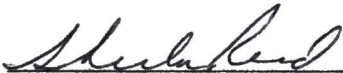Borski, Catherine A., <u>Gender Differences: Making the decision to seek treatment for symptoms of acute myocardial infarction.</u> Masters of Public Health (Health Behavior), May, 2000, 57 pp., reference list, 37 titles.

The purpose of this study was to investigate the problem: Do differences in interpretation and response to symptoms of AMI account for additional delay in seeking treatment in women compared with men? The sample consisted of 50 (21 women, 29 men) post-myocardial infarction patients in a large, non-profit, teaching hospital in central Texas. Participants were interviewed within 72 hours of admission using the Revised Response to Symptoms questionnaire. In this study, it was found that there was a statistically significant difference between the cognitive and emotional processes that men and women use when making the decision to seek treatment for symptoms of AMI.

GENDER DIFFERENCES: MAKING THE DECISION

TO SEEK TREATMENT FOR SYMPTOMS OF

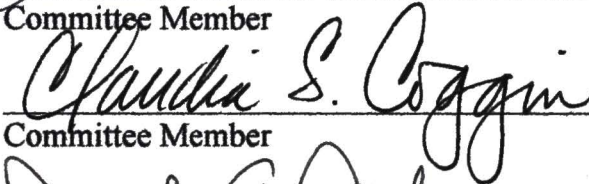# ACUTE MYOCARDIAL INFARCTION

Catherine A. Borski, B.S.

APPROVED:

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Major Professor

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Committee Member

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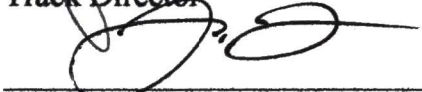
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GENDER DIFFERENCES: MAKING THE DECISION

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ACUTE MYOCARDIAL INFARCTION

THESIS

Presented to the School of Public Health

University of North Texas
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in Partial Fulfillment of the Requirements

For the Degree of

Master of Public Health

By

Catherine A. Borski, B.S.

Fort Worth, Texas

May 2000

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This thesis is dedicated to the four most important people in my life, my parents, Mr. & Mrs. Floyd Borski, my sister, Janet Briscoe, and my brother, Stephen Borski. They were not only my parents and my siblings, but my best friends who provided love, support and encouragement to achieve my best. Their belief in me has never wavered, even when my own faltered.

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Thanks to family, friends, and faith, I finally made it.

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CHAPTER 1

INTRODUCTION

Heart disease is the leading cause of death for both men and women in the United States. Approximately 250,000 people a year die of acute myocardial infarction (AMI) within one hour of the onset of symptoms and before they reach a hospital (American Heart Association, 1995). Morbidity and mortality from AMI are determined by the extent of myocardial damage (Leitch, Birbara, Freedman, Wilcox, & Harris, 1989). To reduce the mortality from AMI, early presentation to medical care is essential (Dempsey, Dracup, & Moser, 1995). During an evolving AMI a critical determinant of survival and preservation of the myocardium is the interval between the onset of symptoms and initiation of medical therapy (Kenyon, Ketter, Gheorghiade, & Goldstein, 1991; Weilgosz, Nolan, Earp, & Biro, 1988). Delay in seeking health care for symptoms of AMI contributes to an increase in short and long term morbidity and mortality because of the decreased opportunity for the use of thrombolytic therapy and additional medical and surgical therapies.

Thrombolytic agents are designed to restore blood flow to ischemic myocardium, limit infarct size, preserve left ventricular function, and dramatically reduce mortality and morbidity in AMI. However, a large number of patients are ineligible for thrombolytic therapy, due to their delay in seeking treatment for their symptoms (Dracup

& Moser, 1991; Johnson & King, 1995). A 51% reduction in infarction size has been documented in patients admitted within one hour following symptom onset, 31% in patients admitted one to two hours following symptom onset, and 13% in patients admitted more than two hours following the onset of symptoms (Simoons, van den Brand, De Zwaans, Verheugt, Remme, Seruys, Bars, Res, Krauss, Vermer, & Lubsen, 1985). Thrombolytic agents are relatively ineffective when more than six hours have passed (Dracup & Moser, 1991; Johnson & King, 1995). The efficacy of early medical therapy in AMI provides compelling evidence for the prompt initiation of health care seeking behavior.

During the past three decades a number of researchers have investigated the phenomenon of delay in seeking health care for the symptoms of AMI. Delay time is defined as the amount of time that elapses from the first awareness of symptoms to the initiation of definitive treatment in the hospital. Mean and median delay times over the past three decades have been reported from 4.6 hours to 24 hours, and 2 hours to 6.4 hours respectively (Dracup & Moser, 1991). In a recent study examining temporal and recent trends (June 1, 1994, to October 31, 1997) in delay time after AMI, the mean delay times were 5.7 hours in 1994 and 5.5 hours in 1997. The median delay time was 2.1 hours in 1994 and 1997. Participants of this large study (N=364,131) were included in the Second National Registry of Myocardial Infarction (NRMI). The NRMI is a cross-sectional observational database of patients hospitalized with AMI. This database has been implemented since 1990 and is a voluntary registry sponsored by Genentech, Inc.,

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San Francisco, California.(Goldberg, Gurwitz, & Gore, 1999). An alternative way of looking at this data is that 26% to 44% of individuals with symptoms of AMI delay longer than 4 hours prior to seeking health care (Reilly, Dracup, & Dattolo, 1994). Despite efforts to reduce delay times, over the past three decades, it is clear that prehospital delay remains a substantial problem.

In order to better understand delay, perhaps it is helpful to look at the different aspects or phases of delay. Delay time can be divided into three phases commonly recognized by researchers: the decision phase defined as the time from symptoms onset to decision to seek medical care, the transit phase defined as the time spent traveling to the hospital, and the emergency room (ER) phase defined as the time from arrival in the ER to definitive medical treatment (Reilly, Dracup, & Dattolo, 1994). Although delay can occur in any one of these three phases, the major component of delay in seeking treatment for symptoms of AMI is the decision phase (Leitch, et al., 1989). Reduction in the decision phase of delay increases the opportunity for limiting infarct size through the use of thrombolytic therapy. For this reduction in the decision phase to occur, it is important to understand the factors that contribute to delay in seeking treatment.

Previous research has examined extensively the sociodemographic, clinical, and environmental factors associated with delay. The following are known patient characteristics predictive of increased delay times: elderly, African American, lower socioeconomic status, and a history of hypertension, congestive heart failure (CHF), diabetes, or angina (Alonzo, 1986; Clark, Bellam, Shah, & Feldman, 1992; Ghali,

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Cooper, Kowatly, & Liao, 1993; Hackett, & Cassem, 1969; Meischke, Eisenberg, & Larsen, 1992; Schroeder, Lamb, & Hu, 1978; Simon, Feinleib, & Thompson, 1972; Turi, et al., 1986). Individuals experiencing a second or third AMI have delay times similar to those of individuals having a first AMI, therefore past experience of MI does not reduce delay time (Schroeder, Lamb, & Hu, 1978; Turi, et al., 1986). Consultation with a coworker or friend decreases delay time, whereas consultation with one's spouse or physician increases delay (Alonzo, 1986; Hackett, & Cassem, 1969). Previous research also has determined that individuals with low somatic awareness are likely to delay more (Kenyon, Ketter, Gheorghiade, et al., 1991).

