The Relationship Between the Perception of Nurse Caring, and the Phase II Cardiac Rehabilitation Patients’ Depression, Anxiety, and Adherence

A DISSERTATION

Submitted to the Faculty of the School of Nursing Of The Catholic University of America In Partial Fulfillment of the Requirements For the Degree Doctor of Philosophy

By

Jo Ann G. Kim

Washington, D.C.

2013
The Relationship Between the Perception of Nurse Caring and the Phase II Cardiac Rehabilitation Patient’s Depression, Anxiety, and Adherence

Jo Ann G. Kim, Ph. D., RN

Director: Janice Agazio, Ph. D., CRNP, R. N.

The purpose of this study was to determine if there was a relationship between perception of nurse caring and Phase II cardiac rehabilitation (CR) participant’s depression, anxiety, and adherence. Duffy and Hoskins (2003) Quality-caring model was used as a theoretical framework to guide the descriptive correlational study. A convenience sample of 109 outpatients lived in the mid-Atlantic portion of the United States. The four data collection instruments included the Center for Epidemiological Studies-Depression Scale (CES-D), State-Trait Anxiety Inventory- Y-1 (STAI-Y-1), Caring Assessment Tool-IV (CAT-IV), and a Phase II CR Patient’s Program Data Sheet. Pearson’s product-moment correlational analysis was used to determine the relationship between participants’ perceptions of nurse caring, depression, anxiety, and adherence. Findings: a) the perception of nurse caring had an inverse relationship with depression ($r = -0.22, p = 0.05$ one-tailed); b) the perception of nurse caring had an inverse relationship with anxiety ($r = -0.18, p = 0.05$ one-tailed); c) the perception of nurse caring did not have a direct relationship with adherence ($r = 0.09, p = 0.05$ one-tailed); d) there was a strong correlation between depression and anxiety ($r = 0.75, p = 0.05$ one-tailed); e) there was a small inverse relationship between depression and adherence ($r = -0.26, p = 0.05$ one-tailed). Pearson product-moment correlational analysis was also completed to determine the relationship between participants’ perception of nurse caring based on eight nurse caring factors (Duffy, Hoskins, & Seifert, 2007). Data suggested that seven nurse caring factors were identified by participants: a) Mutual Problem solving, b) Attentive Reassurance, c) Human Respect, d) Encouraging Manner, e) Healing Environment, f) Affiliation Needs, and g) Basic Human Needs.
This dissertation by Jo Ann G. Kim fulfills the dissertation requirement for the doctoral degree in nursing approved by Janice Agazio, Ph. D. as Director, and by Janet Merritt, Ph. D., and Petra Goodman, Ph. D. as Readers.

Janice Agazio, Ph. D., CRNP, R. N., Director

Janet Merritt, Ph. D., APRN-BC, R.N., Reader

Petra Goodman, Ph. D., WHNP-BC, R.N., Reader
# TABLE OF CONTENTS

**TITLE PAGE**
**ABSTRACT**
**SIGNATURE PAGE**
**LIST OF FIGURES**
**LIST OF TABLES**
**LIST OF APPENDICES**
**ACKNOWLEDGEMENT**

## CHAPTER I

**The General Problem**
- Framingham Heart Study ........................................... 1
- Cardiac Risk Factors ............................................. 3
- Cardiac Rehabilitation ........................................... 4

**Variables**
- Depression .................................................. 15
- Anxiety ....................................................... 16
- Adherence ..................................................... 18
- Nurse Caring .................................................. 20

**Theoretical Framework** ........................................ 24

**The Specific Problem** ........................................ 29

**Statement of the Problem** ..................................... 30

**Statement of the Purpose** ..................................... 30

**Research Questions** ........................................... 30

**Definitions of Terms** .......................................... 31
- Depression .................................................. 31
- Anxiety ....................................................... 31
- Cardiac Rehabilitation ........................................ 32
- Adherence ..................................................... 32
- Nurse Caring .................................................. 33

**Hypotheses** .................................................... 33
- Research Hypotheses ........................................ 33
- Statistical Hypotheses ....................................... 34
- Assumptions .................................................. 34

**Significance of Study** ....................................... 34

**Limitations of the Study** ................................... 35

**Summary** ...................................................... 35

## CHAPTER II

**Review of the Literature** .................................... 36
- Cardiovascular Disease ....................................... 36
- Emotions and Cardiovascular Disease ....................... 42
- Depression, Phase II Cardiac Rehabilitation, and Cardiovascular Disease .......... 48
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety and Phase II Cardiac Rehabilitation</td>
<td>53</td>
</tr>
<tr>
<td>Nurse Caring</td>
<td>61</td>
</tr>
<tr>
<td>Adherence</td>
<td>68</td>
</tr>
<tr>
<td>Significance</td>
<td>71</td>
</tr>
<tr>
<td><strong>CHAPTER III</strong></td>
<td></td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>73</td>
</tr>
<tr>
<td>Research Questions</td>
<td>73</td>
</tr>
<tr>
<td>Statement of the Purpose</td>
<td>73</td>
</tr>
<tr>
<td>Hypotheses</td>
<td>74</td>
</tr>
<tr>
<td>Research Hypotheses</td>
<td>74</td>
</tr>
<tr>
<td>Statistical Hypotheses</td>
<td>74</td>
</tr>
<tr>
<td><strong>Methodology</strong></td>
<td>74</td>
</tr>
<tr>
<td>Research Design</td>
<td>74</td>
</tr>
<tr>
<td>Setting</td>
<td>75</td>
</tr>
<tr>
<td>Sample</td>
<td>75</td>
</tr>
<tr>
<td>Selection Criteria</td>
<td>75</td>
</tr>
<tr>
<td>Sample size</td>
<td>75</td>
</tr>
<tr>
<td><strong>Instrumentation</strong></td>
<td>76</td>
</tr>
<tr>
<td>Center for Epidemiological Studies-Depression (CES-D)</td>
<td>76</td>
</tr>
<tr>
<td>State-Trait Anxiety Instrument (STAI-Y-1)</td>
<td>78</td>
</tr>
<tr>
<td>Phase II Cardiac Rehabilitation Participant’s Data Sheet</td>
<td>81</td>
</tr>
<tr>
<td>Caring Assessment Tool – Version IV (CAT-IV)</td>
<td>81</td>
</tr>
<tr>
<td><strong>Protection of Human Subjects</strong></td>
<td>83</td>
</tr>
<tr>
<td>Procedure</td>
<td>85</td>
</tr>
<tr>
<td>Pilot Study</td>
<td>88</td>
</tr>
<tr>
<td>Data analysis</td>
<td>88</td>
</tr>
<tr>
<td>Summary</td>
<td>89</td>
</tr>
<tr>
<td><strong>CHAPTER IV</strong></td>
<td></td>
</tr>
<tr>
<td>Findings</td>
<td>90</td>
</tr>
<tr>
<td>Description of the Participants</td>
<td>90</td>
</tr>
<tr>
<td>Gender and Age in Years</td>
<td>91</td>
</tr>
<tr>
<td>Primary Diagnosis</td>
<td>91</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>92</td>
</tr>
<tr>
<td><strong>Evaluation of Instruments</strong></td>
<td>93</td>
</tr>
<tr>
<td>Center for Epidemiological Studies-Depression (CES-D)</td>
<td>94</td>
</tr>
<tr>
<td>State-Trait Anxiety Instrument (STAI-Y-1)</td>
<td>95</td>
</tr>
<tr>
<td>Caring Assessment Tool – Version IV (CAT-IV)</td>
<td>97</td>
</tr>
<tr>
<td>Adherence</td>
<td>101</td>
</tr>
<tr>
<td>Summary of Instrument Data</td>
<td>102</td>
</tr>
<tr>
<td>Hypotheses Testing</td>
<td>102</td>
</tr>
<tr>
<td>Zero Order Correlation</td>
<td>103</td>
</tr>
<tr>
<td>Additional Findings</td>
<td>104</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression, Anxiety, and Adherence</td>
<td>104</td>
</tr>
<tr>
<td>Regression</td>
<td>104</td>
</tr>
<tr>
<td>Caring Assessment Tool-IV 36-items</td>
<td>105</td>
</tr>
<tr>
<td>Summary</td>
<td>109</td>
</tr>
<tr>
<td>CHAPTER V</td>
<td></td>
</tr>
<tr>
<td>Summary, Discussion, Conclusions, Implications, Recommendations</td>
<td>110</td>
</tr>
<tr>
<td>Summary</td>
<td>110</td>
</tr>
<tr>
<td>Discussion</td>
<td>112</td>
</tr>
<tr>
<td>Pilot</td>
<td>112</td>
</tr>
<tr>
<td>Issues</td>
<td>112</td>
</tr>
<tr>
<td>Reliability of the instruments</td>
<td>114</td>
</tr>
<tr>
<td>Hypotheses</td>
<td>116</td>
</tr>
<tr>
<td>Serendipitous Findings</td>
<td>120</td>
</tr>
<tr>
<td>Depression and Anxiety</td>
<td>121</td>
</tr>
<tr>
<td>Depression and Adherence</td>
<td>121</td>
</tr>
<tr>
<td>Comorbidity and Primary Diagnosis</td>
<td>122</td>
</tr>
<tr>
<td>Participants’ Perceptions of Nurse Caring and Eight CAT-IV Factors</td>
<td>123</td>
</tr>
<tr>
<td>Factor I, Mutual Problem Solving</td>
<td>123</td>
</tr>
<tr>
<td>Factor II, Attentive Reassurance</td>
<td>125</td>
</tr>
<tr>
<td>Factor III, Human Respect</td>
<td>127</td>
</tr>
<tr>
<td>Factor IV, Encouraging Manner</td>
<td>129</td>
</tr>
<tr>
<td>Factor VI, Healing Environment</td>
<td>131</td>
</tr>
<tr>
<td>Factor VII, Affiliation Needs</td>
<td>133</td>
</tr>
<tr>
<td>Factor VIII, Basic Human Needs</td>
<td>134</td>
</tr>
<tr>
<td>Conclusion of Findings</td>
<td>136</td>
</tr>
<tr>
<td>Implications for Nursing</td>
<td>136</td>
</tr>
<tr>
<td>Nursing Practice</td>
<td>137</td>
</tr>
<tr>
<td>Nursing Education</td>
<td>140</td>
</tr>
<tr>
<td>Nursing Research</td>
<td>144</td>
</tr>
<tr>
<td>Nursing Policy</td>
<td>146</td>
</tr>
<tr>
<td>Recommendations</td>
<td>148</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>150</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>169</td>
</tr>
<tr>
<td>LETTERS OF PERMISSION</td>
<td>218</td>
</tr>
</tbody>
</table>

Center for Epidemiological Studies-Depression (CES-D)  
State-Trait Anxiety Instrument (STAI-Y-1)  
Caring Assessment Tool – Version IV (CAT-IV)  
National Institute of Health-Certificate of Completion-Protecting Human Research Participants
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure 1</th>
<th>The Quality-caring model©</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>28</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Watson’s ten clinical caritas processes</td>
<td>23</td>
</tr>
<tr>
<td>2 Frequency Distribution: Primary Diagnoses</td>
<td>92</td>
</tr>
<tr>
<td>3 Frequency Distribution: Comorbidity Categories</td>
<td>93</td>
</tr>
<tr>
<td>4 Descriptive and Test Item Statistics for the CES-D</td>
<td>95</td>
</tr>
<tr>
<td>5 Descriptive and Test Item Statistics for the STAI-Y-1</td>
<td>96</td>
</tr>
<tr>
<td>6 Highest and Lowest Mean Scores for STAI-Y-1</td>
<td>97</td>
</tr>
<tr>
<td>7 Descriptive and Test Item Statistics for CAT-IV</td>
<td>99</td>
</tr>
<tr>
<td>8 Highest and Lowest Total Mean Scores: CAT-IV</td>
<td>100</td>
</tr>
<tr>
<td>9 Frequency Distribution: Adherence</td>
<td>101</td>
</tr>
<tr>
<td>10 Zero Order Correlation Matrix for Study Variables</td>
<td>103</td>
</tr>
<tr>
<td>11 Summary of Stepwise Regression with CAT-IV score as the Dependent Variable</td>
<td>105</td>
</tr>
<tr>
<td>12 Independent Variables with CAT-IV scores as Dependent Variable</td>
<td>105</td>
</tr>
<tr>
<td>13 CAT-IV Item Analysis: Depression, Gender, and Age Cohort</td>
<td>107</td>
</tr>
<tr>
<td>14 CAT-IV Item Analysis: Anxiety, Gender, and Age Cohort</td>
<td>108</td>
</tr>
<tr>
<td>15 CAT-IV Item Analysis: Adherence, Gender, and Age Cohort</td>
<td>109</td>
</tr>
</tbody>
</table>
**LIST OF APPENDICES**

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix A</td>
<td>Center for Epidemiological Studies-Depression (CES-D)</td>
<td>150</td>
</tr>
<tr>
<td>Appendix B</td>
<td>State-Trait Anxiety Inventory-Y-1 (STAI-Y-1)</td>
<td>153</td>
</tr>
<tr>
<td>Appendix C</td>
<td>Phase II Cardiac Rehabilitation Participant Data Sheet</td>
<td>155</td>
</tr>
<tr>
<td>Appendix D</td>
<td>Caring Assessment Tool-Version IV (CAT-IV)</td>
<td>157</td>
</tr>
<tr>
<td>Appendix E</td>
<td>Script for Phase II Cardiac Rehabilitation Staff for Orientation</td>
<td>161</td>
</tr>
<tr>
<td>Appendix F</td>
<td>Informed Consent at The Catholic University of America</td>
<td>163</td>
</tr>
<tr>
<td>Appendix G</td>
<td>Advertisement</td>
<td>167</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

I would like to express my thanks and deepest appreciation to faculty, advisors, and my dissertation committee: Dr. J. Agazio, Dr. J. Merritt, Dr. P. Goodman, Dr. J. R. Duffy, Dr. B. Soniat, Dr. P. Mc Mullen, Dr. J. Toth, and Dr. S. Abu-Bader. To my friends, sons, and neighbors: Jeanne, Lyn, Carol, Ron, Drew, Amanda, Paul, Amanda, and Ronda for listening, personal stories, and knowing when it was time for a break. Pastors G. Gaines-Cirelli and D. Stetler, as well as the Angel Gang, for your words of encouragement and support. I would also like to express my appreciation to the individuals in the local community groups that provided financial support and words of encouragement: Maryland Nurses Association-District 5, District of Columbia- Maryland League for Nursing, Business and Professional Women of Northern Maryland, and Zonta International. My warmest thanks go to my very best friend and supporter, Henry my husband; for without your love, tolerance, and continuous encouragement. I know this dream would have never been completed without you. For all of these blessings, I give thanks to God.
CHAPTER 1

The General Problem

In 2008, the American Heart Association (AHA) reported that over 80 million individuals or 37% of the adult population had at least one type of cardiovascular disease (CVD) (Rosamond et al., 2008). Encouragingly, the United States (U.S.) government statistics revealed that the death rate related to CVD peaked in the mid-1960s (U. S. Department of Health and Human Services [DHHS], 2000). However, the explosive increase in obesity, type II diabetes, and survival after an acute stage of a cardiac disease, put patients at a “higher risk of another heart attack, sudden death, angina, and heart failure” (Rea et al., 2004, p. 447). These factors also contribute to CVD remaining the number one health concern for healthcare agencies and the cause of disability for Americans (Thom et al., 2006).

In the early 1900’s the general medical practitioner provided advice for patients with a cardiac disease. As knowledge expanded, specialty care emerged called cardiology with a primary emphasis on treating myocardial infarctions (Newman, Andrews, Koblish, & Baker, 1952). Today, clinical cardiology includes diagnoses such as angina pectoris, myocardial infarction (MI), pericarditis, aortic dissection, valvular disorder, pulmonary hypertension, heart failure, infective endocarditis, cardiac tamponade, systemic arterial hypertension, hypertrophic cardiomyopathy, and tumors of the heart (Chizner, 2007). By using multiple medications and non-pharmacological techniques that include surgeries and interventional cardiac procedures, healthcare providers and their cardiac teams address hypertension, arrhythmias, hyperlipidemia, angina, and progression of atherosclerotic vascular disease across the lifespan of Americans with a concentration of services that help the elderly and recently the youth of America (Braunwald,
have contributed to the increase in the gross domestic product (GDP). In 2007, the percent of GDP spent on health care was 17% or $2.4 trillion, and is predicted to rise to 20% by 2016 (National Coalition, 2009; Poisal et al., 2007). The Center for Disease Control and Prevention (CDC) estimates the health expenditures (direct costs, which include physicians and other healthcare providers, hospital and nursing home services, medications, home health care, and other medical durables) and lost productivity resulting from morbidity and mortality (indirect costs) for CVD is estimated at $448.5 billion or 3.18% of the GDP (Rosamond et al., 2008, e137).

During the 1940’s, physicians noted that some patients with specific symptoms such as hypertension and hypercholesterolemia seemed to develop CVD faster than other patients did; but the physicians could not decide if this was a disease process or simply a natural phenomenon of aging (Dawber, 1980). The physicians were unsure these observations were nothing more than artifacts, especially when a healthy looking person suddenly died. To compound physicians’ frustration, they witnessed a lack of improved life expectancy in the previous 100 years even though they were using the best methods of medical practice available to them. These medical leaders in the late 1940’s encouraged the U.S. Congress to finance a large research study that could provide discerning information to be used to diagnosis CVD (Dawber, 1980).

With Congress’ approval and financing, the U.S. government’s National Institutes of Health (NIH) organized the landmark Framingham Heart Study in 1948, which was lead by physician and researcher, Dawber (National Heart Lung & Blood Institute [NHLBI], 2007).
Multiple healthcare providers’ subjective findings provided the federal researchers with suspected CVD risk factors and potential causes. Therefore, the researchers’ goal was to provide statistics on prevalence and incidence of risk factors and CVD to persuade clinicians to advise patients to change patient’s cardiac risk behaviors or the environment, in order to modify, or eliminate CVD (Dawber, 1980).

**Framingham Heart Study**

The Framingham Heart Study is now the longest running comprehensive multi-generational heart disease investigation in the world (NHLBI, 2007). Clinical epidemiologist from the National Heart, Lung, and Blood Institute consider it the gold standard for cardiovascular epidemiology (Jaquish, 2007). The original statistical results highlighted three major cardiac risk factors: Hypercholesterolemia, hypertension, and cigarette smoking for the original 5,209 subjects. The subjects were divided by age groups and gender (Kannel & Gordon, 1970). Other Framingham, Massachusetts volunteer’s CVD descriptive characteristics were glucose intolerance, excess weight, hyperlipidemia, physical inactivity, hormone changes with menopause, male gender, and excess alcohol intake.

The original subjects of the Framingham Heart Study and their families continue to receive physical examinations and answer questionnaires that have helped identify additional contributing characteristics for people with CVD (NHLBI, 2007). More recently, the following have been found to be related to CVD: cocaine use, multiple comorbidities, severity of illness, and psychosocial factors (Rosamond et al., 2008; Framingham, 2006).
Cardiac Risk Factors

As the Framingham Study progressed, healthcare providers determined that many of the conditions related to CVD were things that people could change in their life that would prevent or delay debilitating cardiac symptoms (Braunwald, 1997). The factors that people could not change in their life became known as non-modifiable coronary risk factors (Rosamond et al., 2008).

Non-modifiable Cardiac Risk Factors. Non-modifiable cardiac risk factors are things that are not controlled by the patient’s current behaviors including age, gender, ethnicity, and genetics. Increased incidences of CVD have been noted as the individual’s age increases. Initially, this was found in men (Dawber, 1980). However, current research reveals that as women experience menopause, or have a surgical procedure that causes estrogen change, the risk for heart disease become equal to men (Mosca et al., 2007).

In recent analysis, CVD in the patient’s family and ethnicity continue to be associated with an increase of occurrence in CVD, but scientists believe these are related to genetic markers, and past environmental exposures such as cigarette smoke, food desires, and activity levels that, in turn, influence the person’s risk for developing hypercholesterolemia, hypertension, diabetes, and obesity (American Heart Association [AHA], 2009). At this time, a specific genetic marker has not been found for CVD. However, scientists continue to explore the multifactorial nature of atherosclerosis that is believed to lead to CVD, and the role that genes play in altering lipid metabolism, coagulation, the renin-angiotensin pathway, vascular injury, infections, and inflammation (Khurana, Simons, Martin, & Zachary, 2005; Lamon & Hajjar,
Scientists also suspect the activated genes found in patients with CVD share pathways in neuroendocrine functions, depression, and anxiety (McCaffery et al., 2006).

