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Alternative coping strategies and decision delay in seeking care for acute myocardial infarction.

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Alternative Coping Strategies and Decision Delay in Seeking Care for Acute Myocardial

Infarction

By

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A Thesis
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ABSTRACT

This secondary analysis study utilized 135 AMI patients to examine the extent of use of 15 alternative coping strategies and their relationship with decision delay and five demographic variables. The three most frequently used coping strategies were trying to relax, wishing/praying for symptoms to disappear and discussing symptoms with someone. The results showed that nine coping strategies were significantly associated with delay. Several demographic factors were also found to be related to the use of coping strategies. The findings of this study are meaningful in teaching patients about avoiding the use of coping strategies when faced with AMI symptoms. This can potentially help reduce delays in seeking care for AMI, which prevent patients from obtaining life-saving treatment.

DEDICATION

First, I would like to dedicate this research study to my husband, Daniel, who supported me financially, spiritually and emotionally through all of my educational endeavours.

Also to my children, John-Ross and Yasmina, who constantly show me how to unpretentiously enjoy the simple things in life and fill my days with laughter.

Thirdly, I would like to thank my mother, Rodica, and grandmother, Dorina, for teaching me that education is important and worth following through. Also, I need to thank them for helping me with childcare and constant support. Though I spent only 13 years of my life with my grandpa before cancer took him away, I do need to thank him for instilling in me ambition and determination to succeed in school.

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CHAPTER I

INTRODUCTION

Acute myocardial infarction (AMI) is an event that taxes one's ability to cope with internal stimuli (i.e. symptoms) that signify disease. Individuals experiencing AMI often have a period of time during which they engage in coping processes that are directed toward regulating the emotional consequences of the stress associated with the AMI experience (i.e. emotion-focused coping) and/or ameliorating or inhibiting these symptoms (i.e problem-focused coping). However, these coping efforts may prevent patients from attaching the correct label to their symptoms and may thus prevent them from seeking prompt treatment (Reynolds & Alonzo, 2000; Fox-Wasylyshyn, 2005). The investigation of coping strategies may play an important role in providing guidance with respect to decreasing delay in AMI patients' decisions to seek medical attention (i.e. decision delay). That is, identifying the coping methods that individuals employ in response to AMI symptoms may allow clinicians and educators to create relevant teaching strategies that may reduce delay, and consequently reduce the morbidity and mortality associated with AMI decision delay.

Significance of the Problem

Cardiovascular disease, including AMI, is the leading cause of death among all races and genders in Canada as it claims 78,000 lives annually (National Quality Measures Clearinghouse [NQMC], 2006). AMI, known to the public as a heart attack, is associated with injury to the myocardium due to ischemia resulting from occlusion of blood flow in the coronary arteries that supply blood to the heart. With complete coronary

blockage, the ischemia progresses to necrosis and death of cells in the affected area if the heart muscle is not reperfused (Lewis, Heitkemper & Dirksen, 2000).

According to the NQMC (2006), 38,000 Canadians were hospitalized for AMI in 1996. Of these, 15% died within 30 days and 23% died within a year of the AMI experience. It is estimated that the average life lost due to a heart attack is 14.2 years (American Heart Association [AHA], 2006). Within six years post AMI, 22% of men and 46% of women are expected to develop heart failure, while another 8% of men and 11% of women are projected to suffer a stroke (AHA, 2006). Due to these subsequent morbidities, 30% of Canadians suffering from heart disease are not able to work after their AMI (NQMC, 2006). In addition to its impact on morbidity and mortality, cardiovascular disease, including AMI, places a great financial burden on the individual and the health care system. In 1998, the approximate cost for treating cardiovascular disease in Canada was $19 billion. This sum consisted of $6.8 billion in direct costs and 11.6 billion in indirect costs (NQMC, 2006).

Approximately 50% of AMI patients die before reaching the hospital (Dracup et al., 1995). However, the timely administration of reperfusion therapies such as thrombolytic medications and percutaneous transluminal coronary angiography (PTCA) has the potential to restore circulation to injured and ischemic heart muscle. Consequently, reperfusion therapies can prevent the extension of the infarct and reduce associated morbidity and mortality (De Luca et al., 2004). Thrombolytic medications are administered intravenously to dissolve the blood clot and restore circulation to injured and ischemic cells (AHA, 2005), while PTCA uses a balloon tipped-catheter that is inflated in the occluded coronary artery to increase its diameter. However, the

effectiveness of reperfusion therapies is time dependent. Restoring circulation within two hours of symptom onset can prevent further death of the myocardial cells. Beyond six hours, the benefits of myocardial salvage are lost, but revascularization may prevent further damage (American College of Cardiology/American Heart Association Task Force on Practice Guidelines, 2004; Rawles, 1997). Rawles conducted a randomized control trial and found that every 30-minute delay in receiving thrombolytic therapy was equivalent to the loss of one year of life ($p = 0.012$). Brodie et al. (1998) found that post-AMI mortality was lowest in patients receiving PTCA within two hours of symptom onset.

The aforementioned reports suggest that delay in seeking treatment reduces the effectiveness of reperfusion therapy, and consequently leads to increased morbidity and mortality in people experiencing AMI. Statistics have shown that half of those who experience AMI wait more than two hours before seeking emergency care (Antman et al., 2004; Dracup, McKinley & Moser, 1997; Michigan State University, 2004; National Registry of Myocardial Infarction, 2005). Given the health-related consequences associated with delay in seeking treatment, it is important to develop a better understanding of the factors that contribute to delays in seeking care for AMI. An extensive body of literature focuses on a multitude of potential predictors of delay in seeking care for AMI. Some of the variables that have been examined include sociodemographic variables, type of medical insurance, situational factors, clinical variables, choice of transportation, emotional/cognitive factors, symptom congruence, symptom appraisal and culture. Although these studies help to identify risk for delay, it is the time-consuming activities in which people engage before they decide to seek medical

attention (i.e. their alternative coping strategies) that concretely cause delay. Although several studies have quantitatively investigated specific coping strategies in terms of how they contribute to delay (Alonzo, 1986; Ell et al., 1994; Dracup and Moser, 1997; Finnegan et al., 2000; Johansson, Stromberg & Swahn, 2004; Kentsch et al., 2002; Leslie, Urie, Hooper and Morrison, 2000; McKinley, Moser and Dracup, 2000), these studies were limited with regards to the number and nature of coping strategies examined. Several studies have explored the coping strategies that AMI patients employ in effort to manage or relieve their initial symptoms, or to decrease the emotional stress associated with these symptoms in terms of their association with delay in seeking treatment for AMI (Fox-Wasylyshyn, 2005; Pattenden, Watt, Lewin & Stanford, 2002; Rosenfeld, Lindauer & Darney, 2005; Ruston, Clayton & Calnan, 1998; Walsh, Lynch, Murphy & Daly, 2004). However, most of these studies did not examine specific types of coping strategies displayed by AMI patients. Instead, they reported data pertaining to the broader categories of these strategies (i.e. distraction and denial). Knowledge of the specific types of coping strategies can be very helpful in guiding health professionals to structure their interventions.

To date, most of the studies that examined the phenomenon of delay in seeking treatment for AMI were atheoretical in nature. That is, they did not use a conceptual framework to demonstrate the interrelationship among factors believed to contribute to delay in seeking care for AMI. The use of a conceptual framework is significant in providing a better understanding of the interaction among predictors of delayed hospital presentation. The Self-Regulatory Model (Finnegan et al., 2000; McKinley et al., 2000; Walsh et al., 2004) and the Social Cognitive Theory (Finnegan et al., 2000) were utilized

in the research literature to explain decision delay. However, only the Self-Regulatory Model was actually tested in research. The AMI Care-Seeking Model (Fox-Wasylyshyn, 2005) is the only data-generated conceptual framework that depicts a relationship between coping strategies and decision delay in AMI patients. However, this model did not provide information regarding the impact of specific coping methods on decision delay. Instead, it defined coping strategies within the context of an abstract psychometric measure of emotion-focused coping. Therefore, this study utilized the AMI Care-Seeking Model as a framework to guide the examination of specific coping strategies in terms of their impact on delay in seeking treatment for AMI. In addition to examination of emotion-focused coping, this study examined the impact of several problem-focused coping strategies that were not part of the AMI Care-Seeking Model. Identification of emotion- and problem-focused coping strategies is anticipated to aid in the development of interventions that can ultimately reduce decision delay in AMI patients.

<div align="center">Types of Coping</div>

When persons are faced with a threat to their health, such as AMI, they respond by implementing coping strategies that help them manage the threat. According to Lazarus & Folkman (as cited in Rice, 2000) coping is defined as constantly changing efforts to deal with internal or external stressors that are surpassing the individual's resources. Coping can be divided into two broad categories. Efforts that serve to regulate the emotions produced by the stressor(s) are called *emotion-focused coping* (Rice). This category of coping includes denial, positive reinterpretation of symptoms and minimization of symptoms (Carver, Scheier & Weintraub, 1989). *Problem-focused coping* includes efforts such as direct action or seeking assistance from others that are

meant to reduce or inhibit a stressor(s) (Carver, Scheier & Weintraub). Emotion- and problem-focused coping can be used simultaneously in dealing with a stressor(s). As coping responses prove to be ineffective, individuals reappraise the stressor(s), and re-select coping responses that are believed to be appropriate. However, this can be a time-consuming process. Within the context of AMI, the more coping strategies individuals use, the more delay in seeking care they experience (Fox-Wasylyshyn, 2005). *Alternative coping strategies* include both emotion- and problem-focused coping strategies that prevent the individual from seeking emergency care for AMI symptoms. Specifically, they are the mental and physical coping methods used by persons experiencing AMI before they decide to seek medical attention. Knowing the specific coping strategies that cause individuals to delay seeking care for AMI can lead to the implementation of nursing strategies that may decrease their use.

Purpose of the Study

The general purpose of this study was to investigate the coping strategies that individuals employ in response to AMI symptoms. Specifically, this study examined: (a) the extent to which alternative coping methods are used by persons who experience AMI, (b) how specific alternative coping strategies relate to AMI decision delay, and (c) the association between selected demographic characteristics and the use of coping strategies.

Conceptual Framework

A review of the literature yielded two models that specifically address the phenomenon of deciding to seek care for AMI. These are the AMI Coping Model (Figure 1; Reynolds & Alonzo, 2000) and the AMI Care-Seeking Model (Figure 2; Fox-Wasylyshyn, 2005). The latter model was selected as the conceptual framework for this

study primarily because its concepts are less abstract (composed of specific measurable variables) than the AMI Coping Model, and thus lends itself to empirical testing. Because the AMI Care-Seeking Model has its origins in the AMI Coping Model, both models are described in the following text.

<div style="text-align: center;">*The AMI Coping Model*</div>

The AMI Coping Model (Reynolds & Alonzo, 2000), as illustrated in Figure 1, is a mid-range theory (i.e. a practical structure of concepts that is directly testable in research, [Smith & Liehr, 2003]). It was developed to conceptualize individuals' cognitive and behavioural responses to symptomatic stimuli that are indicative of AMI. The major assumptions of this model are that: (a) individuals are active problem solvers who intentionally and consciously engage in emotional and physical efforts to regulate stressors, (b) individuals strive for a stable social identity in every situation, (c) sentiments have a persuasive, compulsory quality that depends on perception and response to the environment, and (d) emotional arousal occurs automatically based on continuous experience and action. AMI results in physiological and mental stressors that surpass the persons' coping resources. The process by which individuals attempt to restore balance in a situation where symptoms are indicative of AMI is explained in four phases that are described below.