However, most researchers have not included gender as a variable in their study of factors contributing to delay, despite the fact that coronary artery disease kills as many women as men. More than half a million women die from cardiovascular disease each year, accounting for approximately forty-five percent of all female deaths in the United States. That is more than all forms of cancer combined (American Heart Association, 1997). Post myocardial infarction morbidity and mortality are higher for women compared to men (Cooper, Simmons, Castaner, Prasad, Franklin, & Ferlinz, 1986; Fiebach, Viscoli, & Horwitz, 1990; Lerner & Kannel, 1986; Stokes, Kannel, Wolf, Cupplees, & E'Agostino, 1987). For example, the one year mortality for women following AMI is 39% as compared to 31% for men (American Heart Association, 1990). The statistics are even worse among minority women. African-American women have a substantially higher mortality from coronary heart disease (CHD) than white women and

a higher in-hospital mortality from MI than even African-American men (American Heart Association, 1990), suggesting minority women are especially vulnerable to the negative outcomes of delay in seeking treatment (Moser, & Dracup, 1993)

Given the lack of research regarding gender, a debate continues among researchers as to the influence of gender in health care seeking behavior for the symptoms of AMI. Some researchers have reported no gender differences in delay (Schroeder, Lamb, & Hu, 1978; Simon, Fienleib, & Thompson, 1972; Weilgosz, et al., 1988). However, the study participants in which no significant gender differences in delay were reported, typically had a mean age of less than 65. Women are typically older than 65 when they suffer AMI. The average age for diagnosis of coronary artery disease (CAD) is 72.5 years in women and 62.8 years in men (Jensen & King, 1997). Thus these investigations may not accurately represent delay in treatment seeking behavior among women with symptoms of AMI. The underreepresentation of older individuals in research studies clearly results in the disproportionate exclusion of women. Additionally, because of the underrepresentation of women in clinical trials, few comparisons of delay have been made between women and men.

However, in those studies in which comparisons between men and women were made, most reported no significant differences in delay times between men and women. Although the differences in delay times between men and women were not statistically significant, they were considered clinically significant. For example, Hackett and Cassem (1969) studied 64 men and 24 women admitted to a coronary care unit with

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symptoms of AMI and found no statistical difference in delay time. However, closer examination of the findings revealed that women delayed 1.5 hours longer than men, with a documented median delay time of 5 hours for women. Initiating treatment seeking behavior 5 hours following symptom onset clearly hinders the opportunity for reduction in infarct size, morbidity, and mortality with the use of thrombolytic therapy. This is not surprising, because the viability of myocardium after coronary occlusion is limited and dependent on both duration and severity of ischemia.

Of those researchers who have found any gender differences between men and women in delay times, all concluded that women delay longer than men (Alonzo, 1986; Moss, Wynar, & Goldstein, 1969; Shcmidt & Borsch, 1990; Turi, et al., 1986). For example, Moss, Wynar, & Goldstein (1969) reported that the interval between the onset of symptoms and the decision to seek treatment was 350 minutes for women and 150 minutes for men. Alonzo (1986) reported an increased median delay time of 47 minutes for women. This delay occurred between the onset of symptoms and lay consultation, and primarily was due to a longer self-evaluation phase. In 1986 Turi and associates reported that women delayed significantly longer than men, with a documented mean delay time of 3.2 hours for women as compared to 3.0 hours for men. Although mean time for treatment was only 0.2 hours longer for women as compared to men, 31% of the women in their study delayed longer than 5 hours. In a sample of 126 patients (94 men and 34 women) with AMI, Schmidt and Borsch (1990) evaluated factors affecting the interval between symptom onset and hospital arrival. Female gender was identified as an

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independent predictor of prolonged delay, with half the women reported to delay longer than 6 hours in coming to the hospital. While only 13% of the men were reported to delay longer then 6 hours. This increased delay time was thought to be due primarily to a longer decision phase among women compared to men (Alonzo, 1986).

To understand delay, prior researchers have focused on sociodemographic and clinical characteristics of patients (Dracup & Moser, 1997). Identifying patient characteristics predictive of increased delay has allowed for identification of high risk populations to which interventions have been targeted. However, in spite of continuing public education campaigns about signs and symptoms of a heart attack and early thrombolysis, only marginal improvements have been made in reducing delay time (Leitch, Birbara, Freedman, Wilcox, & Harris, 1989). Therefore, recent research suggests that simply identifying the sociodemographic, clinical/health history, and environmental factors associated with or affecting delay is not enough. Other factors may be more important for complete understanding of the phenomenon of treatment seeking delay. These factors include the nature and appraisal of symptoms, the social context in which symptoms occur, and cognitive and emotional processes used by patients to interpret and respond to symptoms (Dracup & Moser, 1997).

Some important questions exist concerning the perception of symptoms among women with symptoms of AMI and health care seeking behavior: 1) What are the course and characteristics of symptoms?, 2) How do women perceive and interpret cardiac

symptoms? (Moser & Dracup, 1993), and 3) How do psychosocial processes affect the perception of symptoms and seeking of health care?

The typical presentation in AMI may be described as sudden, severe, crushing or squeezing pericardial pain with or without radiation to the jaw and one or both arms. Silent or unrecognized myocardial infarctions (MI) occur more frequently in women than men. This increased frequency of unrecognized MI's in women suggests that symptoms during AMI may be different in women than men. A positive correlation between advanced age and the incidence of silent myocardial ischemia has been reported (Lerner & Kannel, 1986). Research findings that document women with AMI as frequently older than 65 years of age supports the suggestion of a difference in symptom perception and, therefore, an "atypical" presentation. Thus, women may not have a "typical" presentation during AMI, resulting in failure to recognize the significance of symptoms and subsequent delay in seeking treatment. Until recently much of what was assumed to be true about CAD and AMI in women was based upon research which predominately involved men. The assumption whether such data can be extrapolated to women is unknown (Isles, Hole, Hawthrone, & Lever, 1992). Although little is known about certain aspects of CAD among women, perceptions regarding "typical" AMI presentation have been generalized to women. The result of this generalization is that both women and health care professionals may not recognize the significance of "atypical" symptoms (Moser & Dracup, 1993; Peterson & Alexander, 1998).

A related issue is the possibility that women and health care providers have failed to appreciate the prevalence and significance of CAD and MI in women. This failure may contribute to delay in seeking treatment for symptoms of AMI related to subsequent failure to realize the nature and origin of symptoms. Heart disease traditionally has been portrayed as a more significant problem for men than women (Hendel, 1990). This inaccurate portrayal has lead to an underestimation of the extent of the problem in women. Subsequently, many lay people and health care professionals are unaware that heart disease is the number one killer of women today (American Heart Association, 1997). Given this misperception, health care professionals may project less urgency to women regarding symptoms of AMI and directly contribute to delay in seeking treatment (Moser & Dracup, 1993).

Although few researchers have investigated the social context in which AMI occurs, this aspect in treatment seeking behavior may be one of the most significant in determining delay. In previous studies, it has been reported that consultation with an unrelated person (friend, co-worker, or stranger) resulted in significantly shorter delay times than for those individuals who consulted with a family member (Alonzo, 1986; Hackett & Cassem, 1969; Moss, Wynar, & Goldstein, 1969).

When women experience AMI they are older, therefore, they are more likely to be living alone or widowed and/or retired. At least, four times as many women as men are widowed at the time of their cardiac event. Living alone and experiencing symptoms in isolation may prove to be an independent predictor of delay (Dracup & Moser, 1993).

Women may be less likely to call 911 or involve others when experiencing symptoms and may instead choose to call their physician. Though this hypothesis proposed by Dracup and Moser (1993) has yet to be tested it is supported by Alonzo's (1986) findings. Alonzo (1986) found in a study of 1102 patients with AMI, that 93% of patients consulted with someone prior to seeking health care. An additional finding reported was that the spouse was the most sought lay consultant. In a more recent study Ashton (1999) found the only significant gender difference in how men and women seek care for symptoms of AMI to be, that men are more likely to contact their spouse when experiencing symptoms of AMI, while women are more likely to contact another family member (grown son or daughter) before their husbands.

Failure to perceive or recognize symptoms as cardiac in origin is predictive of increased delay. Women are less likely than men to believe they are having a MI when they had symptoms of AMI, thereby contributing to a longer delay in women. Patients who believed their symptoms were cardiac in origin sought medical treatment faster and used emergency medical services (EMS) more often than those who did not believe their symptoms were cardiac in origin. However, of those patients who believed their symptoms were cardiac in origin, less than 1/5 of the women reported they would call 911 as a first response and less than that would go the ER. Their most frequent response was to contact their physician (Meischke, Yasui, Kuniyuki, Bowen, Andersen, & Urban, 1999). Calling a physician has been shown to increase delay time significantly for both

men and women (Alonzo, 1986; Leitch et al., 1989; Schroeder, Lamb, & Hu, 1978; Simon, Feinleib, & Thompson, 1972).