**Modifiable Cardiac Risk Factors.** Statistical findings on what causes cardiac risk factors to change have led to preventive and corrective practices that individuals can do to change their specific cardiac risk factor (U.S. DHHS, 2000). These practices or treatments have become known as modifiable cardiac risk factors. Modifiable cardiac risk factors include hypertension, hypercholesterolemia, stress, tobacco use, nutritional imbalance, alcohol and drug intake, and sedentary lifestyle (AHA, 2009).

**Hypertension and hypercholesterolemia.** When an individual adheres to the prescribed exercise, nutrition, medication, and healthcare services available in America, hypertension and hypercholesterolemia are highly treatable conditions, thus considered modifiable risk factors (Balady et al., 2007). Comorbidities that compound complications with hypertension and hypercholesterolemia include diabetes, metabolic syndrome, stroke, thyroid dysfunction, chronic obstructive pulmonary diseases, gastric reflux, arthritis, cancer, peripheral arterial disease, venous thrombosis, chronic renal insufficiency, and psychosocial conditions such as depression, and anxiety (Rosamond et al., 2008).

**Stress.** Individuals are encouraged to use stress management techniques to reduce their blood pressures, heart rates, and inflammation of the arteries (Rozanski, Blumenthal, Davidson, Saab, & Kubzansky, 2005). In one study by Blumenthal et al. (1997), the researchers followed 107 patients with coronary artery disease (CAD), which is one of nine categories of CVD, for a mean of 38 ± 17 months after randomization to an exercise group, stress management group, or control group who received usual medical care. Blumenthal et al. (1997) found that stress
management was associated with a statistically significant reduced risk in participants with CAD when compared to the control group. The exercise group did not reach statistical significance, but the risk was lower than the controls. “Stress management was also associated with reduced ischemia induced by mental stress and ambulatory ischemia. The data suggested behavioral interventions offered additional benefits over and above usual medical care in cardiac patients” (Blumenthal et al., 1997, p. 2223).

**Tobacco use.** Tobacco use is another modifiable risk factor. With guidance from the American Lung Associations (ALA) (2007) and the Joanna Briggs Institute (2001), outpatient programs use best practices for smoking cessation of cigarettes. The ultimate goal for cardiac patients is to abstain from all tobacco and nicotine products including cigars and chew. The ALA guidelines include a multifaceted approach of pharmacotherapy, nicotine replacement and anti-depressants, behavior modification and motivational strategies, individual counseling and support groups, self-help materials, aversion therapy, and relapse prevention based on the *Stages of change theory* (Bazzano, He, Muntner, Vupputuri & Whelton, 2003; Prochaska, Norcross, & DiClemente, 1994).

**Nutritional imbalance.** NHLBI (2000) guidelines recommend individualized nutritional plans to normalize a CVD patient’s weight, in addition to reducing cholesterol and glucose levels to normal values. Four measures for weight status are recommended by the NHLBI (2000). The first two measures are height and weight. These are used to calculate the third measure, body mass index (BMI), an indicator used to screen for body fat (Centers for Disease Control and Prevention [CDC], 2009). A BMI between 18.5 and 24.9 indicates a healthy weight. The fourth measurement is a tape measurement of the waist circumference. A man whose waist
circumference is more than 40 inches or 102 centimeters (cm) or a non-pregnant woman whose waist circumferences is more than 35 inches or 88 cm is considered a high risk for obesity-related conditions including CVD (NHLBI, 2000).

**Alcohol and drug intake.** Because excess alcohol consumption can lead to cardiomyopathies, it is recommended that alcohol intake to be limited to one drink or less per day for women and two drinks or less per day for men (U. S. Department of Agriculture, 2005). In addition, alcohol drinks contain non-nutritional calories that overweight patients may need to modify to obtain a healthy weight (NHLBI, 2000).

More recently, abstinence from street drugs is encouraged. Cocaine has been found associated with myocardial infarction, dilated cardiomyopathy, accelerated atherosclerosis, myocarditis, and contraction-band necrosis (Rezkalla & Kloner, 2007). Likewise, marijuana has been linked to atrial fibrillation, tachycardia, and hypotension (Rezkalla, Sharma, & Kloner, 2003).

**Sedentary lifestyle.** Based on descriptive sedentary lifestyle findings found during the Framingham Heart Study, cardiologists began working with experts in exercise physiology to develop exercise guidelines (Oguma & Shinoda-Tagawa, 2004). By 1978, American College of Sports Medicine (ACSM) recommended that a healthy adult exercise three to five days per week, at an intensity of 60% to 90% of their maximum heart rate, for a duration of 15 to 60 minutes per training session of rhythmical and aerobic use of large muscle groups. These activities included running or jogging, walking or hiking, swimming, skating, bicycling, rowing, cross-country skiing, rope skipping, and various endurance games or sports (ACSM, 1978).
Today, CDC (2008) recommends moderate exercise (perceived by the exercising individual as a five on a scale of zero to ten) for 150 minutes per week. The current exercise practices promote aerobic gain with relatively no pain (CDC, 2008). The guidelines suggest daily exercise, but a person is allowed to break each session into ten-minute intervals or to combine sessions. For individuals who chose to walk slowly instead of at a moderate pace, the 10,000 step program has been implemented, which may take the individual longer to exercise, but provides for adequate energy expenditure. A second component of the current CDC guidelines is muscle-strengthening activities on two or more days a week starting with one set of eight repetitions for each exercise. Lifting weights and working with resistance bands as well as push-ups and sit-ups are common strengthening exercises. CDC also recognizes gardening as well as yoga as providing strengthening benefits. The third component of the current CDC guidelines includes stretching exercises that individuals often incorporate into their ten minutes of cool down at the end of each exercise session (CDC, 2008).

**Cardiac Rehabilitation**

To help patients with CVD make lifestyle changes, healthcare providers developed prevention programs to decrease disabilities, modify cardiac risk factors, and to prevent further extensions of CVD. The major prevention program for CVD became known as cardiac rehabilitation (CR) (American Association of Cardiovascular and Pulmonary Rehabilitation [AACVPR], 2004). The U. S. Public Health Service used the 1988 research done by...
Feigenbaum and Carter to define cardiac rehabilitation (CR) and initiate the program’s design to facilitate recovery from a disability related to a cardiovascular disease:

Cardiac rehabilitation services are comprehensive, long-term programs involving medical evaluations, prescribed exercise, cardiac risk factor modification, education and counseling. These programs are designed to limit the physiologic and psychosocial effects of cardiac illness, reduce the risk for sudden death or reinfarction, control cardiac symptoms, stabilize, or reverse the atherosclerotic process, and enhance the psychosocial and vocational status of selected patients (p. 90).

The services are divided into phases beginning during hospitalization (Phase 1), followed by a supervised ambulatory outpatient program lasting 3 months (Phase II). The phases of CR are described below starting with Phase I, the inpatient program (AACVPR, 2004).

**Phase I Cardiac Rehabilitation: Inpatient Services.** Starting in the 1930s and continuing through the 1960s, expert opinion and the results from the Framingham Heart Study stimulated the establishment of inpatient CR services in an attempt to initiate the healing process and decrease mortality (Oldham et al., 2005). This began as early as 1944 when Levine’s journal article discussed his doubts concerning the practice of prolonged bedrest post-myocardial infarction, the accepted practice at that time (Levine, 1944). The major focus of inpatient CR in the 1950s was restoration of functional capacity that started with passive range of motion given by the bedside nurse (AACVPR, 2004). This led to opportunities for patients to sit up in a chair (Levine & Lown, 1951). Later in 1952, Newman, Andrews, Koblish, and Baker (1952) published a physical therapy training aid to help patients progress in post-infarction recovery. This ultimately led to “early ambulation” of three to five minutes during the fourth week of the
typical twelve-week hospitalization at that time (Newman et al., 1952, p. 557). The early 20th century medical care for the cardiac patient was to promote healing entirely in the acute care hospital while receiving rehabilitation from the hospital bedside nurse (Pozen et al., 1977).

By 1957, Hellerstein and Ford in Cleveland, Ohio developed written guidelines for cardiac rehabilitation (CR) exercise centers (Hellerstein & Ford, 1957). Using these guidelines, Cain, Frasher, and Strivelman (1961), provided evidence that early graded activity programs were safe and, though not a standard, one-on-one educational counseling benefited the hospitalized patient. Thus, once patients were out of intensive care, they walked in their room while tethered to a cardiac monitor and met face-to-face briefly with the coronary care registered nurse to discuss a variety of cardiac topics (Cain et al., 1961).

As these practices of limited ambulation and sitting in chairs became more prevalent in the late 1960’s and 1970’s, researchers published their observations of the associations between physical activity and the patients’ improvements after a myocardial infarction. For example, Abraham, Sever, and Weinstein’s (1975) study reported that early ambulation was beneficial regardless of the heart condition, except for patients in acute crisis. Haskell (1978) gathered exercise data from 30 cardiac rehabilitation (CR) programs from 1960 to 1977. The combined data represented more than 1.5 million hours of observed exercise with a mortality rate of one death per 116,402 patient-hours of exercise. In addition, Pozen et al. (1977) provided evidence that specialized CR registered nurses were effective with providing educational information. However, the evidence that exercise and education prolonged life or decreased the risk of re-infarction remained equivocal (Van Camp & Peterson, 1988). Thus, Kannel and McGee (1979)
and Epstein (1979) continued to examine the ongoing Framingham Heart Study data to predict and explain cardiovascular disease morbidity and mortality.

However, even when the statistics from the Framingham Heart Study’s findings supported the clinical observations of earlier physicians, head NIH investigators considered the information weak and not generalizable since data collection was limited to Framingham, Massachusetts that had a relatively small population and reportedly unreliable death certificates (Lenfant, Friedman, & Thom, 1998). Nevertheless, many researchers such as Roberts and Jones (1979), and Roberts and Virmani (1979) found the statistics plausible and started necropsy investigations to determine the changes related to atherosclerosis in coronary artery disease. The pathological quantitative evidence led to recommendations for updating the prescribed treatments of cardiac drugs, exercise, and lifestyle changes for patients (Kannel, 1995).

Multiple factors have influenced the length-of-stay for Phase I cardiac rehabilitation patients. The introduction of a prospective payment system based on diagnosis related groups (DRGs) and the introduction of Health Maintenance Organizations that control hospitalization in favor of outpatient treatments contributed to the decrease in the number of inpatient days after 1983 (Sloss, Dhanani, O’Leary, Lopez, & Melnick., 2004). Other factors that contributed to decreased hospitalization included improved medications, percutaneous transluminal coronary artery (PTCA), angiograms, and stents, as well as reduced incidents of smoking, hypercholesterolemia, and hypertension (Bennett et al., 2006; Nallamothu, Young, Gurn, Pickens, & Safavi, 2007). Healthcare administrators and providers have monitored recovery of patients after an MI as related to the length of stay. Spencer, Lessard, Gore, Yarzebski, and Goldberg’s (2004) study of 4,551 patients after a MI determined there was no association
between the decreased length of stay and short-term mortality after hospital discharge. However, the reduced length of stay dramatically decreased the inpatient nurse-patient time and the initiation of the life-enhancing exercise and educational program (AACVPR, 2004).

As compared to the 1980’s, the length of hospitalization to rule out cardiac related chest pain has decreased from three days to 23 hours or less, and the average length of stay for recovery from an MI decreased from 12 days to between 3.4 to 6.2 days (CDC, 2006). Additionally, recuperation in the acute care hospital for coronary artery bypass surgery (CABG) has decreased from 16 days to 4.8 to 6.6 days (CDC, 2006; U. S. DHHS, 1987).

**Phase II Cardiac Rehabilitation: Outpatient Services.** Because of shorter hospitalization, early outpatient Phase II cardiac rehabilitation (CR) programs took on an added importance. The rehabilitation specialists transformed the Phase I CR program to brief periods of ambulation and survival educational topics such as knowing when to call for an emergency ambulance and initiating smoking cessation (AACVPR, 2004). Phase I CR discharge planning aimed to enroll the patient in an outpatient cardiac rehabilitation program called Phase II CR (AACVPR).

In the 1970s, the outpatient Phase II CR programs used the same exercise equipment and EKG monitoring as the historical inpatient Phase I CR programs. However, family physicians and cardiologists infrequently prescribed Phase II CR services since they saw the services as isolated with an inconsistent focus (Naughton, Hellerstein, & Mohler, 1973). Another factor that may have influenced a patient referral was that most health insurance policies did not pay for Phase II CR services (Social Security Act, 2009).
As a response to the Phase II cardiac rehabilitation (CR) program inconsistency, the American College of Cardiology, ACSM, and the AHA jointly developed standardized professional guidelines for exercise and educational topics offered by the Phase II CR professionals, in an attempt to meet the challenge of providing quality services (Pollack & Schmidt, 1995; Ehrman, Gordon, Visich, & Keteyian, 2003). Position papers were published on exercise conditioning (Leon et al., 1990), core competencies for CR professionals (Southard et al., 1994), and an outcome matrix to help assure implementation for complete assessments for each patient (Sanderson, Southard, & Oldridge, 2004). These tools continue to be used for each individual as they enter the Phase II CR program. In addition, a patient’s health history and head to toe physical examination is completed. Laboratory tests are reviewed and screening tools are used to assess lipids, hypertension, blood sugar, weight, physical activity, smoking, eating habits and nutrition intake, and psychosocial issues (Herridge, Stimler, Southard, & King, 2005; Sanderson et al., 2004). Individualized goals are discussed with the patient and family; then written with the needs of the patient in mind. A common nursing diagnosis is knowledge deficit with multiple reasons. The areas that are topics to be taught are: exercise parameters and progression, nutrition and weight management, smoking cessation, sleep hygiene, psychosocial issues that include depression, anxiety, stress and other topics the patients wants to discuss (Sanderson et al., 2004).

In March 1981, the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) dedicated a journal to improve clinical practice by communicating educational, scientific, and professional topics to the members. The journal’s original name was the Journal of Cardiac Rehabilitation and evolved to the Journal of Cardiovascular and
In 1986, dedicated experts in cardiac rehabilitation organized the first annual AACVPR conference to provide members with face-to-face communications on scientific findings and educational offerings. More recently, the professional AACVPR website and e-mail communications allow for networking and sharing of current issues and best practices that support the healthcare professional in the clinical setting (Thompson & Bowman, 1997). By improving clinical practice of the multi-disciplinary team and promoting scientific inquiry, AACVPR continues to strive to strengthen the public health network to decrease morbidity, mortality, and disability by providing disease management during the Phase II cardiac rehabilitation (CR) program (AACVPR, 2009).

Criteria for Phase II CR eligibility. For this study, Phase II CR patients will be the subjects of interest. Customarily, for a patient with CVD to begin a Phase II CR program, a physician’s referral is written at the time of discharge from the hospital or at the first physician’s appointment two to eight weeks after a cardiac diagnosis or procedure (Pollock & Schmidt, 1995). The participants of this study are drawn from this group of patients with cardiovascular disease (CVD). Although exclusion criteria for Phase II CR includes unstable angina, hypotension, severe hypertension, or life-threatening arrhythmias related to ischemia (Pollock & Schmidt, 1995), with the rapid evolution of cardiac medications and surgical procedures for CVD, the demographics and the number of patients referred to Phase II CR over the last 15 years has increased by 28%. In 1999, researchers found that only 10% of eligible patients or 418,800 individuals attended Phase II CR programs (Dafoe & Huston, 1997; Kozak & Lawrence, 1999). Although the reasons for the lack of referrals were not documented, by 2005 research studies...
indicated that eligible patient referrals increased to 38% or 1,596,000 individuals (Singh, Schocken, Williams, & Starney, 2008; National Center for Health Statistics [NCHS], 2005).

The average age for both female and male patients attending Phase II cardiac rehabilitation (CR) is older than 65 years of age (Milani, Lavie, & Mehra, 2004). Thus, Medicare is the primary third party payer for the majority of patients seen in an American Phase II cardiac rehabilitation (CR) program. Medicare reimbursable cardiac diagnosis for cardiac rehabilitation includes myocardial infarction, peripheral vascular disease, coronary artery disease, atrial fibrillation, hyperlipidemia, congestive heart failure, mitral value regurgitation, aortic value regurgitation, hypertension, cardiomyopathy, and stable angina pectoris (Centers for Medicare & Medicaid Services [CMS], 2008). Phase II CR is also Medicare billable after cardiac procedures such as coronary artery bypass graft, cardiac pacemaker with or without internal cardiac defibrillators, angioplasty, percutaneous transluminal coronary artery with or without stents, heart transplant, and cardiac valve replacement (CMS, 2008). Phase II cardiac rehabilitation (CR) patients who do not have Medicare may or may not be covered by their private healthcare insurance or submit co-pays for services (United Health Care, 2009).

Variables

The next section will discuss the variables that will be studied in this research (depression, anxiety, adherence, and nurse caring) as related to the Phase II CR patient. Research to support the connection among these variables started as early as the 1970s when Wishnie, Hackett, and Cassem (1971) identified that 88% of cardiac patients experienced depression and anxiety at the time of their first MI. During the interviews at the first year
follow-up, the investigators reported that depression and anxiety symptoms continued. However, the investigators did not report if the patient’s has a history of anxiety or depression prior to the myocardial infarction.

These same mental health issues continue to affect medical patients including those with CVD to this day as suggested by DiMatteo, Lepper, and Croghan’s (2000) meta-analysis of 12 studies. The researchers searched for an association between the psychosocial behaviors (depression and anxiety) and adherence to prescribed treatments. The researchers found out of every 100 noncompliant patients, on average 63.5 were depressed compared with 36.5 not depression (instead of the 50/50 split that was expected if there was no relationship existed between adherence and depression). The findings were different for anxiety. Its relationship with adherence was considerably variable. The difference in the risk of noncompliance between anxious and nonanxious patients was four percent (DiMatteo, Lepper, & Croghan, 2000). A discussion of depression follows.

**Depression**

Depression is a common and serious illness that often occurs when a person has to live with a chronic condition such as heart disease (Wells, Golding, & Burnam, 1988). The Diagnostic and Statistical Manual of Mental Disorders IV-TR (DSM-IV-TR) describes an individual with depression as having a downcast demeanor, slowed body language, or a blank facial expression; a soft voice with little inflection, or muteness; irritability or agitation that may present as pacing, hand-wringer, or rubbing their skin. A patient may describe a sense of hopelessness, sadness, discouragement, worthlessness, guilt, anger, body aches, thoughts of death, an inability to make decisions or concentrate, a loss of interest in activities, or having to
exert a large amount of effort to achieve a goal. If these symptoms last longer than two weeks professions consider this a major depressive disorder (American Psychological Association [APA], 2000). Phase II CR patients diagnosed with depression and heart disease are congruent with this definition as they complain about sleep disturbances, low energy levels, sadness, loss of interest in activities, thoughts of death, poor concentration, and memory loss (Mayo, 2008).

By 2008, The National Institute of Mental Health (NIMH) estimated that 14.8 million adults or 6.7% of the U.S. general population met the criteria for a diagnosis of major depression (NIMH, 2008). In Valentine, Byers, and Peterson’s (2001) study that reviewed statistics, the authors estimated that 1.5 million outpatients treated with cardiac medications and those who had experienced at least one cardiac procedure had depression. The authors estimated that this was 0.7% of the 2001 general population (Valentine et al., 2001).