Phase I: Impulse and Cognitive Recognition

This phase begins with the experience of persuasive symptomatic stimuli, which compels the individual to attach meaning to them (Reynolds & Alonzo, 2000). The cognitive processes in which individuals engage in effort to understand and interpret symptoms lead to the adoption of a set of beliefs about the cause of the symptoms,

possible length of the illness, its treatment and probable consequences. This set of beliefs constitutes one's illness representation. Phase I concludes with the formation of a tentative label or supposition in relation to the meaning of the symptoms. Based on the interpretation of the meaning of the symptoms, the person develops a coping method that involves knowledge, actions, and attempts to regulate emotions.

Phase II: Perception and Covert Action Plan

This phase is focused on covert coping, which refers to a cognitive plan of action that is targeted at restoration of balance (Reynolds & Alonzo, 2000). Individuals mentally search the external and internal environment for possible causes, explanations, outcomes and ways to ameliorate their symptoms in order to reach stability. These covert actions involve the use of current knowledge and knowledge from past experiences, as well as perceived resources available to the individual.

Phase III: Overt Manipulation

The main components of this phase are unconcealed actions, manipulation and recurrent appraisal of the symptoms (Reynolds & Alonzo, 2000). This implies that the individual implements the plan of action that was previously contemplated. The plan of action is constantly evaluated for the effectiveness of instrumental efforts and resources and the availability of accurate information that is congruent with the client's current experience. The individual and lay others also evaluate if emotional and affective responses to symptoms and their related coping efforts are under control, and not interfering with instrumental coping and assessment. If overt manipulation of the physiological, emotional and material environment of the person is or becomes ineffective due to persistent or changing symptoms, the individual concurrently attempts

Impulse & Cognitive Recognition	→ ←	Perception & Covert Action	→ ←	Overt Manipulation	→ ←	Assessment & Consummation

⟶   Coping Processes

◄----------   Recursive Processes
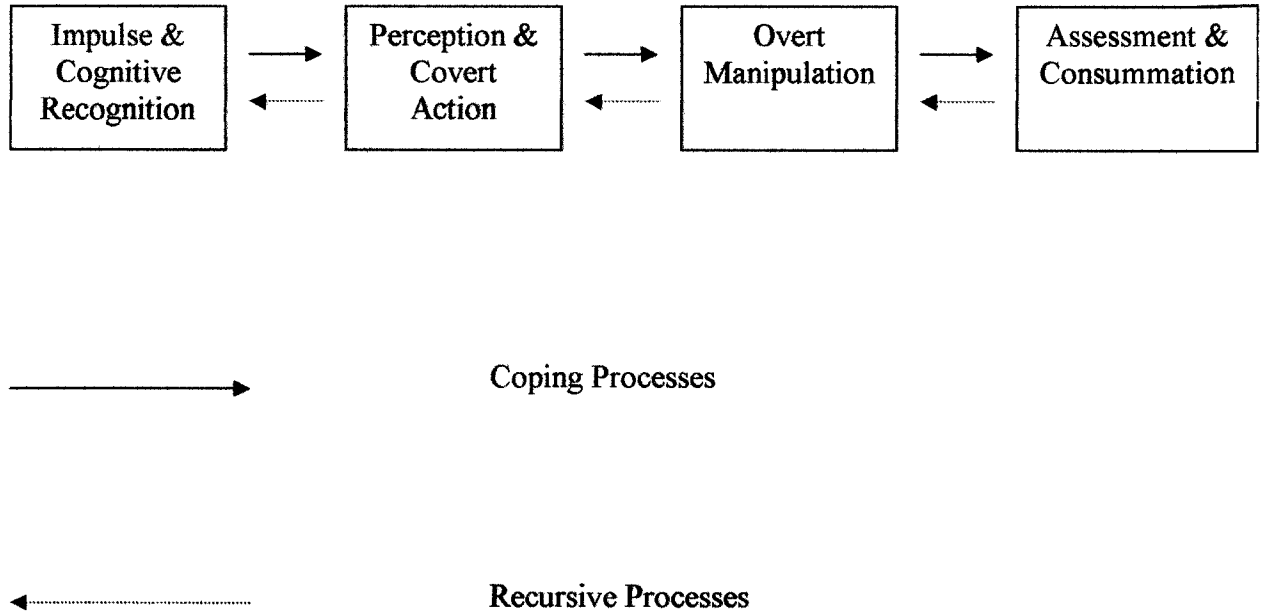
Figure 1. The Acute Myocardial Infarction Coping Model (Reynolds & Alonzo, 2000)

to re-label the symptoms and develop another strategy to restore equilibrium. Therefore, phases I and II of the model are revisited until the final phase, assessment and consummation is reached.

Phase IV: Assessment and Consummation

This phase is characterized by the achievement of balance, completion of the plan of action and diminished emotional arousal (Reynolds & Alonzo, 2000). Consummation is reached when the AMI episode is under control and a level of equilibrium is attained. However, in reality, individuals will continue to cope with the sequelae of AMI over a long period of time.

The Interrelationship of Emotions and Coping

Emotions are a result of innate states of arousal and the cognitive appraisal that is developed from the social context of the different situations in which individuals find themselves (Reynolds & Alonzo, 2000). At the biopsychological level, AMI symptoms have the ability to evoke fright, nervousness and a sense of vulnerability. These emotions occur because of the difference between what the individual expects to occur and what is actually happening. Emotional arousal is the product of the relationship of physiological stimulation and previous knowledge about the possible cause of this arousal. This tumultuous emotional stimulation requires the development of a coping method, which will allow attainment of a level of comfort that is closer to the individual's normal state of being (Reynolds & Alonzo).

Influence of Prior AMI

Individuals with a personal history of AMI do not tend to seek more timely medical care when faced with symptoms of another AMI as compared to individuals who

are experiencing their first AMI (Reynolds & Alonzo, 2000). This is troublesome, because the risk of complications and death is greater in patients who experience recurrent AMIs. Reynolds and Alonzo (2000) suggest that delay in seeking treatment in individuals with a subsequent AMI can be attributed to three different reasons. First, individuals create personal illness representations that may be very different from the symptoms of subsequent AMIs. This leads individuals to mislabel symptoms and results in delay in seeking medical attention. Second, patients participating in cardiac rehabilitation programs often believe that they have a lower risk of developing a subsequent AMI. Thus, false optimism results in delay in seeking treatment for AMI. Third, AMI patients experience trauma due to: (a) cardiac symptoms that may signify loss of life, (b) calling emergency medical services and entering the hospital, and (c) administrative issues associated with being a client in a modern health care system. These traumatic events may cause the individual to develop symptoms similar to post-traumatic stress disorder. This inhibits the person's cognition from processing negative stimuli, leading to a delay in seeking emergency care.

This study examined the effect of various coping strategies that individuals employed in response to symptoms of AMI. These strategies are reflective of overt manipulation that occurs during phase III of Reynolds and Alonzo's (2000) AMI Coping Model.

Fox's Model of Delay in Seeking Treatment for AMI

As previously indicated, the AMI Care-Seeking Model (Fox-Wasylyshyn, 2005) represents a data driven adaptation of the AMI Coping Model (Reynolds & Alonzo, 2000). Fox-Wasylyshyn's model (Figure 2), tested via structural equation modeling,

suggested that greater symptom congruence, lesser use of alternative coping strategies, and attribution of symptoms to the heart or heart-related illness representation (HRIR), were associated with more rapid decisions to seek medical care. These propositions are all consistent with the AMI Coping Model. However, contrary to Reynolds and Alonzo's prediction, Fox-Wasylyshyn's model suggests that, although a previous history of AMI may have a direct relationship with decision delay, its total effect on decision delay is not significant.

This study investigated the relationship between alternative coping strategies and decision delay. The AMI Care-Seeking Model (Fox-Wasylyshyn, 2005) suggests a positive relationship between decision delay and the extent of use of alternative coping strategies. However, Fox-Wasylyshyn established a psychometric measure that was composed of five items, all of which were indicators of emotion-focused coping. Although the initial intent was to include items that are indicative of problem-focused coping, Fox-Wasylyshyn reported that reliability and validity testing revealed that none of those items belong to her psychometric measure. Thus, it is not clear if coping strategies that are indicative of problem-focused coping are similarly related to AMI decision delay. In fact, Fox-Wasylyshyn recommended that measures that incorporate emotion- as well as problem-focused coping indicators be further investigated and that the AMI Care-Seeking Model be re-tested using such measures. Hence, this study built upon the AMI Care-Seeking Model and examined the associations of 15 discrete alternative coping strategies with decision delay.
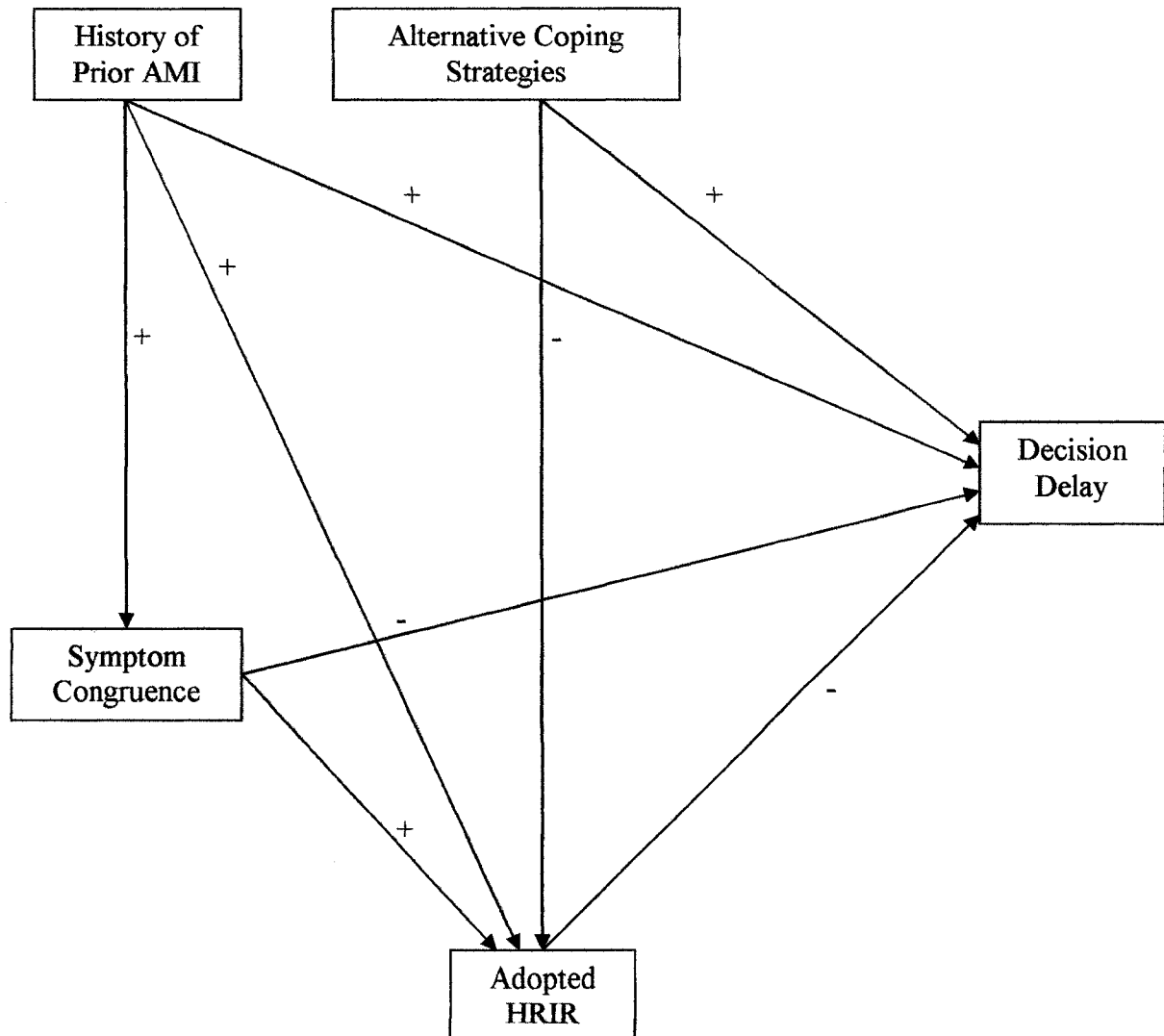
Figure 2. The AMI Care-Seeking Model (Fox-Wasylyshyn, 2005)