Finally, the decision to try self-treatment, whether with over-the-counter or prescription medications or by reduction in activities, results in significantly increased delay times (Alonzo, 1986; Simon, Feinleib, & Thompson, 1972; Turi et al., 1986).

Although the research has identified factors predictive of increased delay, the studies have not investigated the psychological decision making processes behind them. Most of the information that does exist is a result of studies which use the Response to Symptoms Questionnaire (RTS). The RTS is a questionnaire designed to obtain information about factors contributing to delay in six areas: (1) symptom context (e.g., place, time of day); (2) antecedents of symptom (e.g., what patient was doing when symptoms began); (3) affective or emotional response to symptoms (e.g., severity of pain); (4) behavioral response to symptoms (e.g., patient's initial response to symptoms); (5) cognitive response to symptoms (e.g., symptom attribution); (6) the response of others to patient symptoms (e.g., behavioral and emotional responses of others) (Dracup & Moser, 1997).

The RTS has been used in two previous studies focusing on factors influencing the decision to seek treatment for symptoms of AMI. In 1994 Reilly and associates studied 77 (M=55, W=22) patients admitted with suspected or proven AMI. Mean and median delay times were 25.4 hours and 5 hours respectively. The researchers divided the patients into two groups. The "no delay" group - those arriving less than 3 hours (n=31) and the "delay" group - those arriving more than 3 hours (n=46) after symptom onset.

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The researchers chose 3 hours as the cut off based on information from the literature that suggests AMI patients spend an average of 84 minutes in the ER prior to receiving thrombolytic therapy. As a result of this patients in the "no delay" group were able to receive thrombolytic therapy within 4 hours. The 'window of opportunity' for thrombolytic agents to be effective when given is within 4 hours after the onset of symptoms. Data obtained using the RTS questionnaire revealed that advanced age, symptom onset with a family member present, and self-determination of symptoms as not being serious in nature all contributed to a delay longer than 3 hours (Reilly, Dracup, & Dattolo, 1994). In 1997, Dracup and associates used the RTS in a study of 277 patients with confirmed AMI enrolled in a thrombolytic clinical trial. It was reported that patients with longer delays were older, of lower socioeconomic status, and had diabetes. In addition, patients with longer delay experienced their symptoms at home, failed to perceive or recognize their symptoms as serious or originating from the heart, had symptoms that came and went, waited to see whether symptoms disappeared, worried about troubling others, feared what might happen if they sought treatment, and did not realize the importance of their symptoms. It is these cognitive and emotional responses found to affect patient's decisions to seek treatment, that need to be the focus of future research to uncover the decision-making processes leading to decreased delay time when seeking treatment for symptoms of AMI.

Although we have some recent research regarding the causes of delay - the research is lacking in identifying differences in causes of delay between men and women. Past

research has concentrated on determining sociodemographic, clinical and environmental factors associated with delay. The focus must now be on the cognitive and emotional processes that increase delay behavior in men and women and on the interrelationship of these processes with those clinical and sociodemographic factors already known to increase delay. The aims of the current study were: (1) to measure the delay time in men and women in seeking treatment for symptoms of AMI (2) to assess gender differences in symptoms and the response to symptoms and (3) to assess the relationships among gender, delay times and cognitive processes. Specifically, it was hypothesized that women will have longer delay times than men in seeking treatment for symptoms of AMI. Women and men will have different presenting symptoms and different initial responses to symptoms of AMI. And women and men will have different cognitive processes which affect delay time in seeking treatment for symptoms of AMI.

CHAPTER 2

METHODOLOGY

Participants

Patients were selected from the coronary care unit and telemetry floor of a large

community, non-profit, teaching hospital in South Dallas between June 28, 1999 and

December 31, 1999. Patients were between 41-82 years of age, with a mean age of 60.98

years, literate in English, and had a documented AMI within the past 72 hours. Criteria

for the diagnosis of AMI are:

1) diagnosis of AMI by cardiologist or internal/family medicine physician **AND** two or more of the following:
2) elevated Troponin I (determined by specific medical center laboratory values)
3) elevated CK/MB - creatine kinase, myocardial specific subgroup (determined by specific medical center laboratory values)
4) ST-segment elevation in two contiguous surface leads with or without Q waves on a 12-Lead EKG (electrocardiogram)
5) presence of Q waves on at least 2 leads on a 12-Lead EKG
6) symptomatology with a duration of greater than 15 minutes

All interviews using the Revised Response to Symptoms Questionnaire (Appendix A)

were conducted in English. Patients who were on mechanical ventilation and could not

speak or who experienced their symptoms in-hospital were excluded.

Risks and benefits (Appendix B) were explained to patients who met these criteria and an informed consent was obtained for patients willing to participate. The University of North Texas Health Science Center at Fort Worth and the participating hospital's Institutional Review Board approved the study prior to sample selection.

The final sample consisted of 50 participants - 21 women, 29 men, with the diagnosis of AMI. The mean age of was 59, $\underline{SD} = 9$, for women and 62, $\underline{SD} = 12$, for men. The ethnic mix consisted of: Caucasian (n = 28 or 56%), African American (n=15 or 30%), and Hispanic (n=7 or 14%). Seventy nine percent (n=23) of men were married. 33% (n= 7) of women were married. Fewer women (n=6 or 29%) were employed outside the home compared with men (n= 17 or 59%). Fifty two percent (n = 15) of men and 43% (n = 9) of women had greater than a high school education. Two women and five men meeting the study criteria declined to participate. One woman meeting the study criteria expired before being interviewed.

Materials

The Revised Response to Symptoms (RRTS) questionnaire (Appendix A) originally developed by the Thrombolysis in Acute Myocardial Infarction Trail investigators, took 30 minutes to complete. The original questionnaire elicits information regarding all symptom context factors (e.g., place, time of day) and some clinical status/health history factors such as severity of chest pain, meaning of symptoms, anxiety and stress levels, comfort with seeking care, and identification of which family member was present at symptom onset. The original instrument had acceptable content validity and internal

consistency (Reilly, Dracup, & Dattolo, 1994). Revisions to the original questionnaire included the addition of questions regarding knowledge about risk factors for heart disease, and who assumes the role of head-of-the-household. Question number 25 was converted to a Lickert Scale to allow for factor analysis of the data. Content validity of the RRTS questionnaire was re-established through a panel of experts composed of a Health Psychologist, Cardiologist and an Epidemiologist. No other instrument was available for obtaining this specific information.

The following six cognitive, emotional factors are addressed by the RRTS questionnaire:

Symptom Awareness refers to the acknowledgment of any acute physical sensations or symptoms that were felt by the patient (Dempsey, Dracup, & Moser, 1995), and included the following questions: 15. Your first symptom(s) was (were)...; 16. Did you experience any of the following symptoms during your heart attack?; 25. Your symptoms came and went.

Perceived Insignificance is the process by which the patient decided that the symptom or symptoms that he/she experienced did not signify a dangerous/life-threatening situation (Dempsey, Dracup, & Moser, 1995), and included the following questions: 13. When you first experienced your symptom, how serious did you believe they were?; 14. When you first experienced your symptoms, you thought the problem was...; 25. Waited to see if your symptoms would go away; Not recognizing symptoms as heart symptoms; Not wanting to trouble anyone; Feared what might happen; Didn't

know what the symptoms of a heart attack were; Didn't realize the importance of your symptoms; Thought the pain or symptoms were something else; 26. Do you think men over the age of 65 are more likely to have a heart attack than women over age 65?; 27. Is heart disease as serious in women as in men?; 28. Are heart attacks as serious in women as in men?; 29. What had your doctor or any doctor told you about the symptoms of a heart attack?