Thombs et al.’s (2008) research evaluated patients (n=425) with a diagnosis of acute coronary syndrome and ST elevated MIs for depressive symptoms while in the hospital and 12 months later. The patients were screened with the Beck’s Depressive Inventory (BDI) for depressive symptoms. The BDI scores range from 0-63. The authors of the BDI recommend a cut-off of “score ≥10 for at least mild symptoms of depression” (Beck, Steer, & Carbin, 1988, p. 77). Twenty percent (n=85) of the sample were found to have persistent BDI scores of ≥ 10 and had poorer general health or death in the following year (p<0.001), especially if the patient had not received treatment for their depression. Nine percent of the patients (n=38) were found to have transient depression with a BDI score of ≥ 10 while in the hospital that decreased to ≤10 at the 12 month re-evaluation “were not at risk for further physical health deterioration after the initial acute coronary syndrome” (Thombs et al., 2008, p. 15).
Anxiety

The DSM-IV-TR describes the diagnostic criteria for an anxiety disorder as apprehension, tension, nervousness, fear, and worry that are in response to the patient’s perception of a physical danger, psychological stress, an uncertain outcome, or the lack of competence to counteract a threat. Individuals experience sweating, headache, shaking limbs, elevated blood pressure, skin rashes, elevated heart rates, peptic ulcers, stuttering, and other bodily reactions which contribute to the individual’s self-doubts (APA, 2000). In addition, Spielberger (1983), a recognized psychologist who has specialized in anxiety since the late 1960s, suggests a patient perceives a real or imaginary threat that causes an unpleasant emotional arousal such as tension, or irritability.

NIMH (2008) estimated that 19 million Americans, 55 years or older are affected by anxiety. Moser and Dracup (1996) suggested that 15% Americans with cardiovascular disease (CVD) or 12 million of the 80 million CVD patients experience anxiety. These same researchers found that 48 hours after arriving at a hospital, a post-MI patients (n=86) had moderate to high levels of anxiety (1.1 ± 0.93) as measured on the Brief Symptom Inventory (BSI) tool. These CVD patients were “4.9 times more likely to have cardiac complications such as chest pain, reinfarction, sustained ventricular tachycardia, ventricular fibrillation, and in-hospital death” (Moser & Dracup, 1996, p. 395). According to the developers of the BSI tool (Derogatis, 1993), the score of 1.7 indicates elevated levels of anxiety that are often associated with psychiatric in-patients and that a reference score of 0.35 is closer to normal values for patients with less psychological stress. In addition, Moser and Dracup (1996), reported that 70% of the
post-MI patients scored above the 0.35 normal reference score and that 26% scored at or above 1.7 (Moser & Dracup, 1996).

Additional research studies conducted over the last two decades have reported mixed research findings for anxiety and CVD. In one study, Crowe, Runions, Ebbesen, Oldridge, and Streiner (1996) identified anxiety immediately after a myocardial infarction in 69% of the acute care cardiovascular disease inpatients. However, Lane, Carroll, Ring, Beevers, and Lip (2001) found no relationship between anxiety and the patient’s cardiac diagnosis of a myocardial infarction. Additionally, Welin, Lappas, and Wilhelmsen’s (2000) research suggested that anxiety could be beneficial as a short-term response since it motivated the patient to accomplish a task that was associated with improved survival.

Scientists have documented that anxiety scores can improve with targeted interventions. Barnum (1999) noted that anxiety decreased during the first few weeks of Phase II cardiac rehabilitation (CR) program, and the lower the anxiety the more rapidly the exercise improved. In another study Gavin, Bethell, and Turner (2000) documented that after a single Phase II CR exercise session, anxiety significantly reduced.

Beckie, Fletcher, Beckstead, Schoken, and Evans’ (2008) study suggested that the age of a woman influenced scores on the State Trait Anxiety Instrument (STAI), which was used to assess anxiety. The researchers divided 182 women into two cohorts by age, 64 years and less (n=92) versus older than 64 years (n= 90). Participants aged 64 or less had STAI scores with a mean average of 38.8 ± 13.4 verses 32.8 ± 10.6 for participants older than 64 years of age. The scientists did not speculate why these differences occurred.
Adherence

The definition for adherence, used by the World Health Organization (WHO) in 2003, emphasized the importance of agreed upon goals between the healthcare provider and patient that facilitated continuous patient actions to meet the goals even when the patient had limited supervision (Sabate, 2003). Redman (2001) prefers this term to compliance, because it promotes the patient as an active participant in the process instead of the paternalistic notion of obedience.

Adherence in a Phase II cardiac rehabilitation (CR) program may take the form of performing agreed upon actions such as specific exercises and smoking cessation. Adherence to the Phase II CR program allows an opportunity for the exchange of health related discussions between the members of the healthcare team and the patient while exercising in a safe environment as the patient adjusts to their new body image and improved physical stamina (Miller & Taylor, 1995).

The renowned Ontario cardiac rehabilitation researcher, Oldridge and colleagues (1983) has been involved in multiple studies concerning adherence. Starting with the data from the Ontario Exercise Heart Collaborative Study, smoking was determined as a consistent and statistically significant predictor for both recurrent myocardial infarction and poor adherence (Oldridge et al., 1983). The group of researchers also found that due to the complex nature of the individual’s cardiovascular disease, comorbidities, internal characteristics of the patient, cardiac risk factors, and medication side effects, no single technique was found to be effective in promoting adherence. Oldridge and Streiner (1990) continued to study the lack of adherence. They found that medical complications and changing home residences comprised 60% of the dropouts from the Phase II CR program, and 40% of the patients reported a lack of motivation,
lack of spousal support, or program inconvenience for non-adherence to the physician prescribed Phase II cardiac rehabilitation (CR) program (Oldridge & Steiner, 1990).

In addition, Oldridge (1995) found the definition for adherence was different from one study to another. Some researchers considered adherence if a patient attended 50% of the Phase II CR session while other researchers considered adherence only when the patient achieved 100% of the sessions. In this same report, Oldridge (1995) wrote that physicians were not consistent in ordering a fixed number of sessions for their patients. Some physicians would order 12 or 18 sessions while others would order 36 sessions based on their professional assessment of the patient since research had yet to support an optimal number of sessions.

Over twenty years later, adherence to Phase II CR programs continue to be a problem. Yohannes, Yalfani, Doherty, and Bundy (2007) found that over 20% of the 21st century patients continued to drop out even though healthcare providers have made steps to changing the Phase II CR program barriers that were originally identified in Oldridge’s (1995) publication.

**Nurse Caring**

Philosophy professor Mayeroff’s (1971) reflections on caring describe what he called intertwined “major ingredients” (p.9). The obligation from the healthcare provider is based on devotion to the patient and knowledge about caring, which allows for alternating rhythms of the patient’s moods and actions. Mayeroff called this “participatory patience” (p. 12), where the carer gives of them self, trusts the patient, provides honesty, humility, hope, courage, and allows caring to build from within for both the caregiver and the care recipient.
Mayeroff (1971) wrote:

To help another person grow is at least to help him to care for something or someone apart from himself, and it involves encouraging and assisting him to find and create areas of his own in which he is able to care. In addition, it is to help that other person to care for himself, and by becoming responsive to his own needs, to care to become responsible for his own life (p.7).

Watson (1979) drew her Human caring theory from psychologists such as Mayeroff (1971), Giorgi (1970), and Koch (1969). She also included works from multiple nurses such as Nightingale (1860), Leininger (1988a), Johnson (1978), King (1971), Abdellah (1969), Parse (1981), Peplau (1952), Hall (1964), Henderson (1964), Roy (1976), and Rogers (1970). In addition, she utilized physiological concepts from Stress theory authored by Selye (1950) and Lazarus (1966), as well as concepts from Western and Eastern philosophers (Watson, 1999).

Watson (2005) specifically chose the word “caritas” to expand the understanding of caring to include the unlimited loving-kindness that a professional nurse offers in an unselfish manner in interpersonal and transpersonal relationships (p.3). Watson (2006) developed ten clinical caritas processes to describe the relationship between the nurse and patient (see Table 1).

Within the last two decades, nursing research began to clarify the ten clinical caritas processes by developing instruments to measure the concepts and assumptions. Three cardiac studies have been published. Cronin and Harrison (1988) used their Caring Behavior Assessment instrument (CBA) when assessing nurse caring by the post-myocardial infarction patients. Gay (1999) used the Caring Behavior Inventory developed by Wolf (1986) to study the importance of nurse caring to 18 cardiac inpatients. Later, Wolf,
Miller, and Devine (2003) found that patient satisfaction scores increased with 73 patients who underwent invasive cardiac procedures when nurse caring scores were high.

Table 1

Watson’s ten clinical caritas processes

1. Practice of loving-kindness and equanimity within context of caring consciousness
2. Being authentically present, and enabling and sustaining the deep belief system and subjective life world of self and one-being-cared-for
3. Cultivation of one’s own spiritual practices and transpersonal self, going beyond ego self
4. Developing and sustaining a helping-trusting, authentic caring relationship
5. Being present to, and supportive of the expression of positive and negative feelings as a connections with deeper spirit of self and the one being cared for
6. Creative use of self and all ways of knowing as part of the caring process; to engage in artistry of caring-healing practices
7. Engaging in genuine teaching-learning experience that attends to unity of being and meaning attempting to stay within other’s frame of reference
8. Creating healing environment at all levels, (physical as well as non-physical, subtle environment of energy and consciousness, whereby wholeness, beauty, comfort, dignity, and peace are potentiated
9. Assisting with basic needs, with an intentional caring consciousness, administering ‘human care essentials’, which potentiate alignment of mind-body-spirit, wholeness, and unity of being in all aspects of care”;
tending to both embodied spirit and evolving spiritual emergence
10. Opening and attending to spiritual-mysterious, and existential dimensions of one's own life-death; soul care for self and the one-being-care-for.

In 1992, Campbell’s research provided the first evidence that a physician’s verbal face-to-face recommendation, instead of a silently written note, motivated patients to attend a Phase II cardiac rehabilitation (CR) program. Additional research suggested the role of the registered nurses (RN) and physicians are collaborative partners in helping the patient achieve health lifestyle goals, more recently called patient outcomes. Rose (1991) found that the daily duties of a RN plays a key supportive role when motivating healthy behaviors. Furthermore, Duffy (2002) found a relationship between nurse caring and patient outcomes, and coined the term nurse-sensitive outcomes, since the description of the behaviors, skills, experiences, knowledge, and attitude of the nurse influenced the patients’ outcomes. The research findings from the 1990s and the early 20th century helped the theorist elaborate on collaborative and independent caring relationships with patients and healthcare providers to accomplish a patient’s goal (Duffy & Hoskins, 2003). Duffy and Hoskins (2003) Quality-Caring model© is the theoretical framework used to guide this study. The model is described below.

Theoretical Framework

Historically, the Social cognitive theory (Bandura, 1986), and Transtheoretical model (Prochaska et al., 1994) have been used by Phase II CR providers to understand the patients’ healing process and struggles as they learn new life-preserving behaviors (AACVPR, 2004; Ehrman et al., 2003). It is acknowledged by these theorists that successful lifestyle changes are complex interactions that do not change spontaneously. Behaviors, knowledge, and attitudes are dependent on cognitive, emotional, and intellectual abilities and skills, self-efficacy, motivation, the environment, and other factors (Prochaska et al., 1994). These theories discuss outcomes including adherence, but have not specially targeted the nurse caring relationship.
The Quality-Caring model© combines Donabedian’s (1992) structure, process, and outcome concepts with Mayeroff’s (1971) caring, Watson’s (1979) Theory of human caring, and King’s (1971) Theory of goal attainment to develop a mid-range nursing framework to link nurse caring and outcomes for the patient, nurse, and the healthcare organization (Duffy, 2009). The concept of structure in the Quality-Caring model© includes the patient and family, nurse, and the healthcare organization’s casual past. Each has its own unique phenomenal field, and descriptors. The nurse, patient, and family members each have their own life experiences as well as attitudes and behaviors. In addition, the patient’s description continues with severity of illness and comorbidities. The healthcare organization description includes the staff mix, workload, organizational culture, and resources (Duffy & Hoskins, 2003).

Duffy’s (1990) major purposes for developing the Quality-Caring model © were “to: 1) guide professional practice; 2) reaffirm and expose the hidden work of nursing; 3) describe the conceptual-theoretical-empirical linkages between quality of care and human caring; and 4) propose a research agenda that would provide evidence of the value of nursing” (Duffy & Hoskins, 2003, p. 77). Duffy (1990) defined nurse caring as the behaviors used by the nurse to establish and maintain a cooperative professional relationship established by the professional registered nurse with the patient so the patient could achieve their desired goals. A nurse’s knowledge, skills, availability, and experience are anticipated to assist the patient in achieving the patient’s goals, often called outcomes.

A major component of the Quality-Caring model© is the process of caring that comprises the daily work of the nurse who through the healthcare organization is in relationship with the patient and family, and contributes to the measurable outcomes of the patient, the healthcare
organization, and the nurse (Duffy, 2002; Duffy & Hoskins, 2003). The processes of caring is built on Watson’s ten clinical caritas processes. The ten clinical processes inform and direct the activities of the nurse who is working with the existential nature of the patient (Nyman & Lutzen, 1999). Watson (1988) wrote that the professional registered nurse (RN) needs to be competent in technical nursing skills as the nurse uses the noninvasive, nonintrusive, natural, and energizing ten clinical caritas processes to protect, enhance, and preserve the human dignity of the patient. Competent technical skills are essential for the RN to run the cardiac monitors and exercise equipment in the Phase II cardiac rehabilitation (CR) program. Yet, it is essential for the RN to realize that the potentially unlimited nurse caring relationship between the nurse and patient is vital so information can be communicated and individualized Phase II CR goals met. Moreover, the Quality-Caring model © projects that nurse caring relationships contribute to positive outcomes for the patient, nurse, and healthcare organization (Duffy & Hoskins, 2003).

Duffy and Hoskins’ (2003) Quality-Caring model © places the independent responsibility of initiating, cultivating, and sustaining the caring relationship with the professional nurse. For example, the nurse assumes the role of caring leader during the initial interview with the patient. The RN then continues to develop the relationship within each educational and exercise session. The nurse uses the ten clinical caritas processes to cultivate and sustain the relationship so that the patient continues to progress towards their individualized goals congruent with the Phase II CR program guidelines. The intent is to have the patient feel “cared for” which makes it easier for the patient to change poor habits into healthier habits (Duffy & Hoskins, 2003, p.83).

Likewise, nurses have “a responsibility to co-create collaborative caring relationships with the multi-disciplinary healthcare team in order to foster effective caregiving” (Duffy, 2005, p. 5).
Figure 1 is an adapted version of the *Quality-Caring model*© developed specifically for this study. Located under the first column called “Structure” is added a description of the nurse provider (nurse caring) and Phase II cardiac rehabilitation (CR) patients (demographic, diagnosis, and number of comorbidities). In the second column called “Process,” the Phase II CR nurse and patient are identified as the participants, where the discipline-specific independent relationship between nurse and patient occurs. The last adaptation of Duffy and Hoskins model occurs in the third column called “Outcomes.” The research variables (depression, anxiety, and adherence) are considered outcomes from the caring relationship between the patient and nurse.
Figure 1

The Quality-Caring model©.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Process</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Causal Past)</td>
<td>Caring Relationships</td>
<td>(Future)</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Provider</strong></td>
<td></td>
<td><strong>Terminal Outcomes</strong></td>
</tr>
<tr>
<td>Phenomenal Field</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descriptors (Nurse caring)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unique Life Experiences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitudes and Behaviors</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Patient/Family</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenomenal Field</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descriptors (age, gender)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unique Life Experiences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity of Illness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comorbidities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>System</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenomenal Field</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descriptors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff mix/Workload</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational Culture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Independent Relationships</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient/family-CR Nurse</td>
<td>Discipline-specific</td>
<td></td>
</tr>
<tr>
<td>+ (a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Collaborative Relationships</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Care Team-CR Nurse</td>
<td>Multidisciplinary</td>
<td></td>
</tr>
<tr>
<td><strong>Professional Encounters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intermediate Outcomes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feel “cared-for”</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


a. “+” means that both independent and collaborative relationships comprise the concept, relationship professional encounters. Independent is specific to the discipline of nursing, collaborative includes activities and responsibilities that nurses share with other members of the healthcare team.

b. All caring questions will be asked about the registered nurse (Caring Assessment Tool used).

c. Variables to be studied (CES-D, STAI-Y-1 and a mathematical calculation for adherence tools to be used).
The Specific Problem

Development of a cardiovascular disease (CVD) is a significant source of distress for individuals (Condon & McCarthy, 2006) and has major implications in terms of health (Rosamond et al., 2008), and the individual’s adaptation to their chronic condition (Denollet & Brutsaert, 1998). A substantial amount of scientific evidence is available, which links lifestyle changes to the modifiable cardiac risk factors that reduce hyperlipidemia and inflammation associated with progressive atherosclerosis in CVD (Pearson et al., 2003; Snow, LaLonde, Hindman, Falko, & Caulin-Glaser, 2005). Management of cardiac risk factors in patients with established CVD is supported by research findings that show improvement in both physical (Jollitte et al., 2006; Rejeski et al., 2002) and psychosocial conditions (Beckie, Fletcher, Beckstead, Schoken, & Evans, 2008), the ability to return to work (Pravikoff, 1997), and the patient’s enjoyment of their leisure time (Schairer, Keteyian, Ehrman, Brawner, & Berkebile, 2003). Documentation in the literature indicates that changing lifestyle behaviors is very difficult and a challenge for patients (Prochaska et al., 1994) since each individual patient has different experiences, needs, and expectations (Duffy & Hoskins, 2003; Schweitzer, Head, & Dwyer, 2007).

There is some evidence that individuals who participate in a single cardiac rehabilitation (CR) session have less anxiety and depression (Gavin et al., 2000), and with continued adherence are more successful in making lifestyle changes than those who do not attend (Glazer, Emery, Frid, & Banyasz, 2002). Yet, Oldridge (1995) meta-analysis indicated that on average 33% of referred individuals to a Phase II CR program, did not adhere to the full program.
A few studies indicate that “a successful outcome is dependent on the partnership between the patient and the healthcare provider” (Bray, Brawley, & Millen, 2006, p. 226). In fact, in cardiac patients, a moderately strong positive relationship was found between the Patient Satisfaction Survey (Hinshaw & Atwood, 1981) and perceived quality of nurse caring as scored on the Caring Behaviors Inventory ($r=0.53$, $p=0.01$) (Wolf et al., 2003). McClelland (1997) documented that nurse caring could vary between acute settings and chronic healthcare environments. However, the relationship of nurse caring associated with depression, anxiety, and adherence in rehabilitation outpatients with cardiovascular disease has received limited investigation.

**Statement of the Problem**

The relationship of the perception of nurse caring with depression, anxiety, and adherence in Phase II cardiac rehabilitation (CR) patients has received limited investigation.

**Statement of the Purpose**

The purpose of this study is to determine if a relationship exists between the perception of nurse caring and depression, anxiety, and adherence in Phase II CR patients. The research questions and definition of terms follow.

**Research Questions**

Q1: What is the relationship between the perception of nurse caring and depression in Phase II CR patients?

Q2: What is the relationship between the perception of nurse caring and anxiety in Phase II CR patients?
Q3: What is the relationship between the perception of nursing caring and adherence in Phase II cardiac rehabilitation (CR) patients?

**Definitions of Terms**

**Depression**

**Theoretical definition.** Depression includes a description of the individual as having a downcast demeanor, slowed body language, or a blank facial expression; a soft voice with little inflection, or muteness; irritability or agitation that may present as pacing, hand-wrining, or rubbing their skin. A patient may describe a sense of hopelessness, sadness, discouragement, worthlessness, guilt, anger, body aches, thoughts of death, an inability to make decisions or concentrate, a loss of interest in activities, or having to exert a large amount of effort to achieve a goal (APA, 2000).

**Operational definition.** Depression is the score on the Center for Epidemiological Studies-Depression Scale© (CES-D) (Radloff, 1977). This instrument was chosen since it is a self-report instrument that has proven to be valid and reliable to screen for depressive symptoms in patients with CVD to assist general health care providers in determining if a referral to a medical or mental health specialist would be beneficial for the patient (Barefoot et al., 2000; Van der Kooy et al., 2007). See Appendix A to view the questionnaire.

**Anxiety**

**Theoretical definition.** Anxiety is the apprehension, tension, nervousness, fear, and worry that are in response to the patient’s perception of a physical danger, psychological stress, an uncertain outcome, or the lack of competence to counteract a threat. Individuals may experience sweating, headache, shaking limbs, elevated blood pressure, skin rashes, elevated
heart rates, peptic ulcers, stuttering, and other bodily reactions which contribute to the individual’s self-doubts (APA, 2000).