Research Questions

This study sought to answer the following research questions:

1. To what extent are specific alternative coping strategies used by individuals who experience AMI?

2. What alternative coping strategies are associated with decision delay in AMI patients?

3. Do the 15 alternative coping strategies or decision delay differ across gender, education and country of residence?

4. Are age or income associated with the 15 alternative coping strategies or with decision delay?

Significance for Nursing

The reduction of delay in seeking care for AMI and prompt treatment of AMI can have a tremendous impact on individuals' chances for survival and their post-AMI quality of life. Therefore, this study has significant implications for nursing practice. The results of this scholarly investigation identified specific coping strategies that are associated with decision delay in AMI patients. Knowledge of the particular coping methods that contribute to delay in seeking care for AMI can be incorporated in teaching interventions for AMI patients. Educating patients about the concrete coping strategies that tend to result in decision delay may help reduce their use of these coping strategies, thus accelerating their decisions to seek medical care. These educational interventions can be included in public education messages or implemented with AMI patients in cardiac rehabilitation centers and acute care hospitals.

Delay in seeking care for AMI is a multifaceted process that has not been fully understood. For instance, most research studies on delay in seeking treatment for AMI have focused on the characteristics of the individual and his/her environment. Few studies in the literature addressed the specific coping strategies that people utilized in response to cardiac symptoms. Furthermore, most studies on the topic of delay in seeking treatment in AMI patients were atheoretical in nature. Therefore, this study was unique, because it was the first to utilize quantitative research methods to test the impact of 15 coping strategies on decision delay. In addition, the findings of this study provided greater specificity with regard to the nature of coping strategies depicted in the AMI Care-Seeking Model (Fox-Wasylyshyn, 2005) that are likely to impact delay.

The findings of this study can be further utilized for future research that may expand on this area of research and contribute to the body of nursing literature. The results of this research may also be used towards the development of evidence-based practice guidelines that will provide sound direction for nursing practice.

CHAPTER II

REVIEW OF LITERATURE

Search Strategy

Research articles used in this literature review were obtained via a systematic review of the literature using four electronic databases that were accessed through the University of Windsor Leddy Library website: Proquest, Medline, Pubmed and the Cumulative Index of Nursing and Allied Health Literature. Five cardiovascular journals (Circulation, Circulation Research, Hypertension, Stroke, Arteriosclerosis, Thrombosis and Vascular Biology) were also searched on the American Heart Association (AHA) website. Keywords used to search articles were predictors of delay, pre-hospital delay, factors in delay of treatment, delayed hospital presentation, causes of delay, reasons for delay in treatment, decision-making for pre-hospital delay, treatment-seeking delay, denial, emotion-focused coping, symptom congruence, symptom perception and symptom expectations. These keywords were combined with the key words acute myocardial infarction (AMI) or heart attack. The keywords were present either in the title, abstract, or text of the article when the search was performed. The search was limited to articles that were published between 1986 and 2006. This approach yielded 39 articles that were relevant to the current study. Reference lists of research reports were also scanned for potentially relevant articles. This resulted in four articles. E-mail addresses of the authors obtained from abstracts of research articles were used to obtain two additional articles.

Phases of Delay in Seeking Treatment for AMI

There are two major sets of factors that contribute to delays in receipt of timely medical care by individuals experiencing AMI. These include those that contribute to: (a)

pre-hospital delay, which is the time interval from the start of acute symptoms of AMI to arrival at the hospital (Henderson, Magana, Korn, Genna & Bretsky, 2002; McGinn et al., 2005; McKinley et al., 2004; Walsh et al, 2004; Zerwic, Ryan, DeVon & Drell, 2003); and (b) in-hospital delay, which is the time from the patient's hospital arrival to the administration of treatment (McGinn et al.; Walsh et al.). The pre-hospital delay phase can be further divided into sub-phases such as decision delay and ambulance delay. Decision delay incorporates the time period from the commencement of symptoms to the individual's decision to seek treatment (Bleeker et al., 1995; Burnett et al., 1995; Carney, Fitzsimons & Dempster, 2002; Ell et al., 1994; Johansson et al., 2004; Kentsch et al., 2002; Leslie et al., 2000; Perry, Petrie, Ellis, Horne & Moss-Morris, 2001; Walsh, et al.; Wu, et al., 2004). Ambulance delay has been defined as the time from the patient's call for emergency services to arrival at the hospital (Wu et al.). It is important to note that pre-hospital delay is believed to account for up to 75 % of the total time elapsed until the patient receives treatment (McGinn et al.), and that decision delay constitutes the largest proportion of pre-hospital delay.

Most studies that are discussed in the upcoming literature review used the time interval from symptom onset to arrival at a hospital (i.e. pre-hospital delay) as the outcome variable. However, this variable can be affected by other extraneous variables such as mode of transportation and the distance of travel to the hospital (that cannot be modified by the individual). Hence, this study examined decision delay as the outcome variable, because it is under the direct control of the person experiencing AMI symptoms and is potentially amenable to nursing interventions.

Factors Influencing AMI Delay

A review of the literature pertaining to AMI delay suggests that many variables have been examined as potential predictors of delay. These variables include, but are not limited to, sociodemographic variables, type of medical insurance, situational factors, clinical variables, choice of transportation, emotional/cognitive factors, symptom congruence, symptom appraisal, and culture. Given that this study is using Fox-Wasylyshyn's AMI Care-Seeking Model (2005), only variables included in this model are discussed in the following text. These variables are symptom congruence, attribution of symptoms to the heart (i.e. adoption of a heart related illness representation), history of AMI, and alternative coping strategies. Special attention is given to those studies that examined the association between AMI delay and alternative coping strategies.

Delay and Symptom Congruence, Symptom Attribution, and History of AMI

Empirical evidence suggests that individuals' AMI symptom experiences often differ markedly from their perceptions of how a heart attack would feel (Finnegan et al., 2000). The perception of AMI symptoms is influenced by media portrayals of heart attack symptoms as sharp, crushing chest pain accompanied by collapse (Ruston et al., 1998). Symptom congruence refers to the match between the patient's expectations of symptom manifestation and the actual symptom experience (Fox-Wasylyshyn, 2005). Several studies that examined the relationship between symptom congruence and AMI delay found that lower symptom congruence was associated with greater pre-hospital (Horne et al., 2000; Perry et al., 2001; Zerwic et al., 2003) or decision delay (Fox-Wasylyshyn). The degree of symptom congruence influences individuals' interpretation of the source of the symptoms as heart related or non-heart related (Fox-Wasylyshyn), which

subsequently impacts their selection of coping strategies (Burnett et al., 1995; Carney et al., 2002; Johansson et al., 2004; McKinley et al., 2004; Wu et al., 2004). Several research studies found that persons who attributed their symptoms to the heart were more likely to seek timely medical care for their symptoms (Burnett et al.; Fox-Wasylyshyn; Johansson et al.; McKinley et al.; Wu et al.).

Research findings pertaining to the relationship between AMI delay and history of previous AMI are inconsistent. Six research studies (Goldberg, Gurwitz & Gore, 1999; Goldberg et al., 2002; Henderson et al., 2002; Meischke et al., 1993; Sheifer et al., 2000; Wu et al., 2004;) found that history of a previous AMI was related to earlier hospital presentation. Conversely, Goldberg et al. (2000) and Yarzebski et al. (1994) found that patients experiencing a recurrent AMI were significantly more likely to delay seeking care. Other studies (Dracup et al., 1997; Dracup & Moser, 1997; Ell et al., 1994; Johansson et al., 2004; McGinn et al., 2005; Perry et al., 2001; Walsh et al., 2004) found that a history of prior AMI was not a significant predictor of pre-hospital delay. In her theory-testing study, Fox-Wasylyshyn (2005) found that experience with a prior AMI had a direct positive relationship with decision delay. However, the total effect (direct and indirect effects) of previous AMI on decision delay was not significant.

Delay and Sociodemographic Characteristics

This study examined five sociodemographic variables (i.e. age, gender, education, income and country of residence) in relation to 15 alternative coping strategies. Only two other studies (Alonzo, 1986; Leslie et al., 2000) in the research literature investigated the association of demographic characteristics (age and gender) with AMI coping strategies. Alonzo ($N = 1102$) reported that males were significantly ($p < .001$) more likely than

females to seek the advice of a spouse, which subsequently led to increased delay. However, there was no association between age and gender with respect to seeking the advice of a physician. In contrast, Leslie et al. ($N = 313$) found that females were more likely than males to seek the advice of a physician.

AMI Delay and Alternative Coping Strategies

Fox-Wasylyshyn's (2005) AMI Care-Seeking Model suggests that decision delay in AMI patients is related to increased use of emotion-focused coping strategies, which were defined as coping approaches intended to regulate the emotional consequences of the stress produced by the AMI symptoms. The literature search revealed several studies that investigated the coping methods that individuals employ when experiencing AMI. The following text provides a critical summary of these studies.

Rosenfeld et al. (2005) conducted a qualitative study with 52 women to identify decision trajectories in response to symptoms of AMI. Two themes, knowing and managing, were extracted from the data. Individuals in the knowing group were more likely to seek care within one hour of symptom onset because they attributed the origin of their symptoms to the heart. However, the presence of co-morbidities posed difficulties in labeling symptoms as cardiac in origin. Persons from the managing group did not recognize their symptoms as heart related and had the longest pre-hospital delay. These individuals became involved in distractive (self-treatment, repositioning) and minimizing behaviours (denial, hoped the symptoms would disappear) until the symptoms could not be tolerated anymore, or until someone else decided to call emergency services or bring them to the emergency department.

Ruston et al. (1998) conducted a qualitative study to identify differences in responses to AMI symptoms in 43 participants. Non-delayers distracted themselves by pacing or drinking, while attempting to interpret the nature of the internal stimuli based on knowledge, experience, and intuition. Non-delayers were also found to have greater knowledge of heart attack symptoms. Delayers (> 4 hours) consulted with others, denied the significance of the symptoms, and engaged in self-treatment and evaluated its effectiveness. Delayers also believed that a heart attack is a sudden, dramatic experience as portrayed in the media. Increases in symptom severity led to final action, which involved seeking emergency care.