Self-Treatment refers to strategies implemented by patients to resolve symptoms and to maintain a sense of psychologic control (Dempsey, Dracup, & Moser, 1995), and included the following questions: 17. What was the first thing you did when you first noticed your symptoms?; 25. You believed you could treat your symptoms yourself.

Perceived Threat refers to symptoms that are perceived as significant because they continued despite self-treatment (Dempsey, Dracup, & Moser, 1995), and included the following questions: 25. Embarrassment; Feared what might happen; Your symptoms came and went.

Lay Consultation refers to the advice of a family member, friend, or coworker that is sought. Properties of lay consultation include: "seeking information", "seeking validation", and "seeking support" (Dempsey, Dracup, & Moser, 1995), and included the following questions: 20. If you told a layperson about your symptoms, how long did you have your symptoms before you told them?; 22. Who made the decision to come to the hospital?

Symptom Context describes the context (e.g., place, time of day, activities, alone or with others) in which the symptoms occurred, and included the following questions: 10. Where were you when you first noticed your symptoms?; 11. What were you doing when you first noticed your symptoms?; 12. What time of day did you first notice your symptoms?; 18. When you first noticed your symptoms you were...(alone, with your spouse, with family...); 19. If you were with other people, how did they respond to you?

Procedure

Data collection began in the Summer, 1999. Data was collected between the hours of 0700 to 1700 six days a week. Patients were screened for inclusion criteria during the principal investigator's rounds on the coronary care unit and telemetry floors. A list of patients meeting the inclusion criteria was complied to avoid interviewing a patient more than once, should they have been readmitted at a later date. This list was maintained in locked file cabinet accessible only by the principal investigator and was not linked to the questionnaires for the purpose of identifying patients. After completion of data analysis, the list of names was destroyed.

Upon meeting the inclusion criteria each prospective participant was given an explanation of the purpose of the study (see Appendix B). The participants then were interviewed using the RRTS. To reduce the participant's stress/anxiety level, a copy of the questionnaire was given to them to look at as they were being interviewed. The principal investigator read the questions to the participant and wrote down their

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responses. In an attempt to reduce any possible ambiguity in questions, the principal investigator referred the participant back to the original question and the question was read to the participant again for clarification. No information identifying the individual participants was on the questionnaire. Upon completion of the interview the principal investigator thanked the participants for their participation and the completed questionnaires were locked in a file cabinet accessible only to the principal investigator.

CHAPTER 3

RESULTS

The demographic and clinical characteristics of the participants in this study were described using means and standard deviations. Medians were used for continuous, non-normally distributed data, and frequencies and proportions were reported for categorical/dichotomous data. For normally distributed, continuous data, independent samples t-tests using equal or unequal variances as appropriate, or analyses of variance (ANOVA) were used. Univariate analyses were performed to assess the impact of the sociodemographic, behavioral, cognitive, and emotional factors on the time from symptom onset to arrival at the hospital. Because delay time was positively skewed violating the assumption of normality, and remained skewed after log transformation, nonparametric tests (Mann Whitney and Kruskal Wallis tests) were conducted. For categorical/dichotomous data (e.g. comparisons made between men and women), analyses were performed using chi-square tests. When the assumptions of the chi-square test were violated (expected frequencies less than 5 for all cells), the Fisher's Exact Test was used. Assumptions for all tests were examined for violations. Significance was set at $p < 0.05$. All tests, unless otherwise noted, were performed using non-directional tests (two tailed hypothesis testing).

<u>Time to delay</u>

Delay time for each of the 50 participants was obtained by asking the question, "How long did you have your symptoms before you arrived at the hospital?" This was the total time from when participants first noticed their symptoms to the time they arrived at the hospital. Participants answers to this question were verified through a review of their hospital chart. A Mann Whitney with gender as the independent variable was conducted on the delay times. Although the mean delay times appeared different between men ($\underline{M}$ = 7.5, $\underline{SD}$ = 8.4, $\underline{Mdn}$ = 4 hours) and women ($\underline{M}$ = 13.4, $\underline{SD}$ = 20, $\underline{Mdn}$ = 6.8 hours) the difference was not significant. The variances of 8.4 for men and 20 for women were statistically different (Levene's Test for Equality of Variances, F = 6.710, df = 1/48, p = .013), therefore the Mann Whitney was conducted with unequal variances. Of the 50 participants 52% (n = 11) of the women and 41% (n = 12) of the men waited more than 6 hours before deciding to seek treatment for their symptoms of AMI.

To determine if age affected delay times, participants were divided into two groups, less than 60 years of age ("younger") or 60 years of age and older ("older"). A Mann Whitney with age as the independent variable was conducted on delay times. Although the mean delay times appeared different between "younger" participants ($\underline{M}$ = 6.4, $\underline{SD}$ = 7.3 hours) and "older" participants ($\underline{M}$ = 13.2, $\underline{SD}$ = 18.6 hours) the difference was not significant.

Martial status

Sixty percent (n = 30) of the participants were married, 40% (n = 20) of the participants were not married. A Mann Whitney with marital status as the independent variable was conducted on delay times. Although the mean delay times appeared different between married ($\underline{M}$ = 7.8, $\underline{SD}$ = 8.6 hours) and unmarried participants ($\underline{M}$ = 13.2, $\underline{SD}$ = 20.5 hours) the difference was not significant. Marital status did not impact delay time.

Symptoms

"Typical" presentation of AMI may be described as mild to severe, crushing or squeezing pain in the chest with or without radiation to the jaw and one or both arms. "Atypical" presentation may be described as pain in shoulder blades, neck or jaw pain, pain going down one or both arms, and/or back pain. Because previous research has reported that women may not have a "typical" presentation during AMI (Isles, Hole, Hawthrone, & Lever, 1992), symptoms were combined as "typical" and "atypical" for analysis. Participants were asked to identify all symptoms that applied to their experience from a list of 17 possible symptoms. Participants responses then were coded as "typical" and "atypical" so that each participant had two dichotomous variables. A chi square test was conducted with gender and "typical" pain as the variables. Because the assumptions of the chi square test were violated the Fisher's Exact test was used. Fisher's Exact test was not significant for differences between men and women with chest pain or "typical" presentation during AMI. Both men and women experienced classic chest pain associated with their AMI (Table I). A chi-square test was conducted

with gender and "atypical" pain as the variables. The chi-square test was significant (X^2 = 7.229, df = 1, p = 0.007) for differences between men and women with "atypical" presentation during AMI. Women in this study experienced more "atypical" symptoms than men (Table II).

Table I
"Typical" presentation during AMI

Frequency Percent Row Percent Column Percent	Male	Female	Total
No	2 4.00 40.00 6.90	3 6.00 60.00 14.29	5 10.00
Yes	27 54.00 60.00 93.10	18 36.00 40.00 85.71	45 90.00
Total	29 58.00	21 42.00	50 100.00

Table II
"Atypical" presentation during AMI

Frequency Percent Row Percent Column Percent	Male	Female	Total
No	13 25.00 86.67 44.83	2 5.00 13.33 9.52	15 30.00
Yes	16 32.00 45.71 55.17	19 38.00 54.29 90.48	25 70.00
Total	29 58.00	21 42.00	50 100.00

Severity of Chest Pain

Participants were asked on a scale of 1 to 10 (with 10 being the worst pain ever experienced and 1 being no pain), how much pain did they have during their AMI? Severe pain was defined as pain rated 8, 9 or 10. 66% (n = 19) of men and 76% (n = 16) of women characterized their chest pain as severe. A Mann Whitney with gender as the independent variable was conducted on the delay times. The Mann Whitney test was not significant for differences in delay times of men and women with severe chest pain ($\underline{M}$ = 6.4, $\underline{SD}$ = 6.2 hours for men, $\underline{M}$ = 15, $\underline{SD}$ = 22.1 hours for women). Severe chest pain did not influence men or women to seek treatment sooner.