**Operational definition.** Anxiety is the scores on the State subscale of the State-Trait Anxiety Inventory (STAI) (Spielberger, 1983). This instrument was chosen since it is a self-report instrument that has proven to be valid and reliable with cardiac patients. Of the available 200 instruments that test for anxiety, STAI is the most often used instrument. Clinicians and researchers from nursing, medicine, dentistry, psychology, and other social sciences have used the STAI (Borkovec, Gastonguay, & Newman, 1997). See a copy of the questionnaire in Appendix B.

**Cardiac Rehabilitation**

**Theoretical definition.** Phase II Cardiac Rehabilitation (CR) Program is a comprehensive outpatient program that lasts for 12 to 36 sessions. A patient has an individualized program developed for them that include exercises for strength, flexibility, and endurance as well as individualized educational topics that aim at modifying cardiac risk factors (AACVPR, 2004).

**Operational definition.** Phase II CR program is a single Phase II CR site where outpatients with cardiovascular disease will be studied in this research.

**Adherence**

**Theoretical definition.** Adherence is the extent to which a person’s behavior corresponds with a course of treatment for an identified length of time, as recommended by the healthcare provider and agreed upon by the patient to achieve an effective outcome (Moorhead, Johnson, & Maas, 2003).
Operational definition. Adherence for this study is a mathematical calculation using the actual number of sessions the patient attended the Phase II cardiac rehabilitation (CR) divided by the pre-authorized number of third-party reimbursed sessions, multiplied by 100, and expressed as a percent.

\[
\frac{\text{Sessions Attended}}{\text{Sessions Authorized}} \times 100 = \text{Percent of adherence}
\]

The data will be recorded on the Phase II CR Participant’s Data Sheet (see Appendix C).

Nurse Caring

Theoretical definition. Nurse caring is the interpersonal interactions that are in the independent relationship between the patient and/or family members and nurse that includes mutual respect, faith, hope, trust, and sensitivity. The autonomous activities by the nurse creates a bond between the nurse and patient that assists, supports, and enables a patient to improve their human condition and progress towards their health related goals (Duffy & Hoskins, 2003; Leininger, 1988a).

Operational definition. Patient perception of nurse caring is the scores on the Caring Assessment Tool© Version IV (Duffy, Hoskins, & Seifert, 2007). See Appendix D for a copy of the questionnaire.

Hypotheses

The following hypotheses guide this study.

Research Hypotheses

H1: The perception of nurse caring will have an inverse relationship on depression in Phase II CR patients.
H₂: The perception of nurse caring will have an inverse relationship on anxiety in Phase II cardiac rehabilitation (CR) patients.

H₃: The perception of nurse caring will have a direct relationship on adherence in Phase II CR patients.

**Statistical Hypotheses**

H₀₁: There will be no relationship between the perception of nurse caring and depression in Phase II CR patients.

H₀₂: There will be no relationship between the perception of nurse caring and anxiety in Phase II CR patients.

H₀₃: There will be no relationship between the perception of nurse caring and adherence in Phase II CR patients.

**Assumptions**

1. Phase II CR patients want to feel “cared for” during their Phase II CR experience.

2. Phase II CR participants will answer the questionnaires honestly.

**Significance of Study**

This study, using validated instruments, seeks to find if a statistically significant association exists between the perception of nurse caring and patient’s depression, anxiety, and adherence as a first step to bridging the nurse caring research gap. If the perception of nurse caring is a significant finding for patient’s depression, anxiety, and adherence then nursing interventions could be developed in the Phase II CR program based on theory.

One such nursing intervention would be to use the Quality-Caring model© and diagram how the relationship exists between nurse caring and depression, anxiety, and adherence in the
Phase II cardiac rehabilitation (CR) patient. Based on the data, specific nurse caring interventions can be shared among staff to promote better adherence to the topics that are taught in the educational sessions. Discussions with the Phase II CR staff would also include topics such as using a friendly conversational tone when educating patients on topics including how to deal with sleep disturbance, and effective communication techniques to talk with their medical provider and family members. These nurse caring interventions would require listening to the patient and allowing time for the patient to tell their story. As well as supporting the patient’s beliefs and hopes of the patient’s capability to heal (Duffy et al., 2007). If nurse caring is found significant in this study, the results may be used to substantiate the need for a professional registered nurse with nurse caring skills to be present during the Phase II CR program to assist patients in achieving their individualized outcomes.

**Limitations of the Study**

The generalized results from this study will be limited to the setting studied or similar settings and participants with caution. In addition, the participants may not be able to complete each tool.

**Summary**

This introductory chapter highlighted the problem and discussed nurse caring and patients’ depression, anxiety, and adherence in the Phase II CR program. The purpose of the study has been stated, and supported by a brief general discussion of its potential significance. In addition, a description of the theoretical framework, identification of the research questions, and definitions of terms are included, along with hypotheses, assumptions, and limitations.
Chapter Two

Review of the Literature

The purpose of this study is to determine if there is a significant relationship between the perception of nurse caring and the patient’s depression, anxiety, and adherence in the outpatient cardiac rehabilitation (CR) program. Duffy’s (1990) Quality-Caring model (QCM) is the organizing framework for this study because its purpose is to identify nurse caring factors influencing the nurse-patient relationship. Relevant literature focuses on cardiovascular disease (CVD), emotions of the heart such as depression and anxiety, adherence and nurse caring in the outpatient population. Each of the sections provides a definition and research studies. This chapter will conclude with how this study will add to the scientific knowledge base for nursing educators, theorist, as well as clinical healthcare providers, specifically the professional nurse in outpatient CR programs.

Cardiovascular Disease

Definition. Cardiovascular disease is a broad term used by the World Health Organization (WHO) with nine categories: a) coronary artery disease (CAD); b) stroke; c) heart valves damage from rheumatic fever; d) congenital heart disease; e) peripheral arterial disease; f) deep venous thrombosis and pulmonary embolism; g) aortic aneurysm and dissection; h) tumors of the heart and vascular tumors of the brain; i) cardiomyopathy; and disorders of the lining of the heart (WHO, 2008). In this proposal, the volunteers are participants in an outpatient cardiac rehabilitation program who have experienced a myocardial infarction (MI), coronary artery disease (CAD), coronary artery bypass graft (CABG), cardiomyopathy, angina, cardiac
pacemaker, internal cardiac defibrillators (ICD), stable angina, atrial fibrillation with or without ablation, stents, percutaneous transluminal coronary artery (PTCA), heart transplant, or cardiac valve replacement (American Association of Cardiovascular and Pulmonary Rehabilitation [AACVPR], 2004).

**Theories of CVD development.** The following section reviews the theories that current scientists propose that promote the growth of atherosclerosis, a common finding in cardiovascular disease (CVD). Scientists have found atherosclerotic plaque arises in, not on, vessel walls (Libby, 2002). Other scientists such as Robertson, Park, and Alexander (2006) suggest the formation of atherosclerotic plaque is a complex multifactorial process where the final stage of the process is a MI. Plaque formation is suspected of being precipitated by a response to inflammation, infection, vascular injury and thrombogenesis, heart rate variability, genetic predisposition, and/or polyunsaturated fatty acid that alters the atherosclerotic plaque built in the endothelium (Robertson, Park, & Alexander, 2006).

**Inflammation.** Ross (1999) described the pathology of atherosclerosis as an inflammatory disease. Scientists believe that when low density lipoprotein (LDL) cholesterol is at a reasonable level, the molecules pass in and out of the intima through a matrix-type artery wall, made up of connective tissues and a small amount of muscle cells. When LDL is in excess, it tends to stick in the matrix. As the LDL accumulates, it undergoes oxidation, similar to rusting of a pipe. Other cells in the vessel wall sense this is abnormal and chemically call for the body’s defense system to send monocytes, macrophages, and T-lymphocytes to rid the artery walls of the LDL. When the monocytes attach to the artery walls, the interaction with the LDL causes a reaction to occur that secretes chemokine. This stimulates a response from the macrophages to scavenge for the LDL. As the macrophage becomes fat-filled, they take on the appearance of
foam. In addition, T-lymphocytes, from a different part of the immune system, follow the chemokines into the intima. Together with the foam cells, T-lymphocytes compose a fatty streak, a precursor of plaque. As this process continues between the LDL, macrophages, endothelial cells, and muscle cells, the inflamed intima coalesce into a fibrous cap and a necrotic core that further contributes to inflammation (Libby, 2002; Pollock & Schmidt, 1995; Ross, 1999).

**Infection.** Espinola-Klein et al. (2002) found the extent of infection from pathogens such as herpes simplex virus 1 and 2, cytomegalovirus, Epstein-Barr virus, *Hemophilus influenzae*, *Chlamydia pneumoniae*, *Mycoplasma pneumoniae*, or *Helicobacter pylori* were associated with the development and degree of atherosclerosis. The researchers performed a coronary angiography on 527 German patients with cardiovascular disease (CVD), and again at a mean of 3.2 years. The risk for atherosclerosis and death was associated with an increase in the number of infectious pathogens. CVD mortality rate was 7% for patients with advanced atherosclerosis when 0 to 3 pathogens were found in the plaque, compared to 20% in patients who were positive for 6 to 8 pathogens (Espinola-Klein et al., 2002). In another study, Pussinen, Alftan, Tuomilehto, Asikainen, and Jousilahti (2004) investigated serum antibodies in major periodontal pathogens in men (n= 126) who were free of CVD at the start of the study. The researchers found that as the level of *Porphyromonas gingivalis* IgA-class antibody level increased, the risk for MI increased by four times (3.99, 95% CI, 1.22-13.10). Although no causal role has been determined in laboratory data, scientists suspect these infectious agents contribute to cellular and molecular changes in the arterial walls that promote inflammation and an atherosclerotic risk (McConnell & Klinger, 2006).
**Vascular injury and thrombogenesis.** Ross (1993) hypothesized that vascular injury occurred in certain areas of the endothelium that are prone to plaque build-up and shear stresses due to turbulent blood flow. The most common area for shear is where the arteries branch and become smaller. As the plaque builds up, blood pools, and contributes to further atherosclerotic plaque formation. In an effort to combat the endothelium changes, the body produces cytokines that change the environment inside the body, but also increase the blood pressure and heart rate (Ross, 1993). Ridker (1999) reported on the controversy existing within the scientific community on Ross’s theory and others. Some scientists suggest that fibrinogen is a major player in the inflammation response and not a separate vascular event. Other pathologists suggest that T-cells spur foam cells to manufacture a blood clot inducer that combines with the naturally occurring blood clot precursors to form a clot. Then the body continues the healing process by reabsorbing the clot and forming scar tissue. This happens repeatedly as triggers cause clots to emerge and dissolve, but leave scars that occlude the blood vessel (Ridker, 1999).

**Heart rate variability.** A regular heart rate is perceived to be a sign of a healthy heart. In reality, a healthy person’s heart rate varies with activity. Excessive sympathetic stimulation, diminished vagal stimulation, or both are associated with higher rates of morbidity and death in patients with cardiovascular disease (Curtis & O’Keefe, 2002). Lack of variability in the heart rate reflects a sympathetic-vagal imbalance and is a risk factor for ventricular arrhythmias and sudden cardiac death (Chizner, 2007). Lucini et al. (2002) studied 40 patients after experiencing a major ischemic heart condition where 29 participated in a comprehensive outpatient (Phase II) Cardiac Rehabilitation (CR) program. As these patients exercised, rested, then returned to exercising, the variance of the heart rate and blood pressure became consistent with the changes...
in activity. Researchers speculated the variation in the exercise routine improved heart rate variability and reduced morbidity and mortality for Phase II CR patients (Lucini et al., 2002).

**Genetic predisposition.** Family history has traditionally been recognized as one of the primary unalterable risk factors for premature development of atherosclerosis (McConnell & Klinger, 2006). Genome-wide linkage studies have resulted in the identification of several pairs of alleles, proteins, and genes that are associated with autosomal dominant forms of atherosclerosis that predispose an individual to cardiovascular disease (CVD) (Arnett et al., 2007; Blanco-Colio et al., 2006; Wang et al., 2003). Genes have been identified that alter coagulation factors and fibrinogen responses that increase thrombosis (Moura et al., 2008) and inflammation (Krupinski, Font, Luque, Turu, and Slevin, 2008). In addition, multiple genetic alterations of the renin-angiotensin pathway are associated with hypertension, familial hypercholesterolemia, and CVD (van der Net et al, 2008; Zakrzewski-Jakubiak, 2008). Other genes alter the inflammatory response, regulation of tone on the arterial wall, obesity, and indirect effects on CVD such as development of smooth muscle cell, platelet, vascularization of the arterial walls and plaque, (Lamon & Hajjar, 2008) and vascular endothelial growth factors (Testa, Pannitteri, Condorelli, 2008). Recently, the serotonin transporter gene (5-HTTLPR) has been found to exist in two forms, a short allele, and a long allele. The long allele appears to be associated with a higher risk of developing a myocardial infarction (Fumeron et al., 2002; Otte et al., 2007).

**Polyunsaturated fatty acids.** Most polyunsaturated fatty acids (PUFA) are either unsaturated bonds at the third (omega-3) or sixth (omega-6) carbon from the methyl end of the fatty acid. Certain fishes, grains, and nuts are high in omega-3, whereas vegetable oils tend to be higher in omega-6 PUFA (Skala, Freedland, & Carney, 2006). Hjerkinn et al. (2005), Pischon et
al. (2003), and Ros et al. (2004) found when omega-3 PUFA were present, circulating markers of inflammatory processes and endothelial dysfunction decreased. Epidemiologic studies have found an inverse relation between intake of fish high in omega-3 PUFA and cardiovascular mortality, especially sudden death (Kris-Etherton et al., 2002). Another study found low plasma levels of ethyl-eicosapentaenoate (EPA), a form of omega-3 found in fatty fish, was associated with the low consumption of fish and an increase the risk of cardiovascular mortality (Albert et al., 2002). EPA has also been associated with lowering triglycerides, inhibiting platelet aggregation, and inhibiting cardiac arrhythmia (Peet & Horrobin, 2002).

**Emerging factors.** Researchers added a new category of cardiac risk factors called emerging risk factors since the hallmark Framingham risk scores poorly predicted cardiovascular disease (CVD) risk in young healthy individuals with a family history of premature heart disease (Sailam et al., 2008). Four laboratory serum tests measure the emerging risk factors, which are thought to be modifiable and might better allow identification of patients headed for CVD: C-reactive protein, lipoprotein (a), fibrinogen, and homocysteine (Ajani, Ford, & McGuire, 2006; Wahrenberger, 2003). Emerging cardiac risk factors originated as a result of epigenetic research, which suggests that the environment surrounding a gene can change the gene’s ability to replicate, therefore delaying, or promoting disease and aging (Pray, 2004). Sing, Stengård, and Kardia (2003) suggests that heart disease is the consequence of complex multifactorial interacting agents in the architecture of multiple genes that are exposed to environmental factors. Ornish et al. (2005) found that intensive lifestyle changes, similar to those used in Phase II cardiac rehabilitation, were associated with reversal of early prostate cancer. Currently, the National Institutes of Health is supporting a clinical trial that will measure differences in intensive lifestyle interventions and CVD biomarkers such as C-reactive protein, homocysteine,
B-type natriuretic peptide, multiple types of LDL, fasting insulin, and waist-to-hip ratio, folate, carotenoids, *trans* fatty acids, as well as measures for social support and cognitive functioning (Ornish et al., 2009).

**Modifiable Risk Factors for Phase II CR Patients.** The National Center for Health Statistics (1999) and the Framingham Heart Study (2006) identified both modifiable and non-modifiable cardiac risk factors. The traditional list of modifiable risk factors related to heart disease included hypertension, hyperlipidemia, and cigarette smoking (Dawber, 1980). The current modifiable cardiac risk factors include: a) cigarette smoking, b) dyslipidemia, c) hypertension, d) uncontrolled diabetes mellitus, e) abnormal dietary patterns (that contribute to hypercholesterolemia, obesity, and metabolic syndrome), f) sedentary lifestyle, and g) untreated psychosocial factors such as depression, and stress (Yusuf et al., 2004).

AACVPR recommends lifestyle screenings for every patient on entry to the Phase II CR program (Balady et al., 2007). This includes psychological screening for maladjustment to heart disease, specifically depression. Additional screening include nutritional intake with an emphases on reducing lipids and glucose, cigarette smoking cessation, medication management, heart rate and hypertension management, individualized schedule for physical activity, stress management, and if needed, a referral to other professionals (Thomas et al., 2007). When possible, family members and significant others are included in the Phase II CR educational sessions (Balady et al., 2007).

**Emotions and Cardiovascular Disease (CVD)**

**Emotions and Heart Disease.** Although at first glance emotions and CVD do not seem related, research suggests that emotions and heart disease have an intricate association and perhaps a causal relationship (Pozuelo et al., 2009). In general, scientists report medical illness
can predispose a patient to develop depression and anxiety. Specifically, compared with healthy people, cardiac patients appear to be at greater risk of developing depression and anxiety for many years after the initial medical diagnosis is made (Katon, Lin, & Kroenke, 2007).

In addition, depression and anxiety have each been identified as important risk factors for adverse cardiac events such as coronary artery disease (CAD), myocardial infarction, angina, heart failure, and cardiac mortality. Katon et al. (2007) reviewed 31 studies involving 16,922 patients. After the severity of the medical condition was controlled, patients with depression and anxiety reported the highest number of medical symptoms.

**Pathophysiological Theories Linking Emotions and Cardiovascular Disease (CVD).**

Scientists believe that physiology can explain the connection between strong emotions and CVD. Kubzansky and Kawachi’s (2000) meta-analysis suggests that intensive emotions (depression, anxiety) are directly linked to CVD as contributing factors because the emotions change chemicals (cortisol, catecholamines) that activate the hypothalamic-pituitary-adrenocortical axis and sympathetic-adrenal-medullary system. As chemicals such as epinephrine and norepinephrine increase, free fatty acids, blood pressure, heart rate, platelet aggregation, coronary vasospasm, and peripheral resistance increase, which increase the heart’s workload, could lead to plaque rupture and a MI (Kubzansky & Kawachi, 2000). Other pathways associated with depression and CVD morbidity and mortality are genetic predisposition, decreased heart rate variability, vascular injury and thrombosis, inflammation, polyunsaturated fatty acids, and unhealthy lifestyle choices, which are discussed in the next few paragraphs.

**Genetic predisposition.** Genetic scientists are focused on the serotonin transporter gene polymorphism (5-HTTLPR) for depression as well as CVD. Otte, McCaffery, Ali, and Whooley
(2007), using Heart and Soul study data (n=383), found that patients with a short allele had a higher likelihood of depression (25%, 97 of 383).

**Heart rate variability.** Carney et al. (2001) reported that patients with CAD and depression (n= 365) had significantly less heart rate variability (HRV) compared to non-depressed cardiac patients (n=411), which increased mortality after a myocardial infarction (MI) by a two-fold increase. However, Gehi, Mangano, Pipkin, Browner, and Whooley (2005) looked at 873 outpatients with stable coronary artery disease (CAD); 195 (22%) had major depression. The researchers found no association between CAD and heart rate variability. The scientists reported that all their patients with stable CAD, with or without depression, had low heart rate variability (p>0.10).

**Vascular injury and thrombogenesis.** Musselman et al.’s (1996) study reported an increase in markers of platelet activation for 12 depressed patients with heart disease compared to eight non-depressed patients. In the subset of patients treated for their depression with sertraline (Zoloft), platelets and endothelial biomarkers decreased.

**Inflammation.** Similar to cardiovascular disease, inflammation is thought to play a key role in depression. Miller, Stetler, Carney, Freedland, and Banks (2002) found higher levels of inflammatory markers (C-reactive protein (3.5+0.5 vs 2.5+ 5mg/l, p=0.04), and interleukin-6 (3.0 + 0.3 vs 1.9 + 0.2 pg/ml, p=0.007) in cardiac patients with depressive mood characteristics (n=50) compared with control subjects (n=50). A prospective study by Frasure-Smith et al. (2007) reported a direct correlation between depression scores and C-reactive protein levels in post-MI patients (n=102, 78 males). C-reactive protein levels were associated with increased cardiac death, MI, cardiac arrests, or non-elective coronary artery bypass surgery over a two year
period (hazard ratio (HR) for C-reactive protein > 2.0mg/L = 1.67, 95% CI = 1.07-2.62, p=0.025) (Miller et al., 2002).