In a study by Pattenden et al. (2002), investigators examined the process by which persons ($N = 22$) with a history of AMI decided to seek medical care for a recurrent AMI. The authors reported that symptom appraisal was blurred by the presence of atypical symptoms of AMI, which led individuals to minimize the significance of their symptoms and subsequently to delay seeking care. Patients who had a history of coronary artery bypass graft or angioplasty, participated in cardiac rehabilitation, or who had improved their lifestyle did not perceive themselves to be at risk for another AMI. Most of these patients delayed seeking medical care until symptoms became unbearable.

Walsh et al. (2004) tested the utility of the components of the Self Regulatory Model (Leventhal, Meyer & Nerenz, 1980) in explaining pre-hospital delay in a sample of 61 AMI patients from Ireland. This model posits that individuals interpret symptoms based on previous experiences and engage in coping methods based on initial symptom interpretation. Coping was measured with the Coping Response Inventory (CRI), which includes five categories of coping methods: problem-focused, emotion-focused, active-

cognitive, active-behavioral approach and avoidant style. Unfortunately, the authors did not provide a description of these categories. The CRI is not specific to coping with symptoms of AMI. Multiple regression analysis suggested that individuals with active-cognitive (β = -.40, p < .001) and problem-focused (β = -.38, p < .002) coping styles had a shorter pre-hospital delay. The other three coping styles were found not to be predictors of pre-hospital delay. The Self Regulatory Model explained 37% of the variance in patient delay. Because the authors did not specifically define their coping categories, it is difficult to interpret the findings in terms of what specific coping methods might have influenced delay among this group of patients. This limits the study's usefulness for designing interventions that aim to influence specific coping methods.

The research conducted by Johansson et al. (2004) investigated decision delay in a sample of 403 Swedish patients with suspected AMI. The most frequent initial response of AMI patients to cardiac symptoms involved talking with a spouse and self-medicating with nitrates (reported by 59% and 36% of participants, respectively). Neither of these coping responses was related to decision delay. Multiple regression analysis of data pertaining to those patients in whom AMI was confirmed revealed that talking to a general practitioner was a significant predictor of decision delay greater than one hour (OR = 12.92, p < .002).

Kentsch et al. (2002) conducted a retrospective descriptive study with German patients (N = 739) to describe factors associated with decision delay. The study questionnaire, which was developed by the study authors, measured multiple variables related to demographics, symptom experiences, coping methods, and beliefs about AMI. The authors reported that the following variables were independent predictors of decision

delay greater than one hour: waiting to see what happens once AMI symptoms occurred (OR = 3.53, p < .001), self-medicating with analgesics (OR = 2.01, p = .040), and ignoring symptoms (OR = 2.07, p < .001). Asking other people for advice led to a quicker decision to seek emergency care (OR = .46, p = .007). Believing that the illness could be self-managed, and engaging in distractive activities were not associated with decision delay.

A British study performed by Leslie et al. (2000) investigated reasons for pre-hospital delay and patterns of seeking medical care in 313 subjects. Fifty five percent of participants called their general practitioner as their first action in response to symptoms. The most common coping methods of patients who delayed more than one hour included expecting the symptoms to disappear (49%), thinking symptoms are not serious (29%), and self medicating with nitrates (37%). Unfortunately, the coping methods reported in this research were not subjected to inferential statistical analyses, and thus interpretation of these results is limited. Thus, it is not possible to draw conclusions with regard to how these coping strategies impacted delay.

O'Carroll et al. (2001) performed a retrospective study with 72 subjects in the United Kingdom to identify psychological predictors (cardiac denial, cardiac anxiety, health locus of control, alexythmia and neuroticism) of pre-hospital delay. Psychological variables were measured with the Cardiac Denial Scale, Cardiac Threat Scale, the Toronto Alexithymia Scale, Multidimensional Health Locus of Control Scale, Eysenck Personality Questionnaire-Revised, Beck Depression Inventory and Spielberger State Anxiety Scale. Univariate analysis revealed that delayers displayed higher scores on the Cardiac Denial Scale (p = .042), chance locus of control (p = .002) and lower scores on

neuroticism (p = .023). The other psychological variables did not reach statistical significance. However, multiple regression analysis showed that only health locus of control (beliefs that health is due to chance) was a significant predictor (B coefficient not provided, $p <$ .05) of delayed hospital presentation.

Bleeker et al. (1995) performed a multi-site research study in the Netherlands with a sample of 300 persons with AMI. They sought to identify psychological and cognitive variables related to delay in seeking care for AMI symptoms. Coping was measured through the completion of the Pain Coping Inventory and the Utrecht Coping List. The Pain Coping Inventory measured coping during the acute phase of AMI. This inventory included four scales that measured avoidance of mental and physical effort, worry, distraction, and seeking social support. The Utrecht Coping List measured general coping through the following scales: active managing of problems, palliative reaction, avoiding, seeking social support, expressing emotions, depressive reaction and easing thoughts. Denial was measured with the Denial Questionnaire, which included four subscales: resentment, dependency, anxiety, and vital exhaustion. The authors of this study did not describe any of the subscales. The Denial Questionnaire, which appeared not to be specific to coping with the AMI symptom experience, was completed by the patient and a significant other. Multivariate analysis showed that patients whose decision delay was less than 30 minutes engaged in fewer distraction activities (p = .001), were active problem solvers (p = .031), and were more likely to seek social support ($p <$ .001) during the acute phase of AMI. The overall effect of denial was found to be non-significant.

An international observational study (N = 595) performed by McKinley et al. (2004) in Japan, England, USA and Korea sought to compare variables associated with

delayed hospital presentation. Coping was measured using the Response to Symptoms Questionnaire (Dracup & Moser, 1997), which measured events that occurred before hospital admission, including the patient's cognitive and psychological responses to symptoms. Patients who waited to see if symptoms would go away were less likely to arrive at the hospital within one hour of symptom onset (OR = .36, p < .05).

A qualitative study conducted by Finnegan et al. (2000) investigated pre-hospital delay through five focus groups with a sample of 207 American subjects. The groups were comprised of individuals with prior AMI, bystanders to heart attack victims, and individuals at high risk for AMI. The investigators found that patients coped with symptoms by taking medications (e.g. nitroglycerin, antacids, aspirin), resting, and talking with a physician, family members or friends. In most cases, bystanders advised the client to self-treat and wait for the symptoms to diminish. However, when symptoms worsened, the decision to seek emergency care was frequently made by bystanders.

Alonzo (1986) conducted a study to investigate the effect of a variety of factors on decision delay among 1,000 participants with suspected AMI. He also interviewed 102 family members/lay witnesses of deceased AMI individuals. Alonzo described the AMI experience from symptom onset to hospital care as consisting of six phases. During the self-evaluation phase, individuals attempted to interpret their symptoms and engaged in coping strategies such as self-treatment and waiting to assess the effectiveness of self-treatment efforts. As symptoms became severe, 93.2% of participants discussed their symptoms with family members (usually the spouse), lay others, or a physician. This constituted entry into the lay-evaluation phase. Telling a spouse increased delay in seeking medical care (χ^2 = 13.95, p < .001) as spouses attempted to normalize symptoms

and give advice, such as taking medication. Multivariate analysis revealed that reducing activity, and taking prescribed or non-prescribed medications were predictors of longer self-evaluation (β = .22, β = .16, β = .18, respectively; all p < .001) and lay evaluation phases (β = .11, β = .18, β = .16, respectively; all p < .001), and therefore increased overall decision delay. Lay others were more likely to encourage AMI victims to seek medical care or to call the ambulance on their behalf. During the medical evaluation phase, patients sought advice from a physician. Contacting a doctor between 12 a.m. and 6 a.m. reduced delay (p < .05), as the physicians prompted the participants to contact emergency medical services.

Research conducted by Ell et al. (1994) examined variables associated with decision delay in 448 African Americans who were hospitalized for AMI. Specific coping strategies that were examined included self-medicating, telling someone about their symptoms, and calling a physician or paramedics. Regression analysis revealed that discussing symptoms with a layperson (β = 1.12, p < .001) or a health professional (β = .72, p = .025) were independent predictors of longer AMI decision delay.

Dracup and Moser (1997) conducted a descriptive study of factors related to the decision to seek treatment in AMI patients (N = 277) from 43 centers. The Response to Symptoms Questionnaire, developed by the study authors, was used to measure the context of AMI symptom onset; antecedents of symptoms; emotional, cognitive and behavioural responses to symptoms; and the response of others to the patient's symptoms. This study examined only initial responses to AMI symptoms, and thus did not capture the entire AMI coping experience. That is, data pertaining to coping responses that occurred after participants' initial responses were not collected. A wide range of initial

responses to AMI symptoms were reported. These included trying to relax (reported by 30.7% of participants), wishing or praying the symptoms would disappear (21.7%), pretending nothing was wrong (10.4%), telling a family member (9.0%), self-medicating (8.7%), changing positions (2.9%), going to a physician's clinic or to the hospital (2.5%), calling the ambulance (18%), and doing nothing due to fear of death (1.4%). Multivariate logistic regression analysis revealed that the only predictors of seeking early treatment (< 6 hours) were not waiting to see what happens (OR = 2.67, p = .02) and not worrying about troubling others (OR = 2.04, p = .04).

Initial coping strategies were compared among American (n = 277) and Australian (n = 147) AMI patients by McKinley et al.'s (2000) research team using the Response to Symptoms Questionnaire, which examined initial responses to AMI symptoms. The authors found that the most frequent initial response to AMI symptoms among Australians (36%) and North Americans (85%) was to try to relax. Although inferential statistics were not used, Americans (60%) appeared to be much more likely to pray or hope the symptoms would disappear as compared to Australians (11%). Other coping strategies displayed by the subjects included discussing symptoms with others, self-medicating, denial of symptoms, and distraction. Only 5% of Americans and 2% of Australians called emergency services as a first response to symptoms of AMI. The authors reported that cognitive factors associated with increased delay included fearing the consequences of seeking help (p < .05) in the American group and feeling embarrassed about seeking help (p < .05) in the Australian group. Waiting for symptoms to go away was reported to be associated (p < .05) with increased delay for the whole sample.

Perry et al. (2001) conducted a research study (N = 47) to investigate the association between decision delay and the following variables: the discrepancy of symptom experience and symptom expectation, presence of family members during heart attack symptoms, and individuals' behaviour before calling for help. Individuals who did not try to self-treat their symptoms, and who consulted with others before seeking medical care experienced a shorter delay time (p = .05 and p = .04, respectively).

Zerwic et al. (2003) studied several variables in relation to pre-hospital delay with the Myocardial Infarction Symptoms Profile. This instrument collected data with respect to symptoms experienced, the sequence of events from symptom onset to admission to the emergency department, context of the AMI event, strategies employed to relieve symptoms and pre-hospital delay. Self-treatment (β = .22, p < .01) and contacting a physician (β = .33, p < .01) were significant predictors of longer pre-hospital delay.