Initial Response to Symptoms

Initial response to symptoms was determined through the question, "What was the **first** thing that you did when you first noticed your symptoms?". This question consisted of 13 responses from which the participants were to choose their initial response to their symptoms. The predominant response was "took medication" (n = 17 (9 women, 8 men) or 34%). Medication included antacids reportedly taken by 11 participants and acetaminophen taken by 6 participants. "Tried to pretend that nothing was wrong" was the second most predominant response (n = 5, 10%). No participants called 911. Further comparison of initial response to symptoms was carried out using chi-square test. For this analysis responses were grouped into "active" and "passive" groups. Eight responses, (e.g., took medication, called your doctor, told a friend of symptoms, called 911), made up the "active" group. Six responses, (e.g., wished symptoms would go

away, prayed symptoms would go away, tried to relax), made up the "passive" group. A chi square was conducted with gender and "active" versus "passive" response to symptoms as the variables. The chi-square test was not significant for differences between men and women and their initial responses to AMI symptoms. Fifty five percent (n = 16) of men and 52% (n = 11) of women reported an "active" initial response to their symptoms. While 45% (n = 13) of men and 48% (n = 10) of women had a "passive" initial response to their symptoms (Table III). As a result of this men and women do not tend to use "active" and "passive" mechanisms differently.

Table III
"Active"/"Passive" initial response to symptoms

Frequency Percent Row Percent Column Percent	"Active"	"Passive"	Total
Male	16 32.00 55.17 59.26	13 26.00 44.83 56.52	29 58.00
Female	11 22.00 52.36 40.74	10 20.00 47.62 43.48	21 42.00
Total	27 54.00	23 46.00	50 100.00

Cognitive and Emotional Response to Symptoms

Cognitive response to symptoms was assessed by two questions: "When you first experienced your symptoms, how serious did you believe they were?" and "When you first experienced symptoms, you thought the problem was...". Participants appraisal of

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symptom seriousness was ranked from 1 (not at all serious) to 5 (extremely serious). Independent samples t test with gender as the independent variable was conducted on the appraisal of symptom seriousness. The independent samples t test with unequal variances was not significant. Women appraised their symptoms as $\underline{M}$ = 2.5, $\underline{SD}$ = 1.4. While men appraised their symptoms as $\underline{M}$ = 2.1, $\underline{SD}$ = 1.0. Men and women did not tend to differ in their appraisal of symptom seriousness. Participants attributed their symptoms to either their heart, indigestion, or other body systems. Other body systems was defined as muscle pain, fatigue, heat exhaustion, gall stones, stroke, pancreatitis, low blood sugar, and panic attack. A chi square was conducted with gender and indigestion versus heart versus other body systems as the variables. Because the assumptions of the chi square were violated the Fisher's Exact test was used. The Fisher's Exact test was not significant for differences between men and women and their attribution of symptoms to heart, indigestion, or other body systems. Only 21% (n = 6) of men and 10% (n = 2) of women thought their symptoms were coming from the heart. The most common etiology thought to be accounting for symptoms in both men and women was indigestion (52%, n = 15, and 43%, n = 9, respectively). Symptom attribution to other body systems was reported by the remaining 28% (n = 8) of men and 48% (n = 10) of women. Men and women did not tend to differ in the cognitive process of symptom attribution (Table IV).

Table IV
Symptom attribution

Frequency Percent Row Pct Column Pct	Indigestion	Heart	Other	Total
Male	15	6	8	29
	30.00	12.00	16.00	56.00
	51.72	20.69	27.59	
	62.50	75.00	44.44	
Female	9	2	10	21
	18.00	4.00	20.00	42.00
	42.66	9.52	47.62	
	37.50	25.00	55.56	
Total	24	8	18	50
	48.00	16.00	36.00	100.00

Most people do not seek immediate help for their symptoms when experiencing a heart attack. Perceived insignificance of ones symptoms has been reported to be predictive of increased delay (Dempsey, Dracup, & Moser, 1995; Dracup & Moser, 1997). To evaluate the impact of perceived insignificance upon the decision to seek treatment for symptoms of AMI, participants were asked to answer 0 (not at all), 1 (somewhat), or 2 (a great deal) to the following seven statements: waited to see if your symptoms would go away; not recognizing symptoms as heart symptoms; not wanting to trouble anyone; feared what might happen; didn't realize the importance of symptoms; thought the pain or symptoms were something else; you believed you could treat your symptoms yourself. Each participants scores from the seven statements were totaled, resulting in a total score for men and a total score for women. Independent samples t test with gender as the independent variable was conducted on the total scores from the seven

statements. The independent samples t test with unequal variances was significant ($t = -2.813$, $df = 47.624$, $p = .007$). The mean score for women was 1.5 ($\underline{SD} = .29$) and for men 1.2 ($\underline{SD} = .45$). Globally a significant difference between men and women's cognitive and emotional processes relating to perceived insignificance was found. Women reported these seven aspects of perceived insignificance as having a greater impact upon their decision to delay in seeking treatment for their AMI symptoms. For additional analysis responses 1 and 2 were combined to equal "impact", while 0 was renamed "no impact". Next a chi-square test was conducted with gender and each of these seven aspects of perceived insignificance to see what made up the global difference found. The chi-square test was significant ($\underline{X}^2 = 4.258$, $df = 1$, $p = .039$) for differences between men and women only in the aspect of self-treatment. 86% ($n = 18$) of women reported that their belief they could treat themselves influenced their decision to seek treatment. While only 59% ($n = 17$) of the men held this belief which in turn influenced their decision to seek treatment (Table V).

Beliefs About Gender and Heart Disease

To assess additional cognitive factors surrounding participant's decision to seek treatment for AMI, three questions regarding heart disease in men and women were asked of participants. (These three questions were number 26, 27, and 28 respectively on the RRTS) 1) Do you think men > 65 are more likely to have heart disease than women > 65? A chi square was conducted with gender and 'YES/NO' as the response to question 1 as the variables. The chi-square was not significant. Forty three percent of

women and 45% of men said YES (Table VI). A similar percentage of men and women

thought heart disease was still predominantly a mans disease.

Table V
Self-treatment

Frequency Percent Row Percent Column Percent	No Impact	Impact	Total
Male	12 24.00 41.38 80.00	17 34.00 58.62 48.57	29 58.00
Female	3 6.00 14.29 20.00	18 36.00 85.71 51.43	21 42.00
Total	15 30.00	35 70.00	50 100.00

Table VI
Do you think men > 65 are more likely to have heart disease than women > 65?

Frequency Percent Row Percent Column Percent	Yes	No	Total
Male	13 26.00 44.83 59.09	16 32.00 55.17 57.14	29 58.00
Female	9 18.00 42.86 40.91	12 24.00 57.14 42.86	21 42.00
Total	22 44.00	28 56.00	50 100.00

2) Is heart disease as serious in women as in men?. A chi square was conducted with gender and 'YES/NO' as the response to question 2 as the variables. The chi-square was significant ($\underline{X}^2$ = 4.258, df = 1, p = .039). Eighty six percent of women and 59% of men said YES (Table VII). More women than men believed heart disease was as serious in women as in men. 3) Are heart attacks as serious in women as in men? A chi square was conducted with gender and 'YES/NO' as the response to question 3 as the variables. The chi-square was marginally significant ($\underline{X}^2$ = 3.607, df = 1, p = .058). Eighty one percent of women and 55% of men said YES (Table VIII). More women than men tended to believe that heart attacks in women are as serious as in men.

Table VII
Is heart disease as serious in women as in men?

Frequency Percent Row Percent Column Percent	Yes	No	Total
Male	17 34.00 58.62 48.57	12 24.00 41.38 80.00	29 58.00
Female	18 36.00 85.71 51.43	3 6.00 14.29 20.00	21 42.00
Total	35 70.00	15 30.00	50 100.00

Table VIII
Are heart attacks as serious in women as in men?