**Polyunsaturated fatty acids.** Epidemiologic studies have found a strong, inverse relationship between omega-3 PUFA in the diet and depression, where omega-3 intake may improve depressed moods and prevent relapse (Nemets, Stahl, & Belmaker, 2002; Peet & Horrobin, 2002). Frasure-Smith, Lesperance, and Julien (2004) compared 54 patients with cardiovascular disease (CVD) and depression to individuals with CVD without depression. The patients with CVD and depression had lower plasma concentrations of total omega-3 as well as a greater imbalance between omega-3 and omega-6 compared to patients without depression.

**Emerging factors.** Rozanski, Blumenthal, Davidson, Saab, and Kubzansky (2005) suggested that scientific evidence supports the need for a “behavioral cardiology, which is based on the understanding that psychosocial and behavioral risk factors for CVD are not only highly interrelated, but also require a sophisticated healthcare delivery system to optimize their effectiveness” (p. 637). These same researchers report that traditional physicians focus mainly on managing lifestyle behaviors such as overeating and physical inactivity, and traditional psychiatrists focus on medications for depression, or anxiety. The researchers recommend a well-trained psychologist, who understands both the patient’s physical and psychological needs, to work with patients with CVD to achieve better patient outcomes (Rozanski, Blumenthal, Davidson, Saab, & Kubzansky, 2005).

**Behavioral Theories Linking Emotions and CVD.** Some researchers report that emotions indirectly influence CVD. Aldwin, Spiro, Levenson, and Cupertino (2001) analyzed The Normative Aging Study data, collected over an 18.55-year span. The behaviors of the 1,515 males (with anxiety and depressive disorders) included smoking, excess consumption of alcohol,
lack of physical activity, obesity, and low social resources, which are cardiac risk factors (Aldwin et al., 2001).

Denollet and Brutsaert (2001) followed nonrandomized men (n=150) with CAD for nine years that had similar left ventricular ejection fractions (LVEF), MI status, thrombolytic therapy, and medical-surgical treatments during the trial. Standardized medical care was provided for 72 patients, while 78 patients participated in a Phase II cardiac rehabilitation (CR) program. The investigators followed survivors who had attended the Phase II CR program, at three months and during the ninth year, to check on reduced distress and mortality. At the end of three months, 42 of 78 patients in rehabilitation (54%), and 22 out of 72 patients receiving standard care (30.5%) reported improvement with decreased distress scores (p=0.004). Four patients in the Phase II CR program also reported lessening in their negative affect (5%), while 18 out of 72 (25%) standard medical care patients reported worsening of their distress as measured by the Global Mood Scale (GMS) (p=0.001). The GMS included ten negative mood (e.g. listless, wearied) and ten positive mood (e.g. cheerful, lively) terms, and were rated on a 5-point scale. The three month evaluation mean score was 9.1 (SD 7.7, range 0-32) for negative affect and 18 (SD 7.7, range 0-39) for positive affect (n=150). At the long-term follow-up, 15 of the 150 patients (10%) had died of which 14 were cardiac related; two deaths were from Phase II CR group, and 12 deaths from the standard treatment group. Multivariate analysis yielded two independent predictors for 9-year mortality: a) LVEF of less than 50% increased mortality risk (Odds Ratio (OR) = 3.2, 95% CI, 1.1-9.8, p=0.041) and b) participating in Phase II CR decreased morality risk (OR=0.2, 95% CI, 0.1-0.7, p=0.016). The rate of death for high risk patients, with a LVEF of ≤ 50%, without Phase II CR was 2.3 times greater than that of myocardial infarction patients in the Phase II CR program (OR=2.3, 95% CI 1.3-4.0, p=0.003) (Denollet & Brutsaert, 2001).
Historically, exercise has been recommended for patients with cardiovascular disease and emotional distress. Dearman and Frances (1983) and Pierce, Eastman, Tripathi, Olson, and Dewey (1993) suggested endorphins were produced with exercise, which provided exercise participants with a relaxed psychological state during and after 45-minutes of vigorous exercise. Today, researchers are finding mixed results in their studies. In 2008, Egger, Schmid, Schmid, Saner, and von Kanel investigated (n= 114) depression, and anxiety before and after Phase II cardiac rehabilitation (CR). Using the Hospital Anxiety and Depression Scale (HADS) the researchers found that depression and anxiety scores decreased indicating improvement as the program progressed. The HADS depression showed pre-treatment scores of 4.0 ± 3.6 compared to post-treatment scores of 2.7± 2.7 (p<0.001). The HADS anxiety scores indicated pre-treatment scores of 5.4 ± 4.4 that changed to post-treatment scores of 4.1 ±3.6 (p<0.001). After controlling for covariates of sex, age, program duration, and LVEF, depression scores at entry to the program were significantly correlated with improved exercise progression (r (114) = -0.19, p = 0.047); the direction of this relationship suggested higher levels of depression before Phase II CR were still associated with less improvement in exercise capacity. In contrast, anxiety scores at the study beginning correlated with exercise change suggested a marginal relationship in exercise capacity (r (114) = 0.17, p < NS). However, De Moor, Boomsma, Stubbe, Willemsen, and de Geus’ (2008) study involving 5,982 twins, 1,357 additional siblings, and 1,249 parents between the ages of 18 to 50 years did not find the expected change in anxiety and depression with exercise. In the genetically identical twin pairs, the twin who exercised more did not display fewer anxious and depressive symptoms than the co-twin who exercised less (De Moor et al., 2008).
Depression, Phase II Cardiac Rehabilitation, and Cardiovascular Disease (CVD)

Scientists and healthcare providers have determined that depression is a chronic condition that involves both the mind and body (Videbeck, 2008). Rudisch and Nemeroff (2003) suggest that as many as 20% of individuals with CVD have an additional diagnosis of depression. The standard to define depression in an individual with CVD is found in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) (2004). The same descriptive definition is used in this study. A person with depression and cardiovascular disease (CVD) has a downcast demeanor; slowed body language; or a blank facial expression; a soft voice with little inflection, or muteness; irritability or agitation that may present itself as pacing, hand wringing, or rubbing the skin.

A Phase II cardiac rehabilitation (CR) patient who is depressed may describe a sense of hopelessness, sadness, discouragement, worthlessness, guilt, anger, body aches, thoughts of death, an inability to make decisions or concentrate, a loss of interest in activities, or have to exert a large amount of effort to achieve a goal (American Psychological Association [APA], 2000). In addition, Barefoot et al. (2000) further emphasized that patients with both depression and heart disease share a number of physical symptoms, such as loss of energy, inability to perform normal activities, and sleep disturbances, which are manifestations of both CVD and depression.

Nursing researchers, as well as other scientists, have identified that depression does exist in Phase II CR patients. Dunn (2005) described 351 patients (123 females, 228 males) with moderate to severe depression at the beginning of a Phase II CR program. The patient’s depression scores on the Center for Epidemiological Studies - Depression (CES-D) decreased, indicating improvement of depression, over the three-month period while participating in the
Phase II CR. Scores on the CES-D tool range from zero to 30, with higher scores indicating a need for referral to a physician at 16 or greater. The average baseline score found by Dunn was 12.6 (Standard Deviation (SD) = 9.7), while the average at three months decreased to 9.5 (SD=9.5) ($t$ (350) = 7.18, $p< 0.01$). Dunn also found that approximately 32% of participants reported a depression score of 16 or greater at the start of the Phase II CR program, while 23% reported a score of 16 or greater at the end of the 12-week program (Dunn, 2005).

**Morbidity and Mortality in Depression and Cardiovascular Disease (CVD).** Researchers have found that depressive symptoms are found in patients recovering from CVD, and are an independent risk factor for both mortality and morbidity (Van der Kooy et al., 2007). In a landmark study, Frasure-Smith, Lesperance, and Talajic (1995) (n=218), showed that patients who were depressed at one week after an MI were three to four times more likely to die in the next six months compared to non-depressed, post-MI patients. Even after 18 months, depression remained an independent risk factor for cardiac-related deaths (Lesperence, Frasure-Smith, & Talajic, 1996). The research revealed that one in 20 American adults experience a new onset of depressive symptoms every year and the incidence increased to one in three for individuals who survived the first MI (Lesperence et al., 1996).

Ariyo et al. (2000) followed 4,493 subjects for six years in the Cardiovascular Health study. Participants were free of CVD at baseline, then received annual interviews and completed the modified CES-D questionnaire that contained 10 questions with a range of scores from zero to 30. Participants with scores of eight or above were at risk for depression. In multivariate analyses adjustment for age, race, sex, education, diabetes, hypertension, cigarette smoking, total cholesterol, triglyceride level, congestive heart failure, and physical inactivity were used when determining the adjusted hazard ratio (AHR). The researchers found an association with every
five points increase in mean depression score, the AHR increased for: a) the development of heart disease (n = 606, AHR=1.15, p=0.0006); and b) those with angina without an MI (n=298, AHR= 1.20, p=0.009). The researchers also found that among participants with the highest cumulative mean depression scores (≥15), the risk of heart disease increased by 40% and the risk of death by 60%, compared with those who had the lowest mean scores between five and nine (Ariyo et al., 2000).

In a study by Blumenthal et al. (2003), researchers followed 817 Americans with moderate to severe depression through a recovery period of six months post-CABG. The cardiovascular disease (CVD) patients with depression had a higher rate of death compared to CVD patients with no or subclinical levels of depression. Similarly, in an international study conducted by Surtees et al. (2008), found evidence that depression is associated with higher rates of death from CVD in the United Kingdom. The researchers followed a prospective cohort of 8,261 men and 11,388 women (41-80 years of age) who were free of clinical heart disease. Patients who had depression at the initial examination, or in the past 12 months, had a 2.7 times higher risk of dying compared to those who had never had depression or who had had it more than 12 months previously. This increased risk of heart disease was independent of age, sex, smoking, systolic blood pressure, cholesterol, physical activity, body mass index, diabetes, social class, heavy alcohol use, and antidepressant medication use (Surtees et al., 2008).

**Characteristics of Patients with Depression and Cardiovascular Disease (CVD).** The National Institution of Mental Health’s (NIMH) (2003) report revealed that both men and women developed similar depressive symptoms, but verbal descriptions given by patients with depression and CVD are notably different between the genders. Women described their depressive symptoms as feelings of sadness, worthlessness, and guilt. Men were more willing to
report fatigue, irritability, loss of interest in work or hobbies, sleep disturbances, and anger, which at times became abusive in nature. In Wong, Pituch, and Rochlen’s (2006) study, the researchers’ noted that males express their emotions less than females, which contributed to the fact that healthcare providers miss symptoms of depression, especially if other physical problems such as chest discomfort are more prominent. In another study, Blanc et al. (2007) followed 256 women and 637 men and found that women had significantly higher depression scores compared with men at the beginning of a Phase II cardiac rehabilitation (CR) program. However, by the end of the 12-week Phase II CR program, depression scores were similar in both genders.

A few studies have examined age in depressed patients recovering from a cardiac event (myocardial infarction (MI), coronary artery bypass graft (CABG), percutaneous transluminal coronary angioplasty (PTCA), valve replacement, or atrial-septal defect repair) that are candidates for Phase II CR. Plach, Napholz, and Kelber (2003) used three subgroups of women (n=155) divided into groups by age recovering from open-heart surgery for a CABG, valve replacement, or an atrial-septal defect in the previous five months. Women aged 40-55 years composed the early middle-age group (n=24, 17%), women aged 56-65 years composed the midlife age group (n=45, 29%), and women aged 66+ years were considered elderly (n=84, 54%). Affective depression scores (range from zero [none] to 9 [feeling blue]) and the mean for all participants was 1.72 (SD= 2.22). A small significant difference was found by age group (F [2, 152] = 3.05, p=0.05). Older women in the study fared better than the younger women in terms of depression scores. Tukey post hoc comparison scores for the youngest age (M= 2.69, SD=2.51) were significantly higher than scores for the mid-life participants (M=1.49, SD=2.26) and older participants (M=1.55, SD =2.05). Similarly, Beckie, Fletcher, Beckstead, Schocken, and Evans (2008) reported that younger women had almost twice as many depressive symptoms
than older women (64% to 37%) at the beginning of a Phase II cardiac rehabilitation (CR) women’s only program (n=182).

Researchers have noted other common characteristics of patients with depression as they enter Phase II CR. Milani, Lavie, and Cassidy (1996) followed 338 patients after a major cardiac event and through a 36-session Phase II CR program. Twenty percent of the patients were depressed at baseline. The researchers noted that the depressed CVD patients started the Phase II CR with lower exercise capacity, reduced HDL levels, higher triglyceride levels, more fatigue, more pain, higher anxiety, and hostility than patients who were not depressed. Two-thirds of the depressed patients who completed the 36 sessions had symptom resolution by the end of the usual Phase II CR program (Milani, Lavie, & Cassidy, 1996).

In another study, Swardfager et al. (2008) recruited a convenience sample of 366 Phase II CR patients. The researchers found that 22% (n =82) individuals had mild to significant depressive symptoms at the beginning of the study, even though antidepressants prescriptions were ordered for 6.3% of the patients. The authors concluded that depressed patients had reduced physical fitness, heart disease at a young age, female gender, previously used antidepressants, and ischemic chest pain.

Scientists continue to explore methods to decrease depression in patients with CVD. Blumenthal et al. (1999) followed 124 men and women, greater than 50 years of age, with major depression in a Phase II cardiac rehabilitation (CR) program of 16 weeks in length. Patients with a history of bipolar or major depression were randomly assigned to a group receiving medication (sertraline) only (n=41), exercise only (30 minutes three times per week) (n=39), or a combined program of exercise and medication (n=44). The groups were similar at baseline. By the end of 44 sessions, all patients enrolled in the medication, exercise, or combination program were no
longer clinically depressed. Seven subjects, who dropped out and completed a depression-screening tool, remained depressed at the close of the study. Babyak et al (2000) continued to follow the same participants for an additional 6 months. In the extended follow-up, the researchers found that the exercise group without sertraline did better compared to the other two groups. The exercise groups were found to be motivated, highly educated, and physically able to exercise compared to the medication only group.

**Anxiety and Phase II Cardiac Rehabilitation**

Historically, Phase II CR clinicians have screened for depression on entry to the Phase II CR, however, recently healthcare providers have realized that both depression and anxiety may occur at the same time in a person (McCrone, Lenz, Tarzian, & Perkins, 2001). Psychologists and psychiatrists have recently clarified the definition of anxiety and a growing body of statistical knowledge suggests that anxiety alone may be a risk for Phase II CR patients, even after controlling for depression. The following section discusses the delay in cardiac recovery when a person experiences uncontrolled anxiety.

Anxiety as described by the DSM-IV, and used in this study, has both negative emotions (fear, nervousness, and worry) and physiological characteristics (increase in blood pressure, rapid heart rate, sweating, dry mouth, tremors, nausea, vertigo, breathing problems, restlessness, and weakness) (APA, 2000). Spielberger (1983), a renowned psychologist and theorist, further defined the stable personality called trait anxiety (T-anxiety); and labeled the symptoms elicited through provocation as state anxiety (S-anxiety). Videbeck (2008) reports T-anxiety as a response to external or internal stimuli that contributes to behavioral, emotional, cognitive, and physical symptoms classified by the DSM-IV. General anxiety disorder is the most common type of anxiety studied in CVD (Dew et al., 2001).
McCann, Fauerbach, and Thombs (2005), psychiatric educators suggest that anxiety is the norm following a MI or a CABG, and labeled ‘normal illness-related anxiety’ (p. 50). According to these psychiatrists, patients are suddenly confronted with their own mortality and are concerned with their future and the impact of their diagnosis and illness on their occupations, personal lives, and relationships with others. Healthcare providers can take specific actions to assist patients during their recovery. These actions include: a) answering questions about the specific cardiac condition and emotions that the person may be experiencing and correcting any misconception; b) referral to Phase II cardiac rehabilitation; c) writing instructions for medications and tests to be done; d) sharing the same information with family members; e) and if anxiety does not subside, then a referral to a mental healthcare provider (McCann et al., 2005).

Higgins, Murphy, Nicholas, Worcester, and Lindner’s (2007) qualitative survey recorded clinicians’ experiences with cardiac patients reporting their symptoms of anxiety, ranging from normal reactions during an acute illness to anxious symptoms that masqueraded as CVD. According to the therapist, many patients described anxiety as a cycle where the fear of another cardiac event promoted hypervigilance against bodily sensations that led to stress and misinterpretation of the symptoms to be cardiac in origin. Therapists also described the patients addressing their own mortality for the first time, since the MI was interpreted as the beginning of poor health that could result in death (Higgins et al., 2007). Furthermore, patients reported increased anxiety when living too far from the hospital, living alone, or periodically left alone. Some were anxious about returning to work, others were fearful of not returning to work and financial difficulties. Anxious symptoms affected sleep, exercising, resuming sexual activities, which in turn created an environment for further deterioration of the patient’s physical and psychological health. This decrease in function caused the person to question their
responsibilities and role in life. As these anxiety symptoms continued, the healthcare providers noted reduced motivation, with a consequence of poor health outcomes (Higgins et al., 2007).

Coexistence of Anxiety and Cardiovascular Disease. Current research has documented anxiety as an important risk factor for developing cardiac diseases. Härter, Conway, and Merikangas (2003) found that anxiety was associated with coronary artery disease (CAD) and hypertension. The researchers interviewed 262 (108 males and 154 females) from an outpatient anxiety and alcohol treatment center, and a control group of 93 subjects (60 males and 33 females) with no evidence of an anxiety disorder from the general population. Using logical regression and controlling for depression, gender, and substance abuse an individual with anxiety, compared to controls, was at a 4.6-fold risk for cardiac disorders ($\chi^2 (1, 334) = 5.30, p = 0.001$) and a 2.4-fold risk for hypertension ($\chi^2 (1, 334) = 4.47, p = 0.034$). Hypercholesterolemia, a cardiac risk factor, was categorized with diabetes and gout as metabolic disorders. Anxiety and metabolic disorders had a non-significant finding (odds ratio = 1.55 (0.66 to 3.66), $p > 0.05$). Smoking cigarettes, an additional cardiac risk factor, was not evaluated. However, the respiratory diseases associated with smoking such as bronchitis, chronic cough, asthma, and emphysema were evaluated. Individuals with anxiety was found to have a 2.6-fold increased risk with a respiratory disorders presence ($\chi^2 (1, 334) = 7.94, p = 0.004$). These findings promoted the author’s hypothesis that individuals presenting with anxiety need further evaluation for comorbidities (Härter et al., 2003).

A few years later, Shibeshi, Yinong-Xu, and Blatt (2007) followed 516 outpatients with cardiovascular disease for a mean of 3.4 years (mean age 68 years, 82% males). The researchers ranked the patients in high (n=137), intermediate (n=178), and low (n=201) anxiety groups. The researchers found high cumulative anxiety (a score of $\geq 9$ on a scale of 0 to 23) was associated
with an increased risk for both non-fatal MIs (n=44) and death (n=19) (hazard ratio (HR) = 1.97, 95% CI, 1.03- 3.28, p=0.04). Repeated measures of anxiety were found to be better predictors of outcomes verses a single baseline anxiety score. In addition, repeated measures captured the changes in anxiety scores when a person was exposed to high levels of anxiety long-term (adjusted HR= 1.10, 95% CI, 1.04 – 1.16, p<0.001). Alternatively with the assistance of Cox regression, researchers’ supported their observations that individuals who originally had high anxiety and reduced their anxiety scores, had a significant reduction in death and recurrent cardiac problems (multivariate-adjusted HR = 1.10, 95% CI, 1.02 – 1.20, p = 0.02) (Shibeshi et al., 2007).

Characteristics of Patients with Anxiety and Cardiovascular Disease (CVD).