Using a sample of 135 hospitalized AMI patients, Fox-Wasylyshyn (2005) investigated the interrelationships among several variables associated with decision delay. The author developed a questionnaire (The Coping with Heart Attack Symptoms Scale [CHASS]) that measured 15 coping strategies that were deemed to be indicative of emotion-focused and problem-focused coping. However, testing of the psychometric properties of the CHASS (i.e. factor analysis and internal consistency) suggested that this instrument was a unidimensional 5-item factor scale of emotion-focused coping strategies. The remaining 10 items had either poor factor loadings, and/or poor internal consistency with the remaining items, and were therefore excluded from the CHASS. Study results showed that emotion-focused coping was an independent predictor of

decision delay (β = .29, p < .001). Individual coping strategies were not examined in terms of their association with decision delay or their frequency of use.

Summary of Literature Review

Review of the literature suggests that a number of coping methods are used to assist patients to cope with the acute phase of the AMI experience, many of which have been found to be associated with AMI delay. Several of these coping methods appear to be reflective of problem-focused coping strategies. Thirteen of the reviewed studies examined the relationship between self-treatment or self-medication and delay. Of these, five studies (Alonzo, 1986; Ell et al., 1994; Kentsch et al., 2002; Perry et al., 2001; Zerwic et al., 2003) found self-treatment to be associated with increased delay in seeking treatment. Four studies (Finnegan et al., 2000; Pattenden et al., 2002; Rosenfeld et al., 2005; Ruston et al., 1998;) provided qualitative support for such a relationship, while one study (Johansson et al., 2004) found no relationship between self-treatment and delay. Others (Dracup & Moser, 1997; Leslie et al., 2000; McKinley et al., 2000) reported the frequency of use of self-treatment or self-medication, but did not provide inferential statistics to support this relationship.

Other coping strategies that might reflect efforts to resolve symptoms, such as repositioning and resting or relaxing, were also reported in the literature. Resting was reported to be associated with longer pre-hospital delay in one quantitative (Alonzo, 1986) and two qualitative (Finnegan et al., 2000; Rosenfeld et al., 2005) studies. One study (Dracup & Moser, 1997) documented repositioning as a coping method, but failed to examine if it was statistically related to delay in seeking care for AMI.

Three quantitative (Ell et al., 1994; Johansson et al., 2004; Zerwic et al., 2003) and one qualitative study (Finnegan et al., 2000) suggested that talking with a physician tends to prolong seeking care for AMI. However, Perry et al. (2001) reported that these two variables were not related, while Alonzo (1986) found that contacting a physician between midnight and 6 a.m. was associated with shorter delay. Five studies that examined the influence of discussing symptoms with a layperson found either qualitative (Finnegan et al.; Rosenfeld et al., 2005; Ruston et al., 1998) or quantitative (Alonzo; Ell et al.) evidence for a positive relationship between these two variables. However, three studies (Bleeker et al., 1995; Kentsch et al., 2002; Perry et al.) found that discussions with laypersons was associated with shorter delay time, while another (Johansson et al.) reported that these two variables were not related.

In addition to problem-focused coping strategies, the literature suggests that individuals experiencing AMI symptoms also engaged in emotion-focused coping strategies. Two qualitative studies (Pattenden et al., 2002; Rosenfeld et al., 2005) suggested that praying or hoping that symptoms would disappear was associated with prolonged delay in seeking care for AMI. Three quantitative studies (Dracup & Moser, 1997; McKinley et al., 2000; Leslie et al., 2000) examined the use of these coping methods, but did not statistically examine their relationship with AMI delay. Three quantitative studies (Dracup & Moser; McKinley et al.; McKinley et al., 2004) found that not waiting for symptoms to go away was associated with decreased delay in seeking care. Similarly, Kentsch et al. (2002) and Finnegan et al. (2000) reported that individuals who chose not to wait and see what happens experienced a shorter delay. Denial was associated with a longer delay in one qualitative study (Rosenfeld et al.) and two

quantitative studies (Kentsch et al.; O'Carroll et al., 2001). Pattenden et al. reported in their qualitative study that patients minimized the significance of their symptoms. Participants who did not think that their symptoms were serious exhibited a longer delay in two quantitative studies (Johansson et al., 2004; Kentsch et al.) and one qualitative study (Finnegan et al.). Bleeker et al. (1995) and Kentsch et al. reported that participants who engaged in distraction activities experienced a longer delay in seeking care for AMI. Ruston et al.'s (1998) qualitative study found that non-delayers engaged in diversion activities such as pacing or drinking.

Gaps in the literature. Review of the literature that examined the association between coping strategies and AMI delay revealed two major weaknesses that were addressed in this study. First, the studies were generally atheoretical in nature. Two exceptions to this (McKinley et al., 2000; Walsh et al., 2004) utilized the Self-Regulatory Model, which can be applied to, but is not specific to AMI. Fox-Wasylyshyn's (2005) test of the AMI Care-Seeking Model was specific to the AMI experience. However, alternative coping strategies were examined only within the context of the concept of emotion-focused coping. Problem-focused coping strategies were not examined in Fox-Wasylyshyn's study.

Second, the majority of the studies that examined coping strategies included only a small number of coping methods. Other studies examined coping within the context of psychometric instruments (Bleeker et al., 1995; Fox-Wasylyshyn, 2005). In one of these (Bleeker et al.), the instruments utilized to measure coping methods were not specific to the AMI experience. While it is useful to examine coping within the context of unifying concepts, information pertaining to the specific coping strategies that comprise the

concepts can be lost, thus making it somewhat difficult to identify specific behaviours or cognitions that may contribute to delay. Most studies that examined coping within the context of AMI measured whether or not individuals employed certain coping methods; they did not rate the extent of use of each individual coping strategy. Hence this study built upon previous research by examining the extent to which a variety of specific coping strategies are used by individuals experiencing AMI, and how these coping strategies are associated with decision delay. This study also examined how specific demographic characteristics are associated with the use of the specified coping strategies.

CHAPTER III

DESIGN AND METHODOLOGY

Research Design

This study entailed secondary analysis of data obtained from a retrospective, observational, cross-sectional study that was originally conducted to examine the predictors of AMI decision delay within the context of theory-testing research (Fox-Wasylyshyn, 2005). Ethics clearance was obtained from the University of Windsor Research Ethics Board; informed consent was waived due to the secondary analysis nature of the study.

Setting and Sample

Participants in the original study were recruited from four hospitals: (a) Henry Ford Hospital in Detroit, Michigan; (b) Beaumont Hospital in Royal Oak, Michigan; (c) Hotel-Dieu Grace Hospital in Windsor, Ontario; and (d) Windsor Regional Hospital in Windsor, Ontario. Subjects were recruited during their hospitalization in cardiac care units or step-down units. A non-probability convenience sample of 135 patients was obtained from the hospitals identified above. The inclusion criteria were: (a) primary diagnosis of AMI as evidenced by a rise in cardiac markers, (b) the patient developed AMI outside of the hospital, (c) at least 24 hours and not more than 96 hours had elapsed since admission, (d) able to speak English, and (e) 18 years of age or older. Patients were excluded if deemed physiologically unstable as demonstrated by: (a) unstable vital signs, (b) receiving mechanical ventilation or vasoactive medications, or (c) actively experiencing distressing symptoms such as chest pain or nausea.

Power and effect size are dependent on sample size and significance level. Because of the non-directional nature of the research questions, a two-tailed alpha level of .05 was used to determine the significance of the results. Assuming a power of .80 and an alpha of .05, power tables (Polit & Hungler, 1999) suggest that 135 subjects allowed the detection of a Pearson correlation of $r = .25$ and above. Although the data were analyzed with Spearman's rho, Pearson's r correlation tables were used in the power analysis; because non-parametric tests such as Spearman's rho are less stringent in terms of sample size requirements (Pett, 1997).

<center>Variable Definitions</center>

<center>*Decision delay*</center>

According to Fox-Wasylyshyn (2005), decision delay is the time interval from AMI symptom onset to the individual's decision to seek treatment. It was operationally defined as the time in hours between the initial occurrence of symptoms and when the participant decided to seek care. It was calculated from the time that participants reported they first noticed symptoms and the time that they made a firm decision to seek medical care.

<center>*Alternative Coping Strategies*</center>

Coping, within the context of AMI, includes the mental and physical efforts that individuals employ in response to internal biophysiological and emotional stressors generated by the AMI symptom experience that exceed the individuals' resources (Reynolds and Alonzo, 2000). These coping efforts are often aimed at restoring physical and emotional balance within the individual. *Alternative coping strategies* among AMI patients refer to the mental and physical coping methods used by persons experiencing

AMI *before* they decide to seek medical treatment (Fox-Wasylyshyn, 2005). That is, they are alternatives to seeking medical care. In this study, alternative coping strategies were measured using 15 items that were deemed to be indicators of coping strategies that individuals may employ in response to AMI symptoms (Fox-Wasylyshyn). Factor analysis and internal consistency testing suggest that five of the coping strategies were reflective of a single concept, deemed to be emotion-focused coping (Fox-Wasylyshyn). Two additional items appear to reflect emotion-focused coping, but this was not supported by psychometric testing. The remaining eight items appear to be indicative of problem-focused coping (see Appendix A for delineation of these items with concepts). Participants rated the extent to which they used each of these 15 strategies on a 5-point likert scale, with 0 representing no use of the strategy, and 4 representing maximal use of the strategy.

<div align="center">Data Collection Procedures</div>

Data in the original study were collected via structured interviews by trained research assistants, who were registered nurses working in the hospitals from where the data was collected. Each research assistant completed Wayne State University's Human Investigation Committee online training and received verbal and written instructions specific to the original study. Research assistants approached potential participants on days 2, 3, or 4 post admission for AMI. They provided the subjects with verbal and written explanations about the study. Those patients that met the inclusion criteria and agreed to participate in the study, signed informed consent forms and allowed the research assistants to review their medical charts.

Data Screening and Analysis

Data were screened and treated for missing values by the investigator of the original study (Fox-Wasylyshyn, 2005). Data were analyzed using the Statistical Package for the Social Sciences (SPSS) 12.0. Descriptive analyses (frequencies, means and medians) were employed to answer the first question, which sought to identify the participants' extent of use of the 15 alternative coping methods in question. Given that the outcome variable was severely skewed ($S = 2.9$), and the ordinal-level of the 15 coping strategies, Spearman's rho was used to answer the second question, which examined the relationship between decision delay and each of the 15 coping strategies. Spearman's rho and Kendall's tau correlation, both non-parametric tests, are appropriate for testing correlations between ordinal and non-normally distributed continuous variables (Pett, 1997). However, Spearman's rho was employed in this study because, unlike Kendall's tau, its correlation coefficient is closer in size to that of Pearson's r coefficient (Pett). Mann-Whitney U-test, which is appropriate for comparing groups on ordinal or non-normally distributed data, was used to compare each of the 15 coping strategies across demographic data such as gender, country of residence, and level of education. The impact of age and income (continuous variables), on the 15 coping strategies was examined using Spearman's rho correlation.

CHAPTER IV

ANALYSIS OF RESULTS

Sample Characteristics

The sample included 41 patients from Detroit, Michigan and 94 patients from Windsor, Ontario. The majority of the participants ($n = 109$; 80.7%) were hospitalized for an initial AMI. Decision delay ranged from 0 to 118 hours with a median of 2.0 hours. The mean age of the participants was 59.7 years ($SD \pm 13.0$). Most of the sample was non-Hispanic White ($n = 125$; 92.6%). Men comprised 71.9% ($n = 97$) of the sample. With regards to level of education, 60.7% ($n = 82$) obtained a high school education or less. The most frequently reported annual family income level was greater than $70,000. Three subjects (2.2%) reported not having medical insurance.