Frequency Percent Row Percent Column Percent	Yes	No	Total
Male	16 32.00 55.17 48.48	13 26.00 44.83 76.47	29 58.00
Female	17 34.00 80.95 51.52	4 8.00 19.05 23.53	21 42.00
Total	33 66.00	17 34.00	50 100.00

Perceived Risk of Heart Disease

To determine participants health-care seeking behavior prior to this hospitalization, participants were asked "Had you seen a physician for chest pain before?". A chi square was conducted with gender and 'YES/NO' as the response to the fore mentioned question as the variables. The chi-square was not significant. Fifty seven percent (n = 12) of women and 31% (n = 9) of men said YES (Table IX). For those answering YES

Table IX
Had you seen a physician for chest pain before?

Frequency Percent	Male	Female	Total
No	20 69.0	9 42.9	29 58.0
Yes	9 31.0	12 57.1	21 42.0
Total	29 100.00	21 100.00	50 100.00

to this question, 48% (n = 10/21) of all participants were told their pain was cardiac in origin. A Mann Whitney with cardiac versus non-cardiac as the independent variables was conducted on delay times. The Mann Whitney test was non-significant for differences in time to delay between those who were told their chest pain was cardiac in origin versus those who were told their chest pain was non-cardiac. (M = 16.3, SD = 26.7 hours, (n = 10), M = 7.9, SD = 7.9 hours (n = 11) respectively). Despite being told that one's chest pain was cardiac in origin, there was no advantage in terms of reducing delay times.

The final question asked of participants was, "Can you identify your risk factors for heart disease?". If participants were able to identify at least one of their risk factors for heart disease, yes was the answer to this question. For those unable to identify even one of their risk factors, no was the answer to this question. A chi square was conducted with gender and 'YES/NO' as the response to "can you identify your risk factors for heart disease?" as the variables. The chi-square was non-significant. 58% of all respondents (67% (n = 14) of women and 52% (n =15) of men) could **not** identify one risk factor for heart disease in themselves (Table X). Men and women did not differ in their ability to identify their risk factors for heart disease.

Table X
Can you identify your risk factors for heart disease?

Frequency Percent Row Percent Column Percent	Yes	No	Total
Male	14 28.00 48.28 66.67	15 30.00 51.72 51.72	29 58.00
Female	7 14.00 33.33 33.33	14 28.00 66.67 48.28	21 42.00
Total	29 58.00	21 42.00	50 100.00

However, the delay time for those who could not identify a risk factor was significantly longer (Mann Whitney, $p = .018$) than for those who could name even one risk factor ($\underline{M} = 13.4$ hours, $\underline{SD} = 17.7$, $\underline{Mdn} = 8$ hours versus $\underline{M} = 5.2$ hours, $\underline{SD} = 6.5$, $\underline{Mdn} = 2.5$ hours, respectively). A Mann Whitney with ability to identify personal risk factors as the independent variable was conducted on the delay times. Knowledge of at least one personal risk factor for heart disease influenced participants to seek treatment sooner than those unable to identify even one personal risk factor.

CHAPTER 4

DISCUSSION AND STUDY IMPLICATIONS

The aims of this current study were: (1) to measure the delay time in men and women in seeking treatment for symptoms of acute myocardial infarction (2) to assess gender differences in symptoms and the response to symptoms and (3) to assess the relationships among gender, delay times and cognitive processes.

In spite of public education campaigns and life-saving interventions introduced over the past three decades, delay times have not dramatically improved. Because the viability of myocardium after coronary occlusion is limited and dependent on both duration and severity of ischemia, early presentation to a hospital is vital in reducing mortality. The past three decades of research reveals an average median delay time of 3.3 hours (Dracup & Moser, 1991). In this study the median delay time for women was 6.8 hours and 4 hours for men. Although the median delay times in this study appeared different, the difference was not significant.

Unlike previous studies (Meischke, Yasui, Kuniyuki, Bowen, Anderson, & Urban, 1999; Moser, & Dracup, 1993) women in the current study were just as likely as men to have chest pain as part of their symptom complex. Preliminary reports suggest that in women pain during an AMI may be (1) centered in the chest with or without radiation to one or both arms; (2) located in the ear, jaw, or neck region; or (3) located in the back or

shoulder region (Penque, Halm, Smith, Deutsch, Van Roekel, McLaughlin, Dzubay, Doll, & Beahrs, 1998). With all these variations, heart disease in woman may not have a "typical" presentation during AMI. Women in the current study reported accompanying their chest pain were symptoms of, pain in shoulder blades, neck or jaw pain, pain going down one or both arms, and/or back pain. A significant difference was found between men and women and the presentation of "atypical" symptoms during AMI, with more women than men experiencing these symptoms. However, no significant difference was found between men and women and the presentation of "typical" symptoms during AMI. The symptom complex of acute myocardial infarction in men and women was not markedly different. A finding consistent with results reported by Penque, et. al., in 1998.

Men and women in the current study were not only found to not markedly differ in their symptom presentation, but also did not differ in their initial response to symptoms. "Active" and "passive" mechanisms utilized as the initial response to symptoms of AMI were not used differently by men and women. The predominant initial response to symptoms by both men and women was "took medication" (n = 17 or 34%). Another 10% (n = 5) responded to their symptoms with an unproductive delaying strategy (i.e., tried to pretend that nothing was wrong). The surprising finding was that no participants called 911. These findings are in stark contrast to the current recommendations of the National Heart Attack Alert Program of the National Institutes of Health to have all patients experiencing AMI symptoms call 911 (Dracup, Alonzo, Atkins, Bennett, Braslow, & Clark, 1997). Health care professionals who want to reduce delay time in

seeking treatment for AMI symptoms need to prepare patients to anticipate these unproductive responses. Previous research has shown that by preparing patients to anticipate an adverse situation, anxiety is decreased and patients are more likely to cope effectively (Dempsey, Dracup, & Moser, 1995).

The cognitive processes of symptom attribution and appraisal of symptom seriousness were not significantly different between men and women in the current study. The phenomenon of individuals not appraising their symptoms as serious in nature is an area for future research. Understanding this process could provide important information upon which to base interventions to decrease delay time. Most patients experiencing a heart attack attribute their symptoms to a more benign cause as indigestion. This was the most common etiology thought to be accounting for symptoms in both men and women in this study. Millions of dollars have been spent on media and public education campaigns to inform people of the symptoms of a heart attack, only to find that men and women are still more likely to attribute their symptoms to indigestion. As a result of this one has to ask what role denial plays in treatment seeking delay. Little research has looked at the role of denial in making the decision to seek treatment for symptoms of AMI. An important limitation of the study of denial has been the lack of an appropriate psychometric instrument (Wielgosz, A., Nolan, Earp, Biro, & Wielgosz, M., 1988). Of those participants in the current study who had seen a physician before for chest pain and were told their chest pain was cardiac in origin, their delay times were not significantly different from those who were told their chest pain was non-cardiac in origin.

Surprisingly the delay times were in the opposite direction of what one would think, for those who were told their chest pain was cardiac in origin. Despite being told by a physician that one's chest pain was cardiac in origin, delay time was not reduced, in fact, delay time was slightly increased. Calling or consulting with a physician has been shown to increase delay time significantly for both men and women (Alonzo, 1986; Leitch, Birbara, Freedman, Wilcox, & Harris, 1989; Schroeder, Lamb, & Hu, 1978; Simon, Feinleib, & Thompson, 1972).