McCrone, Lenz, Tarzian, and Perkins (2001) followed 31 patients (20 men and 11 women, mean age of 70 ± 8.6, 61-81) pre-operatively through 12-weeks of recovery after a coronary artery bypass graft to determine the influence of age on T-anxiety. S-anxiety was highest preoperatively, declined steadily through the fourth postoperative week, and then increased slightly at the 12th week. Independent t-tests revealed a small statistically significant gender difference in trait anxiety ($t (31) = 2.6, p< 0.05$) and state anxiety preoperatively ($t (31) = 2.3, p<0.05$), and at 2 to 3 days ($t (31) = 2.7, p< 0.05$), 2 weeks ($t (31) = 2.3, p< 0.05$), and 8 weeks ($t (31) = 2.2, p< 0.05$) postoperatively, with women scoring higher than men. The researchers reported a large statistically significant Pearson product moment correlations (ranging from $r = 0.413$ to 0.703) between depression and state anxiety at all times. Additionally, T-anxiety was also significantly correlated with S-anxiety across the pre and postoperative recovery periods ($r = 0.586$ to 0.794) (McCrone et al., 2001, p. 160). In another study, Turner, Bethell, Evans, Goddard, and Mullee (2002) evaluated 1,443 patients who had completed a comprehensive
Phase II cardiac rehabilitation program in a community hospital. The investigators found that women showed greater reduction in anxiety scores compared to men ($t=2.65; p=0.008$) (Turner et al., 2002).

Similarly, in Moser et al. (2003) comparative study of 912 international post-myocardial infarction patients from five cultures found that women had higher anxiety scores than men. The researchers used the anxiety subscale of the Brief Symptom Inventory, which contained six items, each scored from zero to four, with higher scores indicating more anxiety. The mean level of anxiety for the entire sample was $0.62 \pm 0.33$. However, 16% of women and eight percent of men reported scores from zero to 3.83, which is higher than values seen for psychiatric patients. For reference purposes, the published norm for non-patient subjects are scores of $0.35 \pm 0.45$, for psychiatric inpatients is $1.5 \pm 1.1$, and for psychiatric outpatients is $1.7 \pm 1.0$ (Derogatis, 1993).

Researchers found anxiety scores were independent of age, education level, marital status, or severity of illness, pain levels, or blood pressure (Moser et al., 2003). In the same year, Strik, Denollet, Lousberg, and Honig (2003) followed 318 men with a mean age of 58 years for 3.5 years after a patient’s first MI. Increased symptoms of anxiety (hazard ratio (HR) = 3.01, 95% CI, 2.1 to 7.6; $p=0.019$) were found to be associated with age, left ventricular ejection fraction, and previous use of antidepressants. Anxiety (odds ratio (OR) = 2.00, 95% CI 2.14 - 3.22; $p = 0.005$) was a predictor for rehospitalization and frequent visits at the cardiac outpatient clinic (Strik et al., 2003).

Lavie and Milani’s (2004) pre-test, post-test study of non-randomized Phase II cardiac rehabilitation patients ($n=500$) revealed a very high prevalence of generalized anxiety and moderate to severe anxiety symptoms in younger patients ($< 55$ years) ($p<0.01$). Lavie and Milani (2004) used the validated tool, Kellner Symptom Questionnaire, for assessing depression
and anxiety, which contained 92 psychiatric and somatic conditions. The patient chose the response (yes, no, true, or false) that best described their feelings during the past week. A score of one was given for each yes or true question. Higher scores indicate more distress (Kellner & Sheffield, 1973). At the beginning of the study, both individuals with and without anxiety, were similar in gender (p< 0.01). Patients with high anxiety on average were four years younger (p<0.01). Other differences included higher: weight, percent of body fat, basic metabolism rate (BMI), triglycerides, and cholesterol. These same patients also had higher scores for depression, hostility, and somatization, and 20% lower quality of life scores. At the end of the 36 sessions Phase II cardiac rehabilitation (CR) program, the prevalence of anxiety (symptom scores > 7) were reduced from 27% to 12 %, and patients with higher anxiety (symptom scores > 10) decreased prevalence from 13% to 4%. The researchers found in participants with symptom scores > 10, who experienced reduced anxiety, a marked improvement with weight loss (3%, p = 0.02), a decrease in the percent of fat (7%, p<0.01), BMI (3%, p= 0.02), improved exercise capacity (44%, <0.0001), and lipids (7%, p < 0.05). These results were similar in both genders (Lavie & Milani, 2004).

Additionally, clinical observations reported by Dugas, Buhr, and Ladouceur (2004) postulated that uncertainty might be an important cognitive process involved in anxiety. The tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events was found to be stressful and upsetting, thereby subjects found it difficult to function in uncertain situations (Dugas et al., 2004). A research study that took this concept further was Godemann et al. (2004). The researchers used the psychiatric subjective tool called Diagnostic Interview of Psychiatric Syndrome and a one-time interview in a retrospective cross-sectional design study to estimate the incidence of anxiety (n=90) on patients eligible for Phase
II cardiac rehabilitation who had received a third generation implanted automatic internal cardiac 
defibrillator (AICD). The researchers assessed the impact of the severity of the patient’s cardiac 
disease, anxiety, depression, the number of discharges from the AICD necessary for the patient’s 
survival from their cardiac disease, and the subjective appraisal of the shock experience on the 
development of anxiety. The researchers found that 68% of patients experienced an AICD shock 
within their first year. Anxiety scores were three times higher after a single defibrillation shock 
from the AICD compared to individuals who had not had an AICD electrical discharge (21% vs 
6.9%, respectively, p<0.05). In addition, anxiety was higher for patients who experienced more 
than two discharges compared to patients receiving one electrical discharge annually (62% vs 
10%, p<0.01). The researchers postulated that the uncertainty of the next AICD discharge, 
required to sustain the patient’s life, elevated the patient’s anxiety (Godemann et al., 2004).

Reduction of Anxiety in Phase II Cardiac Rehabilitation (CR) participants.

Researchers have suggested that education and exercise during Phase II CR reduces anxiety. 
Johnston, Foulkes, Johnston, Pollard, and Gudmundsdóttier (1999) found that anxiety scores 
significantly dropped for male cardiac patients (n= 100) and their partners (n=72) when a nurse 
counseled them on cardiac recovery. The researchers used repeated-measures ANOVA to 
investigate the differences between three educational groups: Inpatient (n=67), Extended (n=48), 
and a control group (n=57). The control group received no education. The inpatient group had 
five educational sessions conducted prior to discharge from the hospital. The extended group 
education had one session inpatient and eight sessions over a six-week period after discharge 
from the hospital, which was conducted in Phase II CR. The inpatient group received an average 
of 3.69 hours (SD=0.19) of education. The extended group received an average of 8.43 hours 
(SD=0.48) of education. The topics included: a) explanation of a heart attack and how healing
takes place, b) rationale for treatment given in hospital, c) risk factors (stress, smoking, cholesterol, sedentary lifestyle, weight, family history, blood pressure, diabetes, and alcohol) and their modification, d) emotional effects after a myocardial infarction, e) the effects of stress and how to manage it, f) resumption of activities in the recovery period, and g) additional treatments and procedures designed to enhance the patient’s control. The researchers used the HADS to assess anxiety. The tool had a range of scores from 0-21, with the higher scores indicating higher levels of anxiety. The scientists found a significant (group by time) interaction for anxiety ($F(7.0, 302.7) = 2.32, p= 0.03$). Both intervention groups had lower anxiety scores than the control group at 2 months (inpatient $p= 0.001$; extended $p= 0.013$) and at 6 months (inpatient $p=0.018$; extended $p=0.013$). In addition, the scientists found a significant group by time interaction for anxiety ($F(5.7, 133.1) = 2.28, p =0.04$). On anxiety, the inpatient group had lower scores than the control group at discharge ($p = 0.016$), and at 2 months ($p=.02$) and the extended group had lower levels than the control group at 2 months ($p < 0.001$), six months ($p= 0.001$) and 12 months ($p = 0.002$). The extended educational group had lower anxiety than the inpatient group at 2 months ($p=0.02$) and 6 months ($p=0.02$) (Johnston et al., 1999).

In another study, Yoshida et al. (1999) followed 29 post-MI patients (27 males and 2 females) who enrolled in a four-week Phase II cardiac rehabilitation (CR) program and a control group of 34 post-MI patients (27 males and 7 females) to assess for physical and psychological improvements. The assessments starting at discharge from the hospital, discharge from Phase II cardiac rehabilitation (CR), and then at 6 months. Seven patients from the Phase II CR group and nine patients from the control group suffered restenosis of the coronary artery during the six-month follow-up period and withdrew from the study. The investigators used the State Trait Anxiety Instrument (STAI) to measure anxiety. The total score ranged from 20 to 80, with lower
scores reflecting a better psychological condition. The researchers found that Phase II CR participants anxiety scores improved significantly from the beginning to the end of the program (Beginning STAI scores: 42.6 ± 9.6 vs 37.4 ± 9.6; t (20) = 2.50, p=0.02, Ending STAI scores: 43.6 ± 11 vs 40.8 ± 10.5; t (20) = 2.24, p=0.04). The control group showed no change in anxiety when comparing the beginning anxiety scores and the six-month follow-up (Yoshida et al., 1999).

**Nurse Caring**

Nursing theorists suggest that nurse caring is not a simple abstract nursing philosophy, or a non-related idea to nursing activities (Eriksson, 2002). Evidence of nurse caring is found in clinical nurses’ notes and research studies documenting the nurse-patient conversations and relationships (Burt, 2007; Leininger, 1991; Wolf, Miller, & Devine, 2003). Theory development for nurse caring is discussed in the next section.

**Theory Development of Caritas and Nurse Caring.** Rogers (1970) and Watson (2005), leading nurse caring theorists, report that nursing science borrowed the concept of caritas from ancient philosophers and world religions to expand the concept to nurse caring beyond the modern day use of the word caring. Watson (1979) saw this expansion of the nurse caring concept as necessary and started by declaring nurse caring was central to nursing, which required the nurse to be present, in body and spirit, with the patient (Sherwood, 1997). Lingis (1969) wrote that since the intentions and thoughts of the nurse cannot be observed, patient’s and onlookers’ judgments are placed on the visible actions that the professional nurse performs, which has helped nursing researchers develop instruments such as the Caring Assessment Tool (CAT-IV) to measure nurse caring (Duffy, Hoskins, & Seifert, 2007).
In historical writings, synonyms for *caritas* are friendship, relationship, charity, and love (Sollier, 1910). The *Oxford English Dictionary* (1989) indicates the early fifth century English Bible translators were monks immersed in Latin. When the monks translated the original Greek word *caritas* into Latin, words such as *agape* or *charite* were used, which were later transformed to “dearness, fondness, affection; love founded upon esteem” (Oxford, 1989). The following section traces the concept of *caritas* through the writings of Aristotle, Aquinas, Pope Benedict XVI, the Christian Bible, the Qur’an, and the Talmud that help create a link to nurse caring.

Aristotle (384 BC), a Greek philosopher, wrote his lecture notes on virtuous activities in *Nicomachean Ethics* (Crisp, 2000). In book one of *Nicomachean Ethics*, friendship is declared a virtuous activity that leads to a life of human happiness and is necessary no matter if the person is young, old, financially rich, or improvised. The virtuous friendship is where the individuals wish good things for each other. This friendship requires time to allow each individual to become familiar with one another and endures as long as the friendship accepts the unqualified goodness and pleasantness as well as worthiness of love by both participants (Crisp, p. 147). Aristotle’s friendship requires equality of power and status as well as shared activities, choices, and feelings that benefits the giver and receiver of the virtuous activity. Without this relationship, Aristotle proclaims there is a loss of enthusiasm for virtuous living and the relationship (Schwartz, 2007).

Saint Thomas Aquinas (1227 AC), an Italian theologian and philosopher, significantly influenced Western philosophy and the Catholic Church. Aquinas believed that truth was available to all people through natural and supernatural revelation. Natural revelation is found in human nature and human reason. Supernatural revelation such as faith originates from inspiration of the Holy Spirit and teachings from the Holy Scriptures (Baird & Kaufmann, 2007).
Aquinas devoted his discussions of friendship to charity, one of the three supernatural or theological virtues. For Aquinas, friendship is the ideal relationship between rational human beings when it is based on Christ’s human nature in a relationship with God (Kreeft, 1990). Thomas Aquinas emphasizes that human beings benefit from sharing deliberate congenial relationships when sharing communications, humor, food, goals, and affection. These activities provide solace from a harsh world and promote moral, intellectual, and spiritual growth based on the virtue known as charity (Schwartz, 2007).

Pope Benedict XVI has reinvigorated the use of the concept of caritas when he presented his first Encyclical letter titled Deus Caritas Est (Benedictus, 2005). The Pope called on Roman Catholic believers to recall the centrality of love in the Christian faith. The Pope detailed how love sustained the core of the faithful and is no longer a mere commandment to love another. He emphasized that human love is the response to God’s love. Pope Benedict XVI exhorted the religious faithful to respect the rights and needs of everyone; especially the poor, lowly, and defenseless and to perform charitable activities that are similar to those activities found in the story of the Good Samaritan (Benedictus, 2005; Bible Gateway, 2009, Luke 10:30-35).

Caritas is found in the fifth century Latin Vulgate Bible (2004) in First John 4:8 and First John 4:16 as “Deus caritas est” translated as “God is love.” Listed below is another example of caritas translated in the Christian Bibles used today, the first from the King James Version (KJV) and the second from the New International Version (NIV). Both examples are from Paul’s letters to the Corinthians, First Corinthians 13:13. KJV: “And now abideth faith, hope, charity these three, but the greatest of these is charity” (Bible Gateway, 2009); NIV: “And now these three remain: faith, hope, love. But the greatest of these is love” (Bible Gateway, 2009). These examples provide support that caritas is found in the Christian Bible; however, it
is the story of the Good Samaritan that has demonstrated the compassionate care that has become the historical standard of excellence for nurse caring (Ricoeur, 1992; Tuckett, 1999).

Similar to the Christian Bible, the Qur’an holds writings concerning charity between human beings as well as a relationship with God. Some of the writings are parables from the Old and New Testament lessons as the religious leaders outlined behaviors for Islamic followers. Charity is mentioned several times in the Qur’an, the following is one example:

Surah 2:177, Out of love for Him, for your kin, for orphans, for the needy, for the wayfarer, for those who ask, and for the ransom of slaves; be steadfast in prayer, and practice regular charity (Ali, 2002).

Levinas (Hand, 1989) recorded the written arguments and oral laws of Judaism found in the Talmud. The Talmud describes ethical relationships, which are established by the interactions with others and command justice (Hand, 1989). According to Levinas, an individual has a “responsibility to the suffering other” (Hand, 1989, p. 83). The assistance is in the form of offering persistent “affirming and strengthening” of the individual who is struggling for their vital existence (p. 83). Levinas does not indicate which specific action is necessary to help the suffering individual. However, he suggests that the suffering can be seen on the patient’s face, which causes the caregiver to develop an intuitive understanding (Rehnsfeldt & Erikkson, 2004). In Levinas’ view, the ethics and artistry of a relationship provides a wisdom that comes before clinical knowledge. This interpretation concurs with Watson’s Human theory of caring (2005). The relationship where two people glance, touch, or verbal exchange, connect with the infinity within each human being that shapes future knowledge and actions in a nurse caring relationship (Watson, 2005). There is an assumption that nurse caring is related to commitment,
intension, and a caring consciousness. Caritas becomes the ethic that is a prerequisite to engaging in nursing healing practices (Watson & Foster, 2003).

Another prominent nursing theorist pioneer, Leininger (1988a), incorporated beliefs of caring into the *Theory of transcultural nursing* as she qualitatively recorded her anthropological observations of nurses devoting time to listen to patients and mastering the technological challenges of modern day health care. She refers to caring as the dominant focus of nursing, and no other profession is as concerned with caring behaviors, caring processes, and caring relationships as nursing (Leininger, 1988a).

According to Leininger (1981), a culture of caring was a universal human phenomenon that varied across norms and had “biophysical, psychological, cultural, social, and environmental dimensions” (p. 11) and influenced individuals’ as well as groups’ wellness and illness patterns. Leininger was one of the first nursing theorists to identify caring as the “essence of nursing and the central, dominant, and unifying focus of nursing” (Leininger, 1991, p.35). Leininger divided the concept of caring into two components: emic and etic nurse caring. Culturally learned emic caring was transmitted by folk skills and local knowledge that provided support for another person. Professional or etic caring was formal, cognitively learned skills learned by the nurse and used to provide support or assist the patient in their healing process. Immersed in the patient’s environment, the nurse helped the patient and family make caring decisions and take actions to help the patient adapt to a health concern, illness, or injury. Leininger called these three modes of etic assisting: a) preservation/maintenance, b) accommodation/negotiation, or c) repatterning/restructuring that were aligned with the patient’s values influenced by society, culture, political, religious, education, technological and economic factors (Leininger, 1991).
Swanson developed a mid-range theory *Theory of caring* (1991) with five caring processes describing how nurses presented themselves when interacting with patients: knowing, being with, doing for, enabling, and maintaining belief. The patients reported the nurses who demonstrated these five caring processes provided excellent nurse caring while preserving human dignity, restoring humanity, and avoided reducing the person to the moral status of object. “Knowing” was the nurse understanding an event as interpreted by the patient (Swanson, 1991, p.163). “Being with” was the nurse’s emotional presence with the patient, and being able to share feelings without burdening the one being cared for (Swanson, 1991, p.163). “Doing for” entailed providing professional care competently, including comfort, anticipating needs, and protecting the other person (Swanson, 1991, p.164). “Enabling” included the nurse providing expert knowledge and allowing the patient and family to decide on options based on individual priorities and concerns (Swanson, 1991, p.164). “Maintaining belief” is the furtherance of enabling through the transition of decision making with a realistic, yet, optimistic attitude, which allowed the person to grow and actualize self, which echoes back to Mayerhoff’s writings in *On Caring* (1971) where the nurse helps someone to grow and mature (Swanson, 1991, p. 165).

**Consequence of Nurse Caring as Perceived by Patients.** Nursing researchers have documented multiple positive consequences when patient perceived high quality nurse caring in their healthcare environment. Swan (1998) reported that adult patient’s perception (n=100) of high amounts of nurse caring explained 9.3% to 18.2% improvement in patient’s functional status. In another study, Moon and Cho (2001) studied 62 patient’s perception of the effectiveness of nurse caring during an outpatient surgery. Of the intervention group (n=30), 96.7% reported decreased anxiety compared with the control group (n=32) of 78.1 % who received usual nurse interactions.
Erci et al.’s (2003) research suggests that nurse caring improved blood pressure trends for both systolic \((t (51) = 4.8, p <0.001)\) and diastolic \((t (51) = 3.51, p=0.001)\) when comparing pre-test to post-test readings. In addition, Wolf et al. (2003) reported a moderately strong relationship \((r=0.53, p=0.01)\) between patient satisfaction and nurse caring just prior to discharge from an outpatient cardiac unit. Finally, Berg and Danielson’s (2006) phenomenological study found that patients appreciated outpatient caring relationships that satisfied their unique needs. Patients dialogued that the caring nurse empowered them to ask questions and discuss their vulnerability, powerlessness, and frustrations with stress producing encounters when dealing with healthcare issues. The nurse’s action of accepting the patient’s reflection as part of the healing process allowed a caring relationship to develop between the nurse and patient that helped the patient regain their human dignity (Berg & Danielson, 2006).

**Nurse Caring in Phase II Cardiac Rehabilitation (CR).** Nurses in Phase II CR are a diverse group of individuals who provide nurse caring for patients and families with complex cardiovascular and other healthcare needs (AACVPR, 2004). Bittner (2001) provided a view of the pivotal role of the Phase II CR nurse in the recovery of a Phase II CR patient, who has the potential to become unstable and down spiral into a life-threatening situation. The researcher detailed the open and respectful relationship that developed between the nurse and patient as the nurse used critical thinking skills for problem solving (Bittner, 2001). Watson (1979) suggested in a nurse caring relationship the competent nurse makes intentional decisions based on the clinical assessment of the patient, provides psychosocial and physical comfort, educates patients and families about their condition, and maintains a safe and therapeutic environment that promotes individualized mutually agreed upon patient intervention and goals. Furthermore, Duffy and Hoskins (2003) suggest it is the responsibility of the nurse to establish an interactive,
independent relationship where the patient feels ‘cared-for’ and “a sense of security develops that makes it easier to learn new things, change behaviors, take risks, and follow guidelines” (p. 83). However, specific research that measures the patient’s perception of nurse caring in the Phase II CR was not found in the literature.