Research Questions

Research Question 1

The first research question asked about the extent of use of each of the 15 alternative coping strategies. Data analysis suggested that trying to relax was the most frequently used coping strategy (used by $n = 121$ [89.6%], $M = 2.5$, $mdn = 3.0$), followed by wishing or praying that symptoms would disappear ($n = 114$ [84.4%], $M = 2.6$, $mdn = 3.0$) and telling someone about their symptoms ($n = 101$ [74.8%], $M = 1.2$, $mdn = 1.0$). The frequency of use of each alternative coping strategy is presented in Table 1.

Research Question 2

The second research question examined the relationship between each of the 15 alternative coping strategies and decision delay. The results of the statistical analysis are displayed in Table 2. Spearman's rho revealed that there was a significant positive

Table 1

Extent of Use of Alternative Coping Strategies

Alternative coping strategy	Extent of use N (%)					M/Mdn
	Not at all n (%)	A little n (%)	Moderately n (%)	A lot n (%)	A great deal n (%)	
Wished/prayed symptoms disappear	21 (15.6%)	12 (8.9%)	15 (11.1%)	33 (24.4%)	54 (40%)	2.6/3
Tried to relax	14 (10.4%)	19 (14.1%)	25 (18.5%)	40 (29.6%)	37 (27.4%)	2.5/3
Pretended nothing wrong	63 (46.7%)	17 (12.6%)	26 (19.3%)	18 (13.3%)	11 (8.1%)	1.2/1
Tried not to think about symptoms	56 (41.5%)	22 (16.3%)	24 (17.8%)	23 (17.0%)	10 (7.4%)	1.3/1
Prescription medication	104 (77%)	10 (7.4%)	13 (9.6%)	4 (3.0%)	4 (3.0%)	.5/0
Non-prescription medication	66 (48.9%)	33 (24.4%)	30 (22.2%)	3 (2.2%)	3 (2.2%)	.8/1
Went to bed/rested	70 (51.9%)	31 (23.0%)	16 (11.9%)	9 (6.7%)	9 (6.7%)	.9/0
Home remedies	126 (93.3%)	6 (4.4)	2 (1.5%)	0	1 (.7%)	.1/0
Other home remedies	71 (52.6%)	27 (20%)	22 (16.3%)	13 (9.6%)	2 (1.5%)	.9/0

Table 1 (cont.)

Extent of Use of Alternative Coping Strategies

Alternative coping strategy	Extent of use N (%)					*M/Mdn*
	Not at all n (%)	A little n (%)	Moderately n (%)	A lot n (%)	A great deal n (%)	
Took mind off symptoms	84 (62.2%)	26 (19.3%)	14 (10.4%)	8 (5.9%)	3 (2.2%)	.7/0
Did normal activities	74 (54.8%)	31 (23.0%)	12 (8.9%)	14 (10.4%)	4 (3.0%)	.8/0
Convince self not serious	44 (32.6%)	21 (15.6%)	24 (17.8%)	31 (23.0%)	15 (11.1%)	1.6/2
Convince others not serious	89 (65.9%)	12 (8.9%)	6 (4.4%)	19 (14.1%)	9 (6.7%)	.9/0
Told someone nearby	Nobody 34 (25.2%)	1 person 65 (48.1%)	2 people 17 (12.6%)	3 people 11 (8.1%)	≥ 4 people 8 (5.9%)	1.2/1
Telephoned someone	Nobody 87 (64.4%)	1 person 36 (26.7%)	2 people 8 (5.9%)	3 people 0	≥ 4 people 4 (3.0%)	.5/0

correlation between decision delay and the following coping strategies: telling someone about the symptoms ($r = .20$; $p = .02$), trying not to think about symptoms ($r = .18$; $p = .04$), taking non-prescription medications ($r = .25$; $p < .001$), going to bed/resting ($r = .31$; $p < .01$), trying other home remedies ($r = .21$; $p = .01$), doing something to take his/her mind off of symptoms ($r = .37$, $p < .01$), engaging in normal activities ($r = .32$; $p <$

.01), convincing himself/herself that the problem is not serious (r = .33; p < .01), and convincing others that the problem is not serious (r = .26; p < .001). Decision delay was not associated with wishing/praying symptoms would go away, trying to relax, pretending nothing is wrong, taking prescription medications, calling someone, or taking home remedies (i.e. herbs, hot tea, etc).

Research Questions 3 and 4

The third and fourth research questions asked about the relationships among five demographic variables (i.e. age, income, gender, education and country of residence) with each of the 15 alternative coping strategies and with decision delay. The relationships between coping strategies and the categorical demographic variables are displayed in Table 3, while Table 4 presents the relationships between coping strategies and continuous variables. The findings show that age was negatively correlated with trying not to think about symptoms (r = -.18; p = .03). Income was positively correlated with two coping strategies: going about normal activities (r = .19; p = .03) and trying to convince others that the problem was not serious (r = .21; p = .02) and was negatively associated with taking prescription medication (r = - .17, p = .05). Gender had a significant association with two coping strategies such that males were likely to try to relax (z = -2.48; p = .01) and females were more likely to call someone to discuss symptoms (z = -1.96; p = .05). Regarding country of residence, Canadians were more likely to try not to think about symptoms (z = -2.65; p = .01) and to convince others that the problem is not serious (z = -2.80; p = .01). Level of education was significantly associated with self-treatment with medications. Specifically, those with high school education or less were more likely to take prescription medications (z = -2.24; p = .03),

while those with more than a high school education were more likely to take non-prescription medications ($z = -2.90$; $p < .01$). Decision delay was not associated with age ($r = .03$, $p = .71$), income ($r = .01$, $p = .89$), gender ($z = -.22$, $p = .83$), country of residence ($z = -.65$, $p = .52$), or level of education ($z = -1.32$, $p = .19$).

Table 2

*The Association of Alternative Coping Strategies and Decision Delay**

Alternative coping strategies	r**	p
Wished or prayed symptoms would go away	.05	.60
Tried to relax	.12	.16
Tried to pretend nothing was wrong	.12	.15
Told someone nearby	.20	.02
Tried not to think about my symptoms	.18	.04
Took prescription medication	-.00	.98
Took non-prescription medication	.25	< .001
Telephoned someone to tell them	.05	.59
Went to bed/rested	.31	< .001
Took home remedies	.02	.78
Tried other home remedies	.21	.01
Did something to take my mind off of my symptoms	.37	< .001
Went about my normal activities	.32	< .001
Tried to convince myself the problem was not serious	.33	< .001
Tried to convince others the problem was not serious	.26	< .001

*Decision delay (hrs): M/mdn = 11.8/2.0
**Spearman's r

Table 3

The Association of Age and Income with Alternative Coping Strategies

Alternative Coping Strategies		Age		Income	
	$M \pm SD$	$r*$	p	$r*$	p
1.Wished or prayed symptoms would go away	2.6±1.5	.09	.32	-.16	.07
2.Tried to relax	2.5±1.3	-.12	.16	-.02	.81
3.Tried to pretend nothing was wrong	1.2±1.4	-.12	.18	-.01	.90
4.Told someone nearby	1.2±1.1	-.11	.20	-.02	.78
5.Tried not to think about my symptoms	1.3±1.4	-.18	.03	.12	.16
6.Took prescription medication	.5±1	.10	.25	-.17	.05
7.Took non-prescription medication	.8±1	-.08	.39	.04	.63
8.Called someone to tell them	.5±.9	.12	.16	-.03	.70
9.Went to bed/rested	.9±1.2	-.06	.52	-.09	.28
10.Took home remedies	.1±.5	.13	.12	-.10	.27
11.Tried other home remedies	.9±1.1	-.11	.22	.08	.37
12.Did something to take mind off symptoms	.7±1.0	-.05	.57	.04	.69
13.Went about normal activities	.8±1.1	-.15	.09	.19	.03
14.Tried to convince self problem not serious	1.6±1.4	-.15	.08	.01	.90
15.Tried to convince others problem not serious	.9±1.4	-.14	.10	.21	.02

*Spearman's r

Table 4

Associations of Gender, Country of Residence, and Education with Alternative Coping Strategies

Coping strategies*	Gender				Country				Education			
	M/Mdn		z	p	M/Mdn		z	p	M/Mdn		z	p
	Male	Female			USA	Canada			≤ HS♦	> HS♦		
1.	2.7/3	2.6/3	-.08	.94	2.7/3	2.6/3	-.24	.81	2.7/3	2.6/3	-.52	.60
2.	2.7/3	2/2	-2.48	.01	2.6/3	2.5/3	-.65	.51	2.5/3	2.5/3	-.36	.72
3.	1.2/1	1.3/1	-.55	.59	1.1/1	1.3/1	-.76	.44	1.2/1	1.4/1	-.83	.41
4.	1.2/1	1.2/1	-.62	.54	1.1/1	1.3/1	-.68	.49	1.2/1	1.3/1	-.57	.57
5.	1.3/1	1.5/1.5	-.88	.38	.8/0	1.5/1.5	-2.65	.01	1.3/1	1.4/1	-.70	.49
6.	.4/0	.7/0	-1.55	.12	.3/0	.5/.0	-.96	.33	.6/0	0.2/0	-2.24	.03
7.	.9/1	.8/.5	-.12	.91	.8/0	.85/1.0	-.76	.44	.7/0	1.2/1	-2.90	< .001
8.	.4/0	.7/0	-1.96	.05	.5/0	.51/.00	-.18	.86	.6/0	.4/0	-1.25	.21
9.	1/0	.9/0	-.28	.78	.7/.0	1/1.7	-.33	.19	1.0/.5	0.9/0	-.73	.47
10.	.1/0	.1/0	-.40	.69	0	.1/0	-1.83	.07	.1/0	0.1/0	-.38	.70

Table 4 (cont.)

Associations of Gender, Country of Residence, and Education with Alternative Coping Strategies

Coping strategies*	Gender				Country				Education			
	M/Mdn		*z*	*p*	*M/Mdn*		*z*	*p*	*M/Mdn*		*z*	*p*
	Male	Female			USA	Canada			≤ HS♦	> HS♦		
11.	.9/0	.8/0	-.29	.78	.7/0	.9/1.2	-1.15	.25	.8/0	1.0/0	-.39	.70
12.	.6/0	.9/0	-1.12	.26	.6/0	.7/0	-.78	.44	.7/0	.6/0	-.92	.36
13.	.9/0	.8/0	-.51	.61	.9/0	0.8/0	-.72	.86	.7/0	1/0	-1.14	.26
14.	1.7/2	1.6/1	-.41	.69	1.4/2	1.7/2	-1.04	.30	1.6/1.5	1.7/2	-.46	.65
15.	.9/0	.9/0	-.74	.46	.4/0	1/0	-2.80	.01	.7/0	1.1/0	-1.47	.14

z Mann-Whitney statistics
♦High School
* See Appendix A for the names of alternative coping strategies

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

This study examined the frequency of use of 15 coping strategies and the relationships that these strategies have with AMI decision delay and five demographic variables in a sample of 135 AMI patients. This was the first study to: (a) examine AMI decision delay within the context of a conceptual model (i.e. AMI Care-Seeking Model) that is specific to the AMI experience, and (b) examine the relationship between coping strategies and demographic characteristics. The findings suggested that nine of the 15 coping strategies were associated with longer decision delay. Of the demographic variables, age was associated with trying not to think about symptoms. Education, gender, and country of residence were each associated with two different coping strategies. Income was associated with three coping strategies. None of the demographic variables were associated with decision delay.

