (French, 2013).

Self-efficacy plays a significant role in the adoption of adherence in exercise-related activities in CAD patients (Gary, 2006). The causal role of self-efficacy in changing health behavior is tested. French (2013) claimed that self-efficacy is purported to be both cause and an effect of performing physical activity. Self-efficacy intervention for physical activity and exercise included behavioral intervention. Alsaleh et al. (2016) found that 6-month multicomponent behavioral change intervention increased moderate physical activity at least 600 METs-minutes per week and increased the walking level on frequency duration and intensity. Nurses used six telephone call-based consultations for 15-20 minutes per one month for 6 months. Behavioral intervention was developed by social cognitive theory and self-efficacy. The adopted behavioral change strategies consisted of goal setting, self-monitoring, and feedback that aimed to increase physical activity. Exercise self-efficacy scale increased from baseline to six-months among intervention group. Thus, the feedback on progression and tailored advice for setting the goals of CAD patients increased the level of physical activity and increased exercise self-efficacy. For older adults with CAD, home-based exercise was an effective intervention. Gary (2006) mentioned that 12-week period for walking exercise combined with education program increased exercise self-efficacy, walk distance, exercise exertion. This result was consistent with Rajati et al. (2014) found that integrating the four strategies of exercise self-efficacy including learning by doing, role modeling, positive feedback, and recognition of sign and problem-solving had positive effects on confidence to initiate exercise and recover heart symptoms in short period (6 months). Therefore, self-efficacy intervention for physical activity and exercise had benefit in improving exercise behavior among CAD patients in a short-term period.

Self-efficacy intervention and stress management

Stress is one of the most common physiological responses and CAD patients' complaints (Dimsdale, 2008). The immune system is affected by the activation

of the stressor that enhances cardiovascular reactivity, increases blood pressure and heart rate resulting from an excessive sympathetic nervous system activity (O'Leary, 1992). Stress affects both physical and emotional aspects (Dimslade, 2008). Most of CAD patients have experience with stress after heart attack. For example, patients with CAD feel depressed and anxious about the disease and treatment (AHA, 2017). Depression also relates to cardiac risk factor self-efficacy and stressful behaviors (Banman & Sawatzky, 2017). Thus, patients' coping strategies play a major role in determining the impact of a stressor in patients with CAD.

Self-efficacy for a particular task has been studied an integral part of the active coping process (O'Leary, 1992). The perception of self-efficacy is showed as a variable with effects prior to coping responses (Gandoy-Crego et al., 2016). The perception of self-efficacy facilitates cognitive concerning of an individual ability that influences as motivators of action (Banman & Sawatzky, 2017). Parswani et al. (2013) used mindfulness-based stress reduction program for CA patients. This program consisted of mindfulness meditation that helped patients to eliminate negative thought and enhance an ability to tolerate and the negative mood stage. Patients were encouraged to engage the activities with a sense of mastery and pleasure. It is indicated that mindfulness increases self-efficacy and help CAD patients combat low mood as well as reduce anxiety and depressive symptom (Parswani et al., 2013). Self-efficacy is also related to social support (Tkatch et al., 2016). Menne et al. (2016) found that heart health program provided the better understanding the effect stress and decision to make a healthy behavior. This program encourages patients to complete action step on their own with the support of peers (Menne et al., 2016). Thus, self-efficacy is a significant factor to support coping strategy for stress management.

Nursing implication and limitations

This review provides the evidence of the relationship between self-efficacy and health behavior. For this paper, nurses can develop the intervention regarding self-efficacy for CAD patients and other chronic diseases. However, the lack of the self-efficacy evidence on drinking behavior, diet/eating behavior and stress management is a limitation of this paper. The further study is needed to better understand how much self-efficacy influences alcohol consumption or substance

abuse among CAD patients. Also, more research is needed determining the role that self-efficacy plays in stress management and co-morbidities of CAD such as diabetes mellitus and hypertension.

Future directions

Self-efficacy intervention plays a significant role to promote a healthy behavior. Moreover, several studies used self-efficacy as a moderator and/or mediator to predict health behavior and combined with other health promotion theories such as transtheoretical model, health belief model, self-regulation, and self-determination. A lack of integrating the theories may not fully explain the lifestyle behaviors. Therefore, the further study should study the effect of a mixed model intervention on health behavior among CAD patients.

Conclusion

Self-efficacy will play as a buffer role to increase ability to perform healthy lifestyle in which focuses on positive expectation outcomes such as physiological and psychological well-being. Upon this review, self-efficacy interventions especially for physical activity or exercise have been indicated the causal role and strongly promote health-related behavior as well as predict health outcomes. The finding indicates that self-efficacy affects health behavior among CAD patients in which can promote CAD patients to modify their risky health issues. For example, self-efficacy interventions have been intervened to promote exercise and eating behavior following the expected outcome such as the body weight, and lipid profile. For further studies, researcher should conduct a psychoeducational intervention to evaluate the effectiveness of self-efficacy on health-related behavior. Moreover, engaging in healthy lifestyle is based on functional status of cardiac disease. Researchers need to assess the cardiovascular parameter such as ejection fraction to assure that the intervention is carried out in a safe manner during cardiac rehabilitation. Cardiac self-efficacy may improve health outcomes and provide a motivation for health practice for those recovering in rehabilitation period.

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