Adherence

While it has been established that Phase II CR participants have beneficial functional and psychological changes, adherence to the Phase II CR program is essential to accomplishing the results. This includes interacting with the nurse (AACVPR, 2004). In this study, attendance at the Phase II cardiac rehabilitation (CR) program is the measure identified as the initial step in adherence to a healthy lifestyle. According to statistics, 20% to 45% of the 21st century Phase II CR patients do not adhere to the full number of prescribed Phase II CR sessions (Lane, Carroll, Ring, Beevers, & Lip, 2001; Yohannes, Yalfani, Doherty, & Bundy, 2007).

Definition. Haynes, Taylor, and Sackett (1979) coined the term compliance and claimed that compliance was non-judgmental and interchangeable with adherence. Today, compliance has a negative connotation. Lutney and Wishner (1999) suggested that compliance is identified as the patient’s submission to the healthcare provider without regard for the patient’s independence, autonomy, or ability to take an active role in their own health care. Inherent in the definition of compliance are the assumptions that medical advice is good for the patient and following medical advice precisely is beneficial to the patient (Lutley & Wishner, 1999). An important ethical key to adherence is acknowledgement of the patient’s right to choose to follow treatment recommendations that are mutually agreed upon (Resnik, 2005). In the Phase II CR program, adherence focuses on the nurse-patient relationship and a voluntary cooperative
agreement of working towards the patient’s goals by both the patient and Phase II CR program nurse; making adherence more patient-centered than compliance (Resnik, 2005).

**Factors Influencing Adherence in Phase II CR Programs.** Research psychologists suggest that depression and anxiety impair recovery by preventing patients from adhering to goals set in the Phase II CR program. In the Heart and Soul Study, Ruo et al. (2003) used the 9-item Patient Health Questionnaire (PHQ) to assess for depression in 1,024 patients. The questionnaire had a range of scores from 0-27, with lower numbers indicating less depression. Mild depression scores were from five to nine, moderate depression from 10 to 19, and severe depression from 20 to 27. The researchers found that 20% of the patients (n=201) had moderate to severe depression with PHQ scores \( \geq 10 \). Depressed patients were more likely, compared to individuals without depressive symptoms, to report at least mild depressive symptoms (60% vs. 33%; \( p<0.001 \)), and mild physical limitation (73% vs. 40%, \( p<0.001 \)) that contributed to non-adherence (Ruo et al., 2003). A more recent study by Yohannes et al. (2007) suggests these findings continue. The researchers found that higher amounts of depressive symptoms were predictive of poor attendance in the Phase II CR (\( p<0.05 \)).

In addition, Kronish et al. (2006) and Ziegelstein et al. (2000) found that clinical depression detected in the hospital after a MI worsened adherence for attending the physician prescribed Phase II CR program [odds ratio (OR) = 0.5, 95% CI, 0.27-0.91]. The research teams concurred that the differences in adherence explained in part why depression predicted mortality after a MI (Kronish et al., 2006; Ziegelstein et al., 2000).

In contrast, Barnum’s (1999) reported that for 141 Phase II CR patients, their moods (anxiety and depression) improved as the program progressed, most noticeably during the first eight weeks of the Phase II CR program when using repeated measures ANOVA. Depression-
dejection followed a linear course of improvement (F [1, 103] =4.683, p<0.05). Tension-anxiety also followed a significant linear course of improvement (F [1, 103] =24.43, p< 0.001). Another statistically significant finding was the decrease in anxiety during the first four weeks that continued to improve over the entire 12-weeks of the Phase II CR program. In addition, high depression scores at week six were predictive of dropout before the 30th session (Barnum, 1999).

In another study, Glazer, Emery, Frid, and Banyasz’s (2002) included 46 participants enrolled in a 36-session Phase II CR to determine if psychological factors predicted adherence. The 21-item Beck Depression Inventory (BDI) was used to assess depressive symptoms and the 20-item STAI was used to assess anxiety. Lower scores indicate less distress for both the BDI and the STAI. Hierarchical regression analyses were conducted to predict attendance. Depression was found as a significant predictor, accounting for 39% of the variance (r² = 0.39, p< 0.05) in adherence. Anxiety predicted 22% of the variance of adherence (r² = .22, p< 0.01). When controlling for depression, anxiety did not predict adherence (p>0.05). In contrast, depression remained a significant predictor of non-adherence even when controlling for anxiety (r² = 0.08, p< 0.05). The researchers also analyzed the characteristics and reasons given by the 10 participants who attended less than 23 sessions. This group had a mean age of 53 ± 5.6 years, mean LVEF of 50% ± 16%. Seven were Caucasian, two African American, and one Latino. Seven were married, two never married, and one widowed. Seven were employed full time and three unemployed. The non-attendees also listed: medical problems with resulting surgery, hospitalization, or illness (n=3), work conflict (n=2), problems with insurance (n=1), moving (n=1), and loss of interest (n=1) as reasons of stopping their Phase II cardiac rehabilitation (CR) program.
Similar results were found in Turner, Bethell, Evans, Goddard, and Mullee’s (2002) study involving 1,902 Phase II CR patients. The researchers found that a patient with depression on admission to the Phase II CR program was twice as likely to default compared to a patient without depression (Odds ratio (OR) = 2.03; 95% CI, 1.30-3.19, p=0.001). These results were further supported by a recent study done by Casey, Hughes, Waechter, Josephson, and Rosneck (2008) of 600 Phase II CR patients. The researchers found that individuals with depression were 2.2 times less likely to complete a 12-week Phase II CR program compared to patients without depression.

**Significance**

The preceding review of the literature identified depression, anxiety, and adherence as complex concepts that influence cardiac recovery (Prochaska et al., 1994). Although research suggest that adherence to a Phase II cardiac rehabilitation (CR) reduces emotional distress short-term and mortality long term (Denollet & Brutsaert, 2001; Kronish et al., 2006; Ziegelstein et al., 2000) and supports the claim that Phase II CR is cost-effective (Cowper et al., 2007), these findings do not identify what the patient perceives as useful in a Phase II CR program. Research also supports nurse caring associations with improved blood pressures (Erci et al., 2003), patient satisfaction (Wolf et al., 2003), as well as reducing anxiety (Moon & Cho, 2001). However, the patient’s perception of nurse caring in the Phase II CR program was not found in the literature.

The present study seeks to add to the body of knowledge of nurse caring associated with Phase II CR patients, and may influence nurse caring in clinical practice, administration, research, education, and information systems. The information gained from this research aims to promote best practices that affect morbidity, mortality, and disability from cardiovascular disease (AACVPR, 2009).
Direct patient care staff nurses and administrators seek these results so they can develop protocols based on evidence specifically from Phase II CR patients that promotes an effective high-quality program based on theory. The Quality-Caring model® provides a logical framework for this study, since it acknowledges the patient, nurse, and patient’s outcomes (depression, anxiety, adherence), each as unique factors in the nurse-patient relationship (Duffy & Hoskins, 2003). Researchers seek the study results as an initial step towards a study that would look at a causal link between patient’s perceptions of nurse caring and patient outcomes, specifically depression, anxiety, and adherence in Phase II CR. In addition, the information could be used to influence basic nursing education departments since nurse employers would request more nurse caring education for future nurses. Clinical nurse educators would be requested to develop strategies such as continuing education sessions, self-paced learning, and reminder systems for staff nurses as continuous quality improvement initiatives to allow time to incorporate nurse caring into Phase II cardiac rehabilitation. In addition, information systems specialists could develop computer decision support systems, as well as audit and feedback for nursing staff performance and patient outcome evaluations to help administrators, nursing staff, and researchers in their efforts to provide quality patient care (Farquhar, Stryer, & Slutsky, 2002).
Chapter III

Chapter III includes the statement of the problem, research questions, statement of the purpose, and hypotheses. Chapter III also provides the description of the (a) research design, (b) setting, (c) sample, (d) instrumentation, (e) protection of human subjects, (f) procedure, and (g) data analysis.

Statement of the Problem

The relationship of the patient’s perception of nurse caring to depression, anxiety, and adherence of Phase II cardiac rehabilitation (CR) patients has received limited investigation.

Research Questions

Q1: What is the relationship between the perception of nurse caring and depression in Phase II CR patients?
Q2: What is the relationship between the perception of nurse caring and anxiety in Phase II CR patients?
Q3: What is the relationship between the perception of nursing caring and adherence in Phase II CR patients?

Statement of the Purpose

The purpose of this study is to determine if a relationship exists between the patient’s perception of nurse caring and depression, anxiety, and adherence in Phase II CR patients.
Hypotheses

Research Hypotheses

H₁: The perception of nurse caring will have an inverse relationship on depression in Phase II cardiac rehabilitation (CR) patients.

H₂: The perception of nurse caring will have an inverse relationship on anxiety in Phase II CR patients.

H₃: The perception of nurse caring will have a direct relationship on adherence in Phase II CR patients.

Statistical Hypotheses

H₀₁: There will be no relationship between the perception of nurse caring and depression in Phase II CR patients.

H₀₂: There will be no relationship between the perception of nurse caring and anxiety in Phase II CR patients.

H₀₃: There will be no relationship between the perception of nurse caring and adherence in Phase II CR patients.

Methodology

Research Design

This dissertation used the Quality-Caring model © (Duffy & Hoskins, 2003) as a framework to conduct a descriptive correlational study in at least one Phase II CR program (Wood & Ross-Kerr, 2006). The Pearson product-moment correlations was used to determine if a statistically significant relationship existed between the patient’s perception of nurse caring and Phase II CR patient’s adherence; Phase II CR patient’s perception of nurse caring and patient’s
depression; and Phase II cardiac rehabilitation (CR) patient’s perception of nurse caring and patient’s anxiety (Streiner & Norman, 2005).

**Setting**

The study was conducted in one Phase II CR program attached to a community non-profit hospital located in the mid-Atlantic region of the United States serving mainly a suburban population. The Phase II CR program had two professional registered nurses (RN) who works with the Phase II CR patients each session.

**Sample**

**Selection criteria.** Participants for this study included males and females enrolled in the Phase II CR program and had attended a minimum of four sessions. Four sessions were needed to allow the patient to get to know the nurse and evaluate how they were “cared-for” in the Phase II CR program (Duffy & Hoskins, 2003, p. 83). In addition participants were 18 years of age or older, able to understand and speak English, and orientated to person, place, and time.

**Sample size.** A purposive sample of 109 Phase II CR adults, based on power analysis, were asked to be participants in this study (Cohen, 1987, p.103). Since this wa a correlational study aimed at achieving a medium effect, the effect size is set at 0.30 (Cohen, 1987, p.80). Due to three univariate analyses, the alpha level was set at 0.01 in an effort to protect against an inflated alpha and a Type 1 error (Munro, 2005). Power is set at 0.80, which indicated an 80% chance of finding a statistically significant relationship, if a relationship exists (Cohen, 1987).
Instrumentation

Four instruments were used to collect the data for this study. The four tools include the following:

1. Center for Epidemiological Studies-Depression Scale
2. Spielberger State-Trait Anxiety Inventory- Y-1
3. Phase II CR Participant’s Data Sheet
4. Caring Assessment Tool© (Version IV)

The Center for Epidemiological Studies-Depression Scale (CES-D). The CES-D, a public domain instrument, was developed by the National Institute of Mental Health (NIMH) to assess depressive symptoms (Radloff, 1977) (see Letters of Permission A). The CES-D, 20-item paper and pencil, utilized a four-point Likert test (see Appendix A). Each item described symptoms that may be experienced occasionally by healthy people, but were experienced much more frequently by those with clinical depression. An item provided an opportunity for the participant to self-report how many times during the past week the individual experienced feelings such as loneliness, guilt, worthlessness, hopelessness, psychomotor difficulties, as well as appetite, sleep, and concentration changes (Radloff). The instrument was written on a fourth grade level, and took less than ten minutes to complete (American Association of Cardiovascular and Pulmonary Rehabilitation [AACVPR], 2006).

Each item was scored from zero (none of the time or less than one day) to three (most of the time or 5 – 7 days per week). The scoring was reversed in questions 4, 8, 12, and 16. The instrument total scores ranged from zero (low) to 60 (high), with the higher scores indicating the
presence of more depressive symptoms. Radloff and Locke (1986) recommended that a score above 16 be seen as potential cases of depression and that more testing needed to be done.

The CES-D was used to screen individuals with coronary heart disease with a Cronbach’s alpha of 0.86 (Wulsin et al., 2005). Another study found a Cronbach’s alpha of 0.84 for immediate post-MI patients and 0.86 after 3 months post-MI (Dunn, 2005). Swardfager et al. (2008) studied Phase II cardiac rehabilitation patients, but did not report the Cronbach alpha coefficient of the CES-D.

Validity. Construct validity was found to discriminate between known subgroups of patients: the general population earned an average score of 9 (Craig & Van Natta, 1976) while a psychiatric inpatient population with mixed diagnosis had scores of 24 to 38 (Weissman, Pottenger, Kleber, Ruben & Williams, 1977; Weissman, Sholomskas, Pottenger, Prusoff, & Locke, 1977). Divergent validity was illustrated in a sample of psychiatric inpatients of which 70% scored greater than 16, compared to 21% of the general population (Radloff, 1977). Historically, a cardiac patient with a score \( \geq 16 \) had a greater risk of subsequent cardiac mortality relative to non-cardiac patients (Blumenthal et al., 2003).

Discriminant validity correlated very high with scores on the Beck Depression Inventory, and Zung Self-Rating Depression Scale (Weissman, Prusoff, & Newberry, 1975). Convergent validity was also illustrated with correlations (0.61-0.72) with the Bradburn’s Affect Balance Scale, Langner’s 22 item scale (0.54 – 0.60) and Lubin Depression Adjective Check Lists (0.51 – 0.70) (McDowell, & Newell, 2006; Radloff, 1977). Radloff and Teri (1986) found the tool to yield consistent results across a varied age range of adolescents to frail elderly, indicating its appropriate use in this study of adult Phase II CR program participants (0.76 to 0.86). Similarly,
the national organization for cardiac rehabilitation, American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR), has identified this tool as appropriate for adult patients because items weigh less heavily on somatic symptoms of depression (AACVPR, 2006).

**Reliability.** Stability and internal consistency for the CES-D was established by split-halves method, Cronbach’s alpha, and test-retest correlations. Radloff (1977) determined the tool to be reliable when using the Spearman-Brown, split-halves methods that resulted in coefficients of 0.76–0.85 in the general population and even higher in the depressive patient sample of 0.90. The Cronbach’s alpha coefficient ranged from 0.85 to 0.92 (Radloff). Originally, the test-retest correlations were found to be moderate with ranges from 0.45 to 0.70 when first developing the tool (Radloff). Later, Radloff and Teri (1986) confirmed the instrument internal consistency reliability with the test-retest measures.

**Spielberger State-Trait Anxiety Inventory-Y-1.** Permission was received from the developer, Spielberger, for the State-Trait Anxiety Inventory (STAI-Y-1) to be used in this study (see Letters of Permission B). STAI measures State (S) Anxiety and Trait (T) Anxiety separately (see Appendix B). The tool was first developed in 1964 (Spielberger & Gorsuch, 1966); and with each update, which included factor analysis, was relabeled to the current tool label of STAI-Y (Spielberger, Vagg, Barker, Donham, & Westberry, 1980). Statements listed on the first page of the STAI-Y assess the patient’s S-Anxiety. Thus, this portion of the STAI instrument has become known as STAI-Y-1 (Spielberger, 1983).

The paper and pencil tool contained 20 weighted items that were answered by the patient on a four point Likert scale (1 = not at all, 2 = somewhat, 3 = moderately so, 4 = very much so). A rating of four indicated the presence of a high level of anxiety for ten S-anxiety items (e.g., “I
feel frightened,” “I feel upset”). Reverse coding was used on questions 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20. High ratings on these ten items indicated the absence of anxiety (e.g., “I feel calm,” “I feel relaxed”). After the reverse coding was completed, the overall score was added for the 20 items that make up the STAI-Y-1. The instrument total score ranged from 20 to 80 with the higher scores indicating higher anxiety (Spielberger, 1983, p. 12).

Researchers investigating anxiety among those undergoing CABG have used ≥ 45 as a score to designate those with clinically significant high S-anxiety (Khatri et al., 2001). The tool was written on a fourth grade reading level and took participants less than ten minutes to complete (Spielberger, 1983).

The STAI-Y-1 has been used with college students, military members, veterans, prisoners, and neuropsychiatric patients (Spielberger, 1983), and general medical-surgical inpatients (Burt, 2007) with a Cronbach alpha that ranged from 0.86 to 0.95. In addition, the tool has been used with several groups of cardiac patients. Koivula, Tarkka, Tarkka, Laippala, and Paunonen-Ilmonen (2001) used the STAI-Y-1 in a pre-operative, hospitalized, and 3 months post-operative CABG patients with a Cronbach alpha of 0.92., and 0.93 respectively. These were similar results to Fitzsimons, Parahoo, Richardson, and Stringer’s (2003) pre-operative CABG patients in Ireland where a Cronbach alpha of 0.95 was found for the STAI-Y-1. Similarly, An et al. (2004) used the STAI-Y-1 in their post-myocardial infarction study with a Cronbach alpha of 0.94.

**Validity.** Construct validity was tested by using contrast groups of military recruits, college and high school students as well as adults. The first reported test involved military recruits shortly after beginning a highly stressful training program whose scores were compared
to college and high school students of the same age. The mean State Anxiety scores were also evaluated when military recruits and college students were exposed to increased emotional turmoil, and significantly decreased after the participants were taught relaxation techniques. In addition, college students were given the S-Anxiety tool during normal conditions and then under stressful testing conditions. The scores elevated under the more stressful conditions and decreased as stress levels returned to baseline. Male and female scores were found to be similar (Spielberger, 1983).

Spielberger used several methods to validate the STAI-Y-1. Convergent validity was strengthened when the STAI-Y-1 was found to have highly positive correlations when given concurrently with assessment tests such as Minnesota Multiphasic Personality Inventory (MMPI), Cornell Medical Index, and Personality Research Form (PRF) (Spielberger, 1983).

**Reliability.** Stability and internal consistency for the STAI-Y-1 was established by test-retest, Cronbach alpha, and by item-remainder correlations. College students were exposed to relaxation and brief periods of stress by either taking a difficult IQ test or viewing a film with several accidents that resulted in serious injuries (Spielberger, 1983). The test-retest showed a variability between males and females (0.62 and 0.34 respectively), but similar results with a 30 day break between testing (0.62 to 0.51 for males and 0.34 – 0.36 for females). Cronbach alpha for college students, working adults, and individuals greater than 50 years of age revealed results of 0.91, 0.93, and 0.92 respectively (Spielberger). Further evidence of internal consistency of the STAI-Y-1 scale was provided by item-remainder correlations computed for the normative samples. The median S-Anxiety item-remainder correlation was 0.63 for the working adults and 0.59 for the college students (Spielberger, 1983).
**Phase II CR Participant’s Data Sheet.** A Phase II cardiac rehabilitation (CR) Participant’s Data Sheet (see Appendix C) for each adult Phase II CR participant was developed for this study to collect descriptive data from the participant’s current Phase II CR record. The form consisted of ten items including patients’ age, gender, diagnosis, number of comorbidities, number of sessions pre-authorized, number of sessions attended as well as a space for the scores from the percentage for attendance, CES-D, STAI-Y-1, and Caring Assessment Tool (CAT-IV). The tool was tested during the pilot for feasibility.

**Caring Assessment Tool (Version IV).** Permission was received to use The Caring Assessment Tool (CAT-IV) from the developer, Duffy, to be used in this study (see Letters of Permission C). The CAT-IV, a 36-item paper and pencil tool, used a five point Likert-type scale to “assess patients’ perceptions of nurse caring” (Duffy et al., 2007, p. 236). The English language tool was written on an eighth-grade reading level took participants 15 minutes to complete (see Appendix D). Each item score ranged from 1 (never) to 5 (always). The total score ranged from 36 to 180. The score represented the degree of nurse caring present in the nurse-patient relationship as perceived by the patient. In general, higher total scores indicated a higher patient perception of nurse caring (Duffy et al., 2007). The total score and item scores were used in this study.