The following text provides a discussion of the study findings within the context of existing literature. Implications and recommendations for practice, theory and research, as well as a summary of the study's limitations are also addressed. It is important to re-emphasize that this study examined decision delay as the outcome variable because it sought to examine delay that could be uniquely attributed to patients. However, the outcome variable in several of the studies discussed in the following text was pre-hospital delay, of which decision delay is a component. Thus, caution must be used when interpreting the results of the current study in relation to those of others that examined factors contributing to pre-hospital delay.

Research Questions 1 and 2

The first and second research questions ask about the frequency of use of each alternative coping strategy, and the relationship between the extent of use of each coping strategy and decision delay. The findings suggested that the three most frequently employed coping strategies were trying to relax, wishing or praying that symptoms would disappear, and telling someone about his/her symptoms. These findings were consistent with others (Dracup and Moser, 1997; Leslie et al., 2000; McKinley et al., 2000) who found that these three strategies were the most frequent *initial* responses to AMI symptoms.

The AMI symptom experience is generally an anxiety-provoking event. Hence, it is not surprising that trying to relax was the most frequently used coping strategy in this study. Efforts to relax may be reflective of two processes. First, they may be reflective of participants' attempts to clear their minds to facilitate accurate appraisal of their situations. Second, participants may have believed that stress and anxiety were contributing to their symptom experience, and may have therefore tried to relax in effort to resolve their symptoms.

Wishing or praying that symptoms would disappear was the second most frequent coping response used by the study participants. Rosenfeld et al. (2005) found that some of the participants who hoped their symptoms would disappear did not attribute them to the heart. Two other studies (Kentsch et al., 2002; Pattenden et al., 2002) reported that some patients illogically hoped that symptoms would disappear despite knowing that they were experiencing a heart attack. Pattenden et al. described one participant who indicated that

"it is difficult to admit that you have an illness that might kill you". Individuals often resort to prayer when found in circumstances beyond their control (Cotton et al., 2006).

Despite the fact that trying to relax and/or wishing/praying that the symptoms would disappear were frequently used by the study participants, this high frequency of use was not associated with longer decision delay. Therefore, it is possible that participants mentally engaged in these coping strategies while simultaneously engaging in other coping strategies. It is also possible that individuals use these coping strategies for short time periods. Given that the associations of decision delay with relaxing and wishful thinking or prayer are not well established in the literature, it is prudent that they be further investigated in future research.

Participants in this study frequently told others about their symptoms prior to making a decision to seek medical care. Although this study operationalized this variable somewhat different, the findings are consistent with those of other studies that investigated who (i.e., spouse, friend, physician, etc.) participants spoke with. Two studies (Alonzo et al., 1986; Johnasson et al., 2004) reported that participants frequently contacted their spouses to discuss symptoms. Leslie et al. (2000) reported that individuals frequently called a general practitioner because they believed their symptoms were not important enough to call an ambulance.

The results of this study suggest that decision delay was longer among those who told more people about their symptoms. This is believed to be the first study to examine the extent to which participants consulted with others by quantifying the number of individuals with whom they consulted. However, the results are consistent with those of studies (Alonzo; Ell et al., 1994, McKinley et al., 2000) that found that telling others

(versus not telling others) about their symptoms was associated with longer decision delay. In contrast, four other quantitative studies (Alonzo; Bleeker et al., 1995; Kentsch et al., 2002; Perry et al., 2001) and one qualitative study (Finnegan et al., 2000) found that consulting with a layperson led to a shorter delay time, while a sixth study (Johansson et al., 2004) did not find an association between these two variables. Given the conflicting findings among studies and the varying approaches to measuring the variable "telling others about AMI symptoms," further research is warranted. Such studies should specify who AMI patients consulted with, and the extent to which individuals consulted with others.

<center>*Minimizing Symptoms*</center>

More than half of the participants rated the extent to which they tried to convince themselves that their symptoms were not serious as "moderate" or higher. A lesser percentage (34.1%) tried to convince others that the problem was not serious. Both of these coping strategies were associated with longer decision delay. Because these two coping responses were not examined in previous research, they cannot be discussed within the context of previous literature. However, they appear to be reflective of denial, a form of emotion-focused coping, which was found to be associated with increased decision delay (O'Carroll et al., 2001).

Study participants reported minimal use of four coping strategies: trying not to think about symptoms, doing something to take their mind off of symptoms, pretending that nothing is wrong, and engaging in normal activities. These strategies appear to involve efforts to ignore the existence of symptoms or to minimize their significance. Although not used extensively by the study participants, all except "pretending that

nothing is wrong" were associated with longer decision delay. Despite their infrequent use, these coping strategies may prevent individuals from admitting that they may be suffering from a serious illness, hence leading to longer decision delay. In fact, other studies (Bleeker et al., 1995; Kentsch et al., 2002; O'Carroll et al., 2001) suggested that engaging in various distractive activities may keep one's mind occupied, and may thus prevent individuals from directly confronting the situation.

Efforts to Resolve Symptoms

Despite the fact that participants reported minimal use of three coping strategies that reflect efforts to alleviate or resolve their symptoms, these coping methods were significantly associated with longer delay. The associations between self-treatment efforts and decision delay are not surprising. As Alonzo (1986) pointed out, efforts to resolve symptoms are time consuming because individuals will typically wait to evaluate their effectiveness.

One response to symptoms that may be indicative of attempts to alleviate symptoms was going to bed/resting. Consistent with the finding that going to bed or resting was associated with longer decision delay, Alonzo (1986) found that individuals who reduced their activity experienced delays in seeking medical care. Four qualitative studies (Finnegan et al., 2000; Pattenden et al., 2002; Rosenfeld et al., 2005; Ruston et al., 1998) also reported that patients rested while waiting for symptoms to disappear, which prolonged seeking care.

Self-medication

Although taking non-prescription medication was associated with greater decision delay, taking prescription medication was not. No other research was found that

examined taking prescription medication and non-prescription medication as separate coping strategies. Instead, previous studies included these two strategies within the context of a single variable (self-treatment or self-medication). Five of these (Ell et al., 1994; Kentsch et al., 2002; McKinley et al., 2000; Perry et al., 2001; Zerwic et al., 2003) reported that self-treatment was associated with increased decision delay, while another (Johansson et al., 2004) reported no relationship between self-treatment and delay. The finding that decision delay was associated with taking non-prescription medication, but not with prescription medications may be related to differences in the effect intervals of the prescription and non-prescription medications used by the participants. Although it cannot be confirmed, it is quite possible that the prescription medications taken by participants were primarily nitrates (i.e. nitroglycerin), which are commonly prescribed for patients with pre-existing coronary artery disease. Patients are generally taught to take a maximum of three doses of nitroglycerin over a 15-minute time frame if ischemic symptoms occur. If symptoms are not relieved after three doses (i.e. 15 minutes), patients are advised to seek emergency care. In contrast, non-prescription medications are likely to have effect intervals that are longer than 15 minutes. For example, those who take acetaminophen or aspirin for their analgesic effect are likely to wait more than 15 minutes to evaluate their effectiveness. Thus, it is likely that the effect interval associated with prescription medications was not sufficiently long to have a significant impact on decision delay, while this was not the case with the effect intervals associated with non-prescription medications.

Home remedies

The findings suggested no association between taking home remedies (i.e. herbs, hot tea, hot toddy, etc.) and decision delay. Contrary to this finding, Alonzo (1986) reported that taking home remedies was associated with longer decision delay. The reasons for these conflicting results are not clear, but it is possible that Alonzo's findings were influenced by the use of a larger sample ($N = 1102$), which would allow detection of a smaller effect. Qualitative studies have reported conflicting results. Rosenfeld et al. (2005) found that participants with the longest delays took home remedies, while Ruston et al. (1998) reported that non-delayers took home remedies while they were evaluating their situation. Given that qualitative studies report findings based on anecdotal reports of a limited number of participants, it is difficult to draw conclusion and/or make generalizations based on those reports. Therefore, further research is needed to understand the role of taking home remedies in decision delay.

Unlike taking home remedies, the findings suggested that "trying 'other' home remedies" such as moving about or changing position was found to be associated with increased delay in this study. Given that this relationship was not examined in previous research, it cannot be compared with the literature. Hence this relationship should be further investigated in future research.

<div align="center">Research Questions 3 and 4</div>

The third and fourth research questions examined the relationships between five demographic variables (i.e. age, gender, country of residence, income and education) and 15 alternative coping strategies. Decision delay was not related to any of the demographic variables examined. Studies in the literature reported conflicting results. Eight studies

reported that age and gender were not related to delay (Bleeker et al., 1995; Ell et al., 1994; Horne et al., 2000; Johansson et al., 2004; McKinley et al., 2004; O'Carroll et al., 2001; Perry et al., 2001; Zerwic et al., 2003), three studies found that older age and female gender were associated with longer delay (Goldberg et al., 1999; McGinn et al., 2005; Sheifer et al., 2000), while six studies presented mixed results (Alonzo, 1986; Goldberg et al., 2000; Goldberg et al., 2002; Leslie et al., 2000; Meischke et al., 1993; Yarzebski et al., 1994). Five studies found that lower income was associated with longer delay (Dracup & Moser, 1997; McKinley et al., 2000; Sheifer et al.; Wu et al., 2004; Zerwic et al.), while three studies reported no relationship between income and delay (Bleeker et al.; Ell et al.; Horne et al.). Six studies (Dracup & Moser; Ell et al.; Horne et al.; Johansson et al.; McKinley et al.; Zerwic et al.) reported that level of education was not associated with delay while one study (Wu et al.) found that lower level of education was associated with longer delay.

The results revealed that older individuals were less likely to try not to think about their symptoms. Although this specific relationship has not been examined in previous research, the literature offers some explanations for this finding. Ryan & Zerwic (2003) reported that older individuals tend to perceive themselves at greater risk of developing a heart attack and that they regard heart disease as life-threatening. Thus, the presence of AMI symptoms may have prompted the elderly to pay more attention to their symptoms. However, the greater tendency to think about symptoms does not suggest that the elderly were more likely to interpret their symptoms accurately. In fact, previous studies suggest that the elderly have a greater tendency to attribute their AMI symptoms to non-cardiac causes such as co-morbidities (Dracup & Moser, 1997) or aging (Keller et

al., 1989). However, symptom severity and duration were reported to prompt the elderly to seek urgent medical care (Ryan & Zerwic).

In this study, females were more likely than males to telephone someone to discuss their symptoms. Although no previous reports have examined this relationship, Leslie et al. (2000) reported that women were more likely than men to call a general practitioner and discuss their symptoms. The tendency for women to consult more with others may be due in part to a greater tendency for women to present with atypical AMI symptoms (Grace et al., 2003). In attempts to understand the origin of their symptoms, women may be more likely to gather information about the possible cause(s) of symptoms and to seek the advice of others in interpreting their symptoms. In fact, Rosenfeld et al. (2005) reported that confusion regarding their understanding of the origin of symptoms sometimes prompted women to call someone to discuss their symptoms. Finnegan et al's (2000) qualitative study reported that all of their female participants discussed their symptoms with someone. This finding may also be related to a general tendency among women, in comparison to men, to discuss their problems with others (Arnold & Boggs, 1999). The study findings also suggest that males were more likely than females to respond to their AMI symptoms with attempts to relax. Unfortunately, previous research concerning these relationships could not be found.