The first variable found in this study to differ significantly between men and women was the cognitive and emotional aspects of perceived insignificance. Perceived insignificance was the process by which participants decided that the symptoms that they experienced did not signify a dangerous situation (Dempsey, Dracup, & Moser, 1995). Women in this study scored higher than men overall on the seven aspects making up perceived insignificance. In doing so, the process of perceived insignificance had a greater impact upon women's decision, than men's, to delay in seeking treatment for symptoms of AMI. Although this finding of perceived insignificance contributing to an increased delay in seeking treatment for symptoms of AMI is consistent with previous research (Reilly, Dracup, & Dattolo, 1994; Dracup & Moser, 1997), no previous research has specifically explored differences in perceived insignificance between men and women as in this study. Individual comparisons between men and women of the seven aspects making up perceived insignificance found that only the belief that one could treat themselves was significant. A significantly greater percentage of women than men (86%

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and 59% respectively) implemented extensive self-treatment strategies that impacted

their decision to seek treatment for their symptoms of AMI. It has been reported in

previous research (Dempsey, Dracup, & Moser, 1995) that when women implement self-

treatment strategies, they are assisted in their maintaining feelings of control. When

people feel they can control aversive events, they cope better with those events.

Unfortunately during an AMI, women's attempts to maintain control works against them

by increasing delay time and putting them outside the "window of opportunity" for

effective thrombolytic therapy. In other studies (Turi, et. al., 1986; Meischke, Eisenberg,

Schaeffer, Damon, Larsen, & Henwood, 1995) the decision to try self-treatment resulted

in significantly increased delay times. However, no previous research has specifically

compared self-treatment or the implementing of symptom alleviating strategies between

men and women.

The second variable found in this study to differ significantly between men and

women was beliefs about gender and heart disease. Although a similar percentage of

men and women thought heart disease was still predominantly a mans disease,

significantly more women than men believed heart disease and heart attacks were as

serious in women as in men. Of importance to note here, is that the women in this study

had just experienced and survived a myocardial infarction. Therefore their beliefs and

answers to these questions regarding beliefs about gender and heart disease, may have

been influenced by their current experience. No previous research has compared beliefs

about gender and heart disease among men and women.

The final significant finding of this study - that participants who could not identify a personal risk factor for heart disease delayed longer than those who could name even one personal risk factor - has not been explored in previous research. The thought here being that knowing one is at risk for heart disease may influence one to seek treatment sooner.

The only other researchers who have reported using the Response to Symptoms questionnaire (Reilly, Dracup, & Dattolo, 1994; Dracup & Moser, 1997) found that cognitive and emotional responses do affect patients' decision to seek treatment. However, neither of these previous studies specifically explored whether or not differences existed between men and women and the cognitive and emotional processes utilized by them when making the decision to seek treatment for symptoms of AMI.

The potential to have an impact on post myocardial infarction morbidity and mortality by understanding the cognitive and emotional processes men and women use to make the decision to seek treatment for symptoms of AMI is certainly tremendous. However this study had several limitations. First the sample size was small and included 'outliers'. These 'outliers' were not by definition true outliers, but instead were a population identified as being at high risk for increased delay. The large standards of deviation seen in this study were due to these 'outliers'. Second participation in this study was voluntary. Seven eligible patients declined to participate. Loss of data from these participants may have biased the sample if they were in general more likely to delay or respond to symptoms in a particular fashion. Third because a questionnaire was used to obtain data, the assumption was made that participants were telling the truth when

answering questions of the RRTS during the interview procedure. The interviews were conducted within 72 hours of admission. This time interval realistically could have allowed the participants to develop a rationale for the cause of symptoms and subsequent delay in seeking treatment. Reports of the prehospital experience may have been affected by efforts to understand the experience. Further, events which occurred following admission, such as interaction with health care providers, could have intervened to alter the recollection of the experience. Certainly, the most effective method to study health care seeking behavior would be a prospective study in which participants would transcribe symptom experience and subsequent behavior during the prehospital experience. However, even this procedure of transcription could intervene to alter the prehospital experience. Fourth the women in this study had an average age of 59 which is young compared to women included in previous research who were 65 years old and older. Thus the women in this study may not represent the average population of women having an AMI, and therefore may have contributed to the non-significant differences in delay times found between men and women in this study. Fifth the findings pertain only to men and women who survived an AMI. Thus these findings cannot be generalized to nonsurvivors.

Although this study found significant differences in the cognitive and emotional processes men and women use to make the decision to seek treatment for symptoms of AMI, more research needs to be conducted in this area. The women who participated in this study reported an initial perceived insignificance of symptoms which led to the

implementation of attempts at symptom alleviation, which in turn influenced their decision to delay in seeking treatment for their symptoms of AMI. Therefore, these findings indicate the need to address the significance of symptoms of AMI, the basis for **not** implementing symptom alleviating strategies and the importance of seeking treatment promptly. Specifically, health care providers must inform women of the potential for reduction in infarction size through the use of thrombolytic therapy and additional medical and surgical interventions. Health care providers must also inform women about the prevalence and seriousness of CAD in women, and the importance of recognizing "atypical" symptoms of AMI. At the same time health care providers themselves must begin to expect the unexpected in women, for heart disease is the number one killer of both men and women today.

Further research is needed of delay in making the decision to seek treatment among women with symptoms of AMI which include a larger sample size with a more diverse ethnic mix, and multiple sites. Further research is also needed to investigate the clinical presentation of AMI and perception of symptoms in women. Research of gender differences in behavioral responses of AMI also requires further investigation.

Previous research has recommended public education as a means of reducing delay in seeking treatment for symptoms of AMI. The results of this study confirm that the median delay time is not becoming shorter, despite efforts at public education over the past three decades. One reason for this may be the lack of women used in these campaigns. One suggestion for public education campaigns in the future is having

women describe the symptoms of myocardial infarction as they experienced them, as well as, discussing risk factors for heart disease. Women must be told heart disease is as serious in women as in men and this may be an effective vehicle for communicating this knowledge to women.

Based on the findings in this study, the decision to seek treatment for women with symptoms of AMI is based upon thoughts, feelings, and knowledge influenced by personal and situational factors. Women and health care providers must perceive CAD as serious a problem in women as in men. Until this perception occurs, it is conceivable that women will continue to perceive symptoms of AMI as initially insignificant, and implement symptoms alleviation strategies prior to seeking treatment.

APPENDIX A

Revised Response to Symptoms Questionnaire

DELAY TIME (IN HOURS AND
MINUTES OR MINUTES) - ARRIVAL TO ER

_____

DELAY TIME (IN HOURS AND
MINUTES OR MINUTES) - ER TO TREATMENT
            (Thrombolytic therapy, PTCA, other - ASA, Heparin)

_____

REVISED RESPONSE TO SYMPTOMS QUESTIONNAIRE

People may experience many different symptoms when they have a problem with their heart. By "symptoms" we mean the feeling that was unusual or out of the ordinary that prompted you to seek medical care (e.g. dizziness, fatigue, chest pain, chest discomfort, or indigestion). The following questions are being asked to determine how you responded to your symptoms before you came to the hospital.

1.   **What is your age?_____**

2.   **Sex: 0. Male   1. Female**

3.   **Marital Status:**

     0. Never married
     1. Married: Year_____
     2. Divorced
     3. Widowed
     4. Separated

4.   **Ethnicity:**

     1. American Indian
     2. Asian
     3. Black
     4. Hispanic-Latino
     5. White
     6. Other (please specify)_____

5.   **How many years of education do you have?_____**

6.   **Do you consider yourself head-of-the-household?_____**
     How many people depend on you?_____

7.   Employed outside the home: 0. No   1. Yes

If employed outside the home, how many hours/week?_____

8.   Retired: 0. No   1. Yes

9.   What was the total household income from all sources before taxes for 1998?

1. Less than $5,000
2. $5,000 - $9,999
3. $10,000 - $19,000
4. $20,000 - $39,000
5. $40,000 - $59,000
6. Greater than $60,000
7. Omit

10. ʹ Where were you when you first noticed your symptoms?

1.   at home
2.   at work
3.   other (please indicate where)_____

11.   What were you doing when you first noticed your symptoms?

1.   sleeping
2.   resting
3.   walking
4.   eating
5.   having sex
6.   engaged in recreational activity (such as bowling, golf, gardening, etc.)
7.   engaged in household chores (such as sweeping, making bed, etc.)
8.   washing or dressing
9.   thinking
10.   watching TV or listening to the radio
11.   going to the bathroom
12.   reading
13.   talking or listening
14.   other (please indicate what)_____

12.   What time of day did you first notice your symptoms (please indicate as close
as possible the exact time, including am or pm)?_____

13. **When you first experienced your symptoms, how serious did you believe they were?**

1	2	3	4	5
not at all serious				extremely serious

14. **When you first experienced symptoms, you thought the problem was...**

1. your heart
2. indigestion
3. muscle pain
4. fatigue
5. other (please indicate)_____

15. **Your first symptom(s) was (were)...(please describe in detail)**_____

_____

_____

_____

16. **Did you experience any of the following symptoms during your heart attack?** (circle all that apply)...

1. breathlessness or feeling short of breath
2. fatigue
3. weakness
4. vague chest discomfort
5. neck or jaw pain
6. mild chest pain
7. moderate chest pain
8. severe chest pain
9. pain going down one or both arms
10. pain in shoulder blades
11. back pain
12. nausea
13. feeling that something is wrong
14. sweating
15. feeling clammy
16. heartburn or indigestion
17. dizziness or feeling faint
18. other (please indicate)_____

17. **What was the first thing that you did when you first noticed your symptoms?**

    1. wished that they would go away
    2. prayed that they would go away
    3. tried to relax
    4. tried not to think about them
    5. took medication
    6. called your doctor
    7. told a friend
    8. told a member of your family
    9. told a co-worker
    10. told a stranger
    11. thought that you were going to die
    12. tried to pretend that nothing was wrong
    13. called 911 or the paramedics or ambulance
    14. other(please indicate)_____

18. **When you first noticed symptoms you were...**

    1. alone
    2. with your spouse
    3. with another family member (please indicate who)_____
    4. with friends
    5. with people at work
    6. other (please indicate)_____

19. **If you were with other people, how did they respond to you?**

    1. they said/did nothing
    2. they told you not to worry about it
    3. they tried to comfort you
    4. they suggested that you rest and/or take medication
    5. they suggested that you get medical help
    6. they called for help
    7. they got upset
    8. other (please indicate)_____

20. **If you told a layperson (someone other than your doctor such as family, friend, co-worker, or stranger who was not a medical person) about your symptoms, how long did you have your symptoms before you told them.**
    _____(write in the number of hours and minutes)

21. How long did you have your symptoms before you arrived at the hospital? This is the total time from when you first noticed your symptoms to the time that you arrived at the hospital._____(write in the number of hours and minutes)

22. Who made the decision to come to the hospital?_____

23. How did you get to the hospital (personal car of family member, friend, co-worker, stranger; drove yourself; or ambulance)?_____

24. On a scale of 1 to 10 (with 10 being the worst pain you have ever had and 1 being no pain), how much pain did you experience?_____

25. Most people do not seek immediate help for their symptoms when experiencing a heart attack. How much did the following play into your decision to seek help for your symptoms?...

Key: 0 = not at all   1 = somewhat   2 = a great deal

Waited to see if your symptoms would go away....................0   1   2

Embarrassment...0   1   2

Not recognizing symptoms as heart symptoms.....................0   1   2

Not wanting to trouble anyone...0   1   2

Feared what might happen..0   1   2

Didn't know what the symptoms of a heart attack were.....0   1   2

Didn't realize the importance of your symptoms...................0   1   2

Your symptoms came and went...0   1   2

Thought the pain or symptoms were something else.............0   1   2

You believed you could treat your symptoms yourself...........0   1   2

Were there any other reasons why you delayed seeking help/treatment?

_____

_____

_____

5

26. Do you think men over the age of 65 are more likely to have heart disease than women over the age of 65?   0. No   1. Yes

27. Is heart disease as serious in women as in men?   0. No   1. Yes

28. Are heart attacks as serious in women as in men?   0. No   1. Yes

29. What had your doctor or any doctor told you about the symptoms of a heart attack?_____

_____

_____

30. Had you seen a physician for chest pain before this hospitalization?
0. No   1. Yes

31. If yes, what did the physician tell you about your chest pain?_____

_____

_____

_____

32. If you had chest pain before this hospital admission, but did not see a doctor, please tell us why you did not._____

_____

_____

_____

33. What are the risk factors for heart disease?_____

_____

_____

_____

34. Has your doctor or any one else told you that you were at risk for a heart attack or for developing heart disease?_____

_____

_____

_____

35. Can you identify YOUR risk factors for heart disease?_____

_____

_____

_____

_____

APPENDIX B

Informed Consent

INFORMED CONSENT

TITLE OF STUDY: Gender Differences: Making the decision to seek treatment for symptoms of acute myocardial infarction

Principal Investigator: Catherine A Borski (Supervisor Folsom Fitness & Rehab Center, MPH student University of North Texas Health Science Center Fort Worth)

I. PURPOSE

The purpose of this study is to determine whether there are gender differences in how men and women respond to symptoms of acute myocardial infarction (AMI)/"heart attack" and whether these gender differences account for increased delay in women seeking treatment for their symptoms. Through a better understanding of the psychological processes used to make the decision to seek medical care, possible points of intervention in the process of symptom and sign recognition, evaluation and management can be delineated.

II. DESCRIPTION OF PROCEDURE

As a post-MI patient meeting the inclusion criteria for this study I will be seen by the Principal Investigator and will be asked a series of questions regarding my response to symptoms of a myocardial infarction (heart attack). This interview will take from 30 minutes to 45 minutes to complete.

III. REASONABLY FORESEEABLE RISKS AND DISCOMFORT

This research study poses no new risks to me over and above any risks presented by the medications and/or procedures prescribed by my physician(s), which risks and/or discomforts have been described to me by my physician(s). However, there is the possibility of reappraisal of the symptom experience, self recrimination, and awareness of thoughts or feelings I may not have realized if the experience has not been shared with anyone.

IV. POTENTIAL BENEFITS

It is not possible to predict whether any personal benefit will result from entering the study. However, the possible benefits of this study include provision of the opportunity for ventilation, and supportive listening about my experience. Society in general, will benefit through the enhancement of early intervention/treatment of individuals with AMI symptoms, thereby decreasing morbidity and mortality in AMI.

1

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V. ALTERNATIVES

The alternative to this study is not to answer the series of questions asked via an interview. I will still receive the medication(s) and/or procedure(s) my physician(s) prescribe(s) and will receive separate information and instructions regarding each of these.

VI. INJURY RESULTING FROM RESEARCH

If anxiety, distressing thoughts or feelings occur as a result of self disclosure, I am to contact my physician right away. My physician will make available or arrange for appropriate care or treatment for psychological injury occurring during this study. However, there are no plans for the study sponsor, Physician, or hospital to pay for such care and treatment of my injury resulting from participation in the study. Rather, my insurance company, third party payor, and I will remain financially responsible for such care.

VII. VOLUNTARY PARTICIPATION

Whether or not I take part in the study will not affect my relations with my physicians, nurses, or hospital. If I decide to take part in this study, I am free to stop at any time.

VIII. CONFIDENTIALITY

My record of participation in the study will be kept confidential and protected to the extent provided by law. Results of this research may, however, be published. Published reports will not include my name or any other personally identifiable information. By signing this form I consent to the review and release of my record of participation in this study consistent with the foregoing.

IX. CONTACT

The principal investigator may be contacted to answer any questions I may have about this study. In case such questions arise, I can contact the principal investigator at (214) 947-1893. I can also call a Methodist Medical Center Institutional Review Board representative at (214) 947- 3500, or Jerry McGill Ph.D., Chairman Institutional Review Board, University of North Texas Health Sciences Center at Fort Worth, (817) 735-2561 if I have any questions, comments, or concerns about the study and my rights as a research participant.

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X.   CONSENT

I understand all of the information on this form, and consent to participate in this study.

_____   _____
Name (please print)   Witness (please print)

_____   _____
Signature of patient   Signature of Witness

_____   _____
Date   Signature of Investigator

Copy of consent given to patient _____
                                            patient initials

3

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