Country of residence was significantly associated with two coping strategies. Canadians were more likely than Americans to try not to think about symptoms and to try to convince others that the problem is not serious. These findings cannot be discussed within the context of previous research, as this is believed to be the first study to examine

this relationship. Further research is needed to validate the findings concerning country of residence.

Education was associated with the extent to which participants took prescription and non-prescription medication. Specifically, individuals with greater than high school education were more likely to take non-prescription medication, while those with a high school education or less were more likely to take prescription medication. These findings may be related to the fact that the less educated individuals in this sample were more likely to have suffered a previous AMI (Fox-Wasylyshyn, El-Masri & Krohn, 2007). Given that the less educated were more likely to have a cardiac history, these individuals were also more likely to be on prescription medications, and to have received instructions to take them for ischemic symptoms. This may explain why individuals with a lower education were more likely to take prescription drugs. Likewise, given that individuals with an education greater than high school were less likely to have a cardiac history, they were more likely to take non-prescription drugs in response to AMI symptoms.

Participants with higher incomes were more likely to continue with normal activities and to try to convince others that the problem is not serious and were less likely to take prescription medication. Because this is believed to be the first study to examine these relationships, further research is needed to validate these findings. However, it is possible that commitment to work responsibilities that frequently come with autonomous/professional jobs may have led to delayed decisions to seek care.

Implications and Recommendations

Practice

Coping Strategies

This study provides information pertaining to the extent of use of specific coping strategies that are utilized by AMI patients and the demographic characteristics that are associated with these strategies. Most important, this study provides information regarding which coping strategies are likely to contribute to delay in seeking treatment for AMI. Nursing interventions aimed at reducing decision delay should be directed towards educating individuals to recognize and minimize their use of coping strategies that are likely to lead to decision delay. It is hoped that doing so will maximize individuals' chances for obtaining timely life-saving treatment.

The findings suggested that several commonly used coping strategies that appear to be reflective of emotion-focused coping were associated with greater delay: trying not to think about symptoms, trying to convince self and others that the problem was not serious, doing something to take one's mind off of symptoms and continuing normal activities. Thus, teaching messages aimed at reducing delay should focus specifically on reducing individuals' use of these coping strategies. For example, individuals should be taught that when experiencing unusual symptoms, they should investigate them instead of ignoring them and continuing normal activities. Such messages should seek to increase the public's awareness of the tendency to engage in these detrimental coping strategies when experiencing AMI. Increased awareness may serve to enhance individuals' recognition of these coping methods in oneself or others, which may subsequently result in termination or minimization of their use.

Several coping strategies aimed at ameliorating symptoms were found to be associated with greater delay in seeking treatment. These included taking non-prescription medications, trying other home remedies, and going to bed/resting. Unfortunately, individuals may engage in these coping strategies until they realize that their personal interventions have not ameliorated symptoms, and thus they experience delays. Therefore, individuals should be taught that their first action when experiencing AMI symptoms should be to call the ambulance rather than engaging in time-consuming self-treatment strategies.

Given that this study found an association between decision delay and the number of people that AMI patients tell about their symptoms, it is important to teach individuals that discussing symptoms with multiple others may prevent timely administration of AMI treatment. Persons should be taught to develop a plan in case they experience AMI symptoms and to share this plan with those around him/her. Planning ahead for a traumatic event such as AMI can help decrease anxiety and allow for better coping if AMI does occur (Alonzo & Reynolds, 1997). Therefore, it is important that physicians also educate their at-risk patients about the use of coping strategies in general and how these delay patients from receiving much-needed treatment. Health professionals working in cardiac rehabilitation centers and acute care hospitals have the opportunity to get acquainted with patients and thus they can provide individually tailored AMI education.

In general, it is important that nurses and other health professionals be aware of the specific coping strategies that are associated with delay in deciding to seek medical care for AMI symptoms so that they can incorporate relevant content in patient and public educational programs. However, it is also important that the factors that contribute to the

use of these coping strategies also be identified. For example, use of some of the coping strategies identified above (e.g. going about normal activities, convincing self or others that symptoms are not serious) may be indicative of denial, or they may simply indicate confusion about the meaning and significance of the symptoms due to lack of knowledge about the many ways in which AMI may manifest. If this proves to be the case, educational messages that carry information regarding atypical AMI symptoms, and about the variations in which AMI symptoms may present and progress may be helpful in reducing the use of several of the coping strategies that were found to be associated with decision delay in this study.

Demographic Factors

In this study, the elderly had a greater tendency to think about their symptoms, but age was not associated with decision delay. Given that the younger patients were less likely to think about their symptoms, this may imply a need to educate them about AMI symptoms and coping strategies used to deal with the symptoms. Income was associated with three coping strategies and country of residence was associated with two coping strategies that involved ignoring or minimizing the existence of AMI symptoms. However given that this is the first study to investigate these relationships, it would be premature to target educational messages at individuals of certain income levels or a certain country of residence. Further research is needed to clarify the relationships between alternative coping strategies and income and country of residence. The results also suggested that people with an education greater than high school were more likely to take non-prescription medication, while individuals with a high school education or less were more likely to take prescription medication. However, given the potential

confounding of education level with history of AMI, further research is needed before recommendations can be made to target such messages toward individuals of specific educational levels.

Theory and Research

This study tested a portion of the AMI Care-Seeking Model (Fox-Wasylyshyn, 2005), which pertained to the relationships between alternative coping strategies and decision delay. The results of this study add to the findings of the original study to the extent that it demonstrated that coping strategies other than those reflective of emotion-focused coping were associated with decision delay. Five coping strategies that appear to be indicative of problem-focused coping were associated with increased decision delay.

This was the first study to investigate the relationship between demographics and specific coping strategies. The results need to be further validated before they can be used to prescribe practice. Future studies need to incorporate larger and more diverse samples to understand the role that demographic characteristics might play within the AMI Care-Seeking Model. For example, further research is needed to investigate the differences in coping strategies between Americans and Canadians. The association of income with two coping strategies that appear to be reflective of emotion-focused coping also needs to be further investigated in research.

Intervention studies examining the usefulness of the results of this study in guiding clinical interventions aimed at reducing decision delay among future AMI patients are also recommended. A randomized control trial could be implemented with at-risk patients to test the effect of teaching about the use of various coping strategies and how to minimize or avoid their use. Future research also needs to investigate the

relationship between knowledge of AMI symptoms and use of coping strategies. If such a relationship would exist, it would point to lack of knowledge as the reason for individuals' use of coping strategies.

In light of the fact that participants who discussed symptoms with someone were more likely to delay, a qualitative study could be performed with the spouses/partners of at-risk patients to find out what advice they would give to the patients in the event that someone they knew was experiencing selected symptoms that are associated with AMI. A retrospective study correlating decision delay and advice given by others to AMI patients would also prove useful. Such studies could provide insight regarding the knowledge gaps of the spouses/partners so that they can be thoroughly addressed by nursing interventions. Further research could also qualitatively investigate why patients did or did not use specific coping strategies. This could provide better explanations to the findings of this study.

Although the current study examined the use of prescription medications, it did not differentiate between nitrates and other prescription medication. It would be useful in future research to differentiate between cardiac and non-cardiac prescription drugs taken, as this may provide insight into the patients' hypotheses of symptom origin and the order in which they test out these hypotheses. Further research is also needed to gain a better understanding of the relationship between level of education and use of prescription medication.

Limitations

Although measures were taken to facilitate recall (Fox-Wasylyshyn, 2005), the retrospective design used in the original study required participants to discuss past events,

which can pose issues of recall bias and inaccuracy of data. Another limitation pertaining to the design was the observational nature of the original study. The observational feature of the design refers to the lack of manipulation or control of the outcome variable (Munro, 2001). Therefore, cause and effect relationships cannot be inferred from the results of this study.

Several populations were under-represented in the sample. Despite efforts to achieve racial and socioeconomic diversity in the original study (Fox-Wasylyshyn, 2005), the sample was mainly comprised of Non-Hispanic Whites who were medically insured. In addition, many patients who were physiologically unstable could not participate in the study because they often became stable after the period of eligibility to participate (i.e. 24 to 96 hours after hospitalization) had expired. In addition, individuals who did not seek treatment for their AMI or who died before arriving at a hospital could not be accessed for inclusion into the study.

In secondary analyses, research is limited by the data that were collected in the original study. For example, the original 15-item questionnaire (Fox-Wasylyshyn, 2005) included items that asked participants about the extent to which they talked to others about their symptom experiences. However, several studies have found an association between AMI delay and contacting a physician (Alonzo, 1986; Ell et al., 1994; Johansson et al., 2004) or a layperson (Alonzo; Kentsch et al., 2002; Johansson et al.). Therefore, it might be useful to include contacting a physician and contacting a layperson as distinct coping strategies. In addition, when using secondary data, the researcher has to rely on the quality control measures reported by the primary source of data.

Conclusion

This study was developed to enhance knowledge regarding the process of decision delay when experiencing AMI symptoms. Fifteen alternative coping strategies were investigated in relation to decision delay and demographic characteristics. The results provide health professionals with significant information that can be used as part of community or individualized teaching plans for AMI patients. Considering the relatively homogeneous nature of the study sample, further research is needed before the results can be generalized to other populations. Suggestions are given for further research studies that can add a greater understanding in the area of AMI and coping strategies. By aiming to reduce the use of coping strategies and therefore decision delay, individuals will have better opportunities for survival and post-AMI recovery.

Appendix A

Items Used to Measure Alternative Coping Strategies

ID Code: _____

Please indicate the extent to which you did each of the following in response to your symptoms

♣1. Wished or prayed that they would go away

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

♣2. Tried to relax

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

*3. Tried to pretend nothing was wrong

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

♦4. Told someone nearby

0	1	2	3	4
told no one	told 1 person	told 2 people	told 3 people	told 4 or more

*5. Tried not to think about my symptoms

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

♦6. Took prescription medication (nitroglycerine, heart medicine, stomach medicine, etc.)

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

♦7. Took non-prescription medication (antacid, aspirin, acetaminophen, etc.)

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

◆8. Telephoned someone to tell them

0	1	2	3	4
Telephoned nobody	Telephoned 1 person	Telephoned 2 people	Telephoned 3 people	Telephoned 4 or more

◆9. Went to bed/rested

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

◆10. Took home remedies (herbs, hot tea, hot toddy, etc.)

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

◆11. Tried other home remedies (changing position, walking around)

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

◆12. Did something to take my mind off of my symptoms (watched TV, read a book, etc.)

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

◆13. Went about my normal activities

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

*14. Tried to convince myself the problem was not serious

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

*15. Tried to convince others that the problem was not serious

0	1	2	3	4
not at all	a little	moderately	a lot	a great deal

◆Items appear to be reflective of emotion-focused coping (not supported by psychometric testing)
*Items supported by psychometric testing to reflect emotion-focused coping

♦Items appear to be reflective of problem-focused coping (not supported by psychometric testing)

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VITA AUCTORIS

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