**Validity.** The initial CAT contained 100 items. The evidence of content validity was based on recommendations from Burns and Groves (2005). First, the Caring Assessment Tool (CAT) was developed from multiple nursing theories. Second, Duffy organized an expert panel of eight nursing experts who systematically examined the original 100-item CAT. Included in the panel was the renowned nursing theorist, Watson (1979), who developed the *Theory of*
human care. The panel supported content validity (Duffy et al., 2007) when they were requested to comment on appropriateness of each item as a nurse caring behavior, the representativeness of each item to the Carative Factors (described in Chapter I) established in the Theory of human caring (Watson, 1979), and the general clarity of each item (Duffy, 1990). The updates of the original CAT to CAT-III, and were incorporated in Duffy’s (1990) dissertation.

To measure concurrent validity of the CAT, the Care-Q II (Larson, 1987) was used as a cross validation measure of the construct, caring (Duffy, 1990). Criterion validity was established when the CAT, which was theoretically generated, and the Care-Q II (Larson, 1987), which was empirically generated, had a significantly positive correlation with an $r = .7725$ (Duffy, 1990).

Successive support of validity of the CAT has been established in additional but unrelated studies done by Duffy (Burns & Groves, 2005). At the Thirteenth International Association of Human Caring conference, Duffy presented her research on nurse caring and inpatient satisfaction (Duffy, 1992). Approximately 19% of the variance in patient satisfaction was correlated with nurse caring (Duffy, 1992). Cardiac patients comprised 13% of each of the medical-surgical samples (Duffy, 1990; Duffy, 1992; Duffy, Hoskins, & Seifert, 2007).

The 100-item CAT was translated into multiple languages and used internationally (Duffy et al., 2007). However, nurses requested a shorter instrument to lessen the burden for the patient and the time constraint on the researcher (Duffy et al., 2007). Factor analysis was performed on data drawn from five American hospital ($n = 557$ adults) with data from participants with multiple diagnoses, socioeconomic backgrounds, gender, and ethnicity (Duffy et al., 2007, p. 238). The CAT-IV contained 36-items from the original pool of 100-items (Duffy et al., 2007).
et al., 2007). The new 36-item Caring Assessment Tool (CAT –IV) tool had a Cronbach alpha of 0.96, validating the internal consistency of the shortened tool (Duffy et al., 2007). Eight subscale factors defined the concept of nurse caring. The factors were labeled: a) mutual problem solving, b) attentive reassurance; c) human respect; d) encouraging manner; e) appreciation of unique meanings; f) healing environment; g) affiliation needs; h) and basic human needs (Duffy et al., 2007, p. 240).

**Reliability.** A Cronbach alpha of 0.98 was reported on the original 100-item tool (Duffy, 1990). The 36-item CAT (IV) has a Cronbach alpha of 0.96 (Duffy et al., 2007).

**Protection of Human Subjects**

Prior to data collection, approval was obtained from the School of Nursing, and the Committee for the Protection of Human Subjects at The Catholic University of America. In addition, written approval to conduct the study was obtained from the Institutional Review Board at the acute care facility attached to the outpatient Phase II cardiac rehabilitation (CR) program. Confidentiality was maintained by using a password-protected database, and storing the coded data in a securely locked cabinet away from the Phase II CR program.

The researcher held a meeting with the Phase II CR program administrator and staff where the study was described, purpose stated, and procedure explained. Each staff member received an informational handout that included the contact information for the researcher and a potential script to use if a patient inquired about the study (see Appendix E).

Then the nurse researcher met with potential subjects to discuss the study and answer their questions. The Phase II CR participant who met the selection criteria and agreed to participate was given an opportunity to read and sign an informed consent form (see Appendix
The informed consent contained an explanation of the study’s purpose, procedures, time requirement, potential risks and benefits, as well as subject’s rights to confidentiality, and withdrawal from the study at any time without penalty. A copy of the informed consent was kept by the participant and the other copy was kept by the nurse researcher.

During the discussion about the study, an emphasis was placed on the idea that the study is not connected with the administration of the usual Phase II CR program and that there are no correct answers to the Caring Assessment Tool-IV (CAT-IV) questions since it was based on the patient’s perception. In addition, the subjects was informed that declining or participating in the study would not affect the quality of care given in the Phase II CR program.

The nurse researcher explained that the signed informed consent allowed the nurse researcher access to the patient’s Phase II CR health records for information such as age, gender, diagnoses, number of comorbidities, attendance record, and the number of pre-authorized visits by the third party payer.

The informed consent, Participant’s Data Sheet, and three questionnaires were labeled with a numerical and alphabetical code, but the code did not match the participant’s name. Participants were informed that the questionnaire answers were anonymous, confidential, and would only be accessible to the researcher. The researcher kept a list of the identification codes with the informed consents in a private secure cabinet away from the research site that only the researcher could access. All data from the paper instruments, informed consents, and the list of codes were to be destroyed by shredding and burning two years after the completion of the dissertation. Following the completion of the study, the computer file data would be erased from the computer hard drive and the back-up flash drive would be destroyed as specified by Good
Clinical Guidelines (CFR 21 Part 50). Information such as demographic data would be used for statistical purposes and not used to discriminate against or identify a participant. The participant would be given the opportunity to receive a summary of the research findings upon completion of the study by adding their home address to the bottom of the informed consent.

**Procedure**

After approval from the Committee for the Protection of Human Subjects at CUA and the Institutional Review Board at the hospital, the following procedures was used to collect data.

1. The nurse researcher contacted the Phase II CR program administrator. A copy of the proposal, permission letters, and the data collection instruments was provided to the Phase II CR program administrator. At this same meeting, questions from the administrator were answered. Prior to initiating data collection at the Phase II CR site, a meeting with the multi-disciplinary staff was held. The administrator was assured that the patient’s permission would be obtained before collect information from the Phase II CR record. The name of the two nurses was obtained from the administrator.

2. The meeting with the multi-disciplinary staff that include the administrator and nurses allowed for a discussion concerning the purpose of the study, hypothesis, selection criteria, instruments used, and a suggestion on how to ask the patient if they are willing to be a participant. The team was notified of the coding method to protect the confidentiality of each participant. The staff was also informed that no experimental manipulation would take place and that the patient would be informed that the quality of care provided in the Phase II cardiac rehabilitation program would not be changed if the patient declined or chose to participate.
3. After approval, but prior to recruitment at the Phase II cardiac rehabilitation (CR) program site, advertisement of the study was displayed in a picture frame by the sign-in book for one week prior to starting the study (see Appendix G).

4. The researcher labeled 9” x 12” envelopes with numeric and alphabetical codes on the exterior top right hand corner. The same code was written on an informed consent, CES-D, STAI-Y-1, Phase II CR Participant’s Data Sheet, the Caring Assessment Tool (CAT-IV), and inserted into the coded envelope.

5. On the day of the meeting with the patient, the nurse researcher identify herself as a doctoral candidate from The Catholic University of America and the study briefly explained to potential participants. The subject was informed that the CAT-IV asked information concerning their perception of nurse caring since the start of their Phase II CR sessions. Identification of the Phase II CR staff nurses was provided to the participant by the nurse researcher pointing to and naming the nurses.

6. The patient was informed that if the screening tool scores for depression (CES-D ≥ 16) and anxiety (STAI-Y-I ≥ 45) were elevated that the staff nurse would be notified. The participant was given an opportunity to ask the nurse researcher questions regarding any aspect of the research.

7. The nurse researcher obtained a signed informed consent from patients agreeing to participate.

8. The completed informed consent was placed into a separate envelope designated for signed informed consents only.
9. Participants who agreed to participate were given the CES-D, STAI-Y-1, and CAT (IV) and a gratuitous gift, a $10 food coupon from the local market.

10. The participant were asked to complete the tools at that time while the nurse researcher was available to answer their questions.

11. If the participant requested to take the instruments with them to complete at another time, a stamped envelope with the nurse researcher’s address was given to the participant.

12. When the instrument has been completed and returned to the nurse researcher, the nurse researcher checked to assure of completion.

13. The completed instruments were placed back into the coded envelope that corresponded with the tool’s code, and then the coded envelope was sealed.

14. The nurse researcher accessed the patient’s Phase II cardiac rehabilitation (CR) record for the demographic data needed for the Phase II CR Participant’s Data Sheet.

15. The nurse researcher obtained the facility telephone number in case a need arose to contact the staff nurse.

16. The nurse researcher re-visited the Phase II CR program to obtain examine the Phase II CR record to determine the actual number of visits each Phase II CR participant completed.

17. The nurse researcher agreed to notify the institution if an adverse event occurred. No adverse events occurred.

18. Lastly, the instruments were scored and the results calculated.
Pilot Study

A pilot study was done to determine the logistical feasibility of the procedures that would take place. Ten volunteers from the purposive sample was used in order to assess the time constraints, protocols, and the ease of use concerning the data collection, instruments, and sample recruitment strategies in preparation for the full-scale study. Since the CAT -IV had not been used with Phase II CR participants a Cronbach’s coefficient alpha was calculated to determine a preliminary reliability. The participants from the pilot study were included in the larger study since the alpha level was greater than 0.70 (Polit, 1996).

Data Analysis

Two types of data analyses were applied to this study and performed by using the Statistical Package for Social Science (SPSS) for Graduate Students for Windows, Version 20.0 (2012). Descriptive statistics including the means, medians, frequency distributions, and standard deviations was used to describe the sample and analyze the demographic data. Pearson’s product-moment bivariate correlation was used for testing of hypotheses one through three. One-tailed hypotheses testing was calculated among the variables: participants’ perceptions of nurse caring and the participants’ adherence to the Phase II cardiac rehabilitation (CR) program, as well as the Phase II CR patient’s perception of nurse caring correlated to the participants scores on the CES-D and the STAI-Y-1 to determine if a significant relationship exists. Results of the description of the sample, data analyses, and hypotheses testing are reported in chapter four.
Summary

This chapter described the methodology of the proposed study. It included the following elements: a) statement of the problem, b) research questions, c) statement of the purpose, d) hypotheses, e) research design, f) setting, g) sample, h) selection criteria, i) sample size, j) instrument description, k) protection of human subjects, l) procedure, m) pilot study, n) collection of data, and o) data analysis.
CHAPTER 4

Findings

The purpose of this study was to determine if a relationship existed between the participant’s perception of nurse caring and depression, anxiety, and adherence in Phase II Cardiac Rehabilitation (CR) patients. Data were collected from a purposive sample that took place over a 12-month period. The Phase II CR outpatients lived in their homes located in an urban area between two large cities in the Mid-Atlantic portion of the United States. All patients who entered the Phase II CR program were asked to participate. Nine patients rejected the offer, immediately. One hundred twenty-four (124) participants met the study criteria and signed the informed consent. One hundred nine (N=109) participants completed three study questionnaires, two above the desired sample size of 107.

This chapter begins with a description of the participants who returned the three study questionnaires. A descriptive evaluation of the data collection instruments is presented second, and then hypothesis testing is reported. The chapter concludes with additional findings when relationships were explored with age, gender, depression, anxiety, and adherence.

Description of the Participants

Information about the characteristics of participants was derived from a review of the participant’s cardiac rehabilitation record. An investigator-developed form called Phase II Cardiac Rehabilitation Participant’s Data Sheet was used to record demographic information about the following participant’s characteristics: (a) gender, (b) age in years, (c) primary diagnosis, and (d) number of comorbidities (see Appendix C).
Gender and Age in Years

For the 109 participants (Males=66; Females=43), ages ranged from 40 to 88 years ($\bar{x}$=68, SD=11). The youngest participant was a 40-year-old female and the oldest participant was an 88-year-old male. Even though there was a greater number of males than females, the mean age ($\bar{x}$=68, SD=11) remained the same for both gender with one to three participants for every year of age. The youngest one-third of participants were below the age of 62 years (n=38). The second one-third of participants were between the age of 63 to 73 years (n=36). The oldest one-third of participants were 74 years of age and above (n=37).

Primary Diagnosis

Table 2 provides the frequency distribution for primary diagnoses that fell within seven categories. The total number of participants in each primary diagnosis category varied from seven to 27. Original primary diagnoses that did not have five or more participants were merged into the category called “All Others Diagnoses” (n=7), which captured the data for Pacemakers/Internal Coronary Defibrillators (n=2), stable angina (n=1), coronary artery disease (n=1), cardiomyopathy (n=1), and obesity (n=2) that contributed to coronary artery disease. The most frequent primary diagnosis for all males was a myocardial infarction (MI) with a stent (n=14, 21%). Female participant’s most frequent diagnosis was a stent without a MI (n=16, 37%). Forty-six (42%) participants had a primary diagnosis that included a cardiac surgical procedure prior to a myocardial infarction MI. In addition, 33 (30%) participants had a primary diagnosis that included a stent or coronary artery bypass graph after myocardial damage. Furthermore, 15 (14%) participants had a repair of the aortic or pulmonic valve that required a
cardiac surgical procedure that broke the breastbone similar to a coronary artery bypass graph (CABG). Thus, 86% of the participants were in recovery from a recent cardiac procedure.

Table 2

Frequency Distribution: Primary Diagnosis

<table>
<thead>
<tr>
<th>Primary Diagnoses</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stent (no MI) (^a)</td>
<td>27</td>
<td>25</td>
</tr>
<tr>
<td>CABG (no MI) (^b)</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>MI with Stent</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>Valve Repair</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>MI with CABG</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>MI (meds only) (^c)</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>All Other Diagnosis</td>
<td>7</td>
<td>6.4</td>
</tr>
</tbody>
</table>

N=109. \(^a\) MI-Myocardial Infarction, \(^b\) CABG-Coronary Artery Bypass Graph, \(^c\) MI (meds only)-Myocardial infarction- treatment modality is medications and lifestyle without surgery or procedures at this time.

Comorbidity

Table 3 displays nine comorbidity categories and the frequency of participants per category. The comorbidity data indicated that the 109 participants had 425 comorbidities, which included diseases such as hypothyroidism, hypertension, diabetes, and hyperlipidemia. Eighty-two percent (n=89) of the participants had two or more comorbidities. For participants with zero comorbidity, the mean age for males and females differed by a decade in life (Males=70 years; Females=60 years), otherwise ages were similar between males and females for each comorbidity category.
Table 3

*Frequency Distribution: Comorbidity Categories*

<table>
<thead>
<tr>
<th>Number of Comorbidities</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>10</td>
<td>9.2</td>
</tr>
<tr>
<td>One</td>
<td>10</td>
<td>9.2</td>
</tr>
<tr>
<td>Two</td>
<td>13</td>
<td>12.0</td>
</tr>
<tr>
<td>Three</td>
<td>19</td>
<td>17.4</td>
</tr>
<tr>
<td>Four</td>
<td>14</td>
<td>13.0</td>
</tr>
<tr>
<td>Five</td>
<td>14</td>
<td>13.0</td>
</tr>
<tr>
<td>Six</td>
<td>7</td>
<td>6.0</td>
</tr>
<tr>
<td>Seven</td>
<td>12</td>
<td>11.0</td>
</tr>
<tr>
<td>Eight or More</td>
<td>10</td>
<td>9.2</td>
</tr>
</tbody>
</table>

N=109.

**Evaluation of Instruments**

Three study instruments (a) The Center for Epidemiological Studies-Depression Scale (Radloff, 1977), (b) State-Trait Anxiety Inventory-Y-1 (Spielberger, 1983), and the (c) Caring Assessment Tool (IV) (Duffy et al., 2007) measured the depression, anxiety, and patient’s perception of nurse caring, respectively. The following section summarizes the score distribution, reliability, and item analysis for each tool. The Phase II Cardiac Rehabilitation Participant’s Data Sheet, described earlier in this chapter, and was used to record participant’s adherence data.
The Center for Epidemiological Studies-Depression Scale (CES-D)

Depression was measured with The Center for Epidemiological Studies-Depression Scale (CES-D), a 20-item questionnaire with a possible mean score range from zero to 60. Each item on the CES-D used a Likert scale with 0 representing Rarely or none, 1 representing Some, 2 representing Occasionally, and 3 representing Most of the time. Four items (4, 8, 12, and 16) were re-coded prior to data analyzes (see Appendix A). Higher scores indicated a higher level of depression and lower scores indicated a lower level of depression as perceived by the participant (Radloff, 1977). Radloff and Locke (1986), CES-D tool developers, recommend patients with CES-D scores of 16 or more be referred for a more extensive mental health assessment. The internal consistency reliability of the scale for this sample was Cronbach’s coefficient alpha of 0.87, which is similar to Dunn’s (2005) Phase II cardiac rehabilitation study where alpha was found to be 0.86.

For this study, the tool’s total mean scores ranged from zero to 38 (x =8, SD=8). Thirty-seven percent (n=41) of the total mean scores were between zero to three; with the most frequent total mean of three (n=16, 15%). In addition, 9% (n=11) of the participants were above the recommended referral score of 16 (Males: n=5; Females: n=6).

Descriptive statistics for the CES-D is presented in Table 4. Corrected item-total correlations ranged from 0.12 to 0.77. An item-total correlation of 0.2 or above measured depression in the Phase II cardiac rehabilitation participants. All but one item was above 0.2. The one item below 0.2 was item 15, which stated “People were unfriendly.” In general, participant’s mean item scores (range 0-3) revealed very little contrast between the highest and lowest scores. The item with the highest mean score was item 11, which stated “My sleep was
restless” (\(\bar{x} = 1.0, \ SD=1.0\)). The lowest mean score was item 15, which stated “People were unfriendly” (\(\bar{x} = 0.09, \ SD=0.37\)).

Table 4

*Descriptive and Test Item Statistics for the Center for Epidemiological Studies-Depression Scale (CES-D)*

<table>
<thead>
<tr>
<th>Item</th>
<th>(\bar{x})</th>
<th>SD</th>
<th>Item/Total</th>
<th>Item</th>
<th>(\bar{x})</th>
<th>SD</th>
<th>Item/Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.29</td>
<td>.66</td>
<td>.67</td>
<td>11</td>
<td>1.0</td>
<td>1.0</td>
<td>.22</td>
</tr>
<tr>
<td>2</td>
<td>.28</td>
<td>.75</td>
<td>.46</td>
<td>12</td>
<td>.56</td>
<td>.92</td>
<td>.46</td>
</tr>
<tr>
<td>3</td>
<td>.28</td>
<td>.67</td>
<td>.77</td>
<td>13</td>
<td>.46</td>
<td>.75</td>
<td>.40</td>
</tr>
<tr>
<td>4</td>
<td>.72</td>
<td>1.2</td>
<td>.20</td>
<td>14</td>
<td>.33</td>
<td>.71</td>
<td>.63</td>
</tr>
<tr>
<td>5</td>
<td>.69</td>
<td>.84</td>
<td>.55</td>
<td>15</td>
<td>.09</td>
<td>.37</td>
<td>.12</td>
</tr>
<tr>
<td>6</td>
<td>.29</td>
<td>.66</td>
<td>.73</td>
<td>16</td>
<td>.47</td>
<td>.83</td>
<td>.59</td>
</tr>
<tr>
<td>7</td>
<td>.50</td>
<td>.77</td>
<td>.64</td>
<td>17</td>
<td>.10</td>
<td>.45</td>
<td>.53</td>
</tr>
<tr>
<td>8</td>
<td>.77</td>
<td>1.1</td>
<td>.42</td>
<td>18</td>
<td>.28</td>
<td>.64</td>
<td>.53</td>
</tr>
<tr>
<td>9</td>
<td>.11</td>
<td>.42</td>
<td>.45</td>
<td>19</td>
<td>.11</td>
<td>.44</td>
<td>.28</td>
</tr>
<tr>
<td>10</td>
<td>.24</td>
<td>.59</td>
<td>.58</td>
<td>20</td>
<td>.65</td>
<td>.84</td>
<td>.59</td>
</tr>
</tbody>
</table>

N= 109. *Item Score Range = 0-3. bCorrected correlation.

**State-Trait Anxiety Inventory-Y-1 (STAI-Y-1)**

Anxiety was measured using the State-Trait Anxiety Inventory-Y-1 (STAI-Y-1), a 20-item questionnaire with scores ranging from 20 to 80. Each item on the STAI-Y-1 used a Likert Scale with 1 representing *Not at all*, 2 representing *Somewhat*, 3 representing *Moderately so*, and 4 representing *Very much so*. Ten items (1, 2, 5, 8, 10, 11, 15, 16, 19, and 20) were re-coded prior to running analysis (see Appendix B). Higher scores indicated a higher level of anxiety and lower scores indicated a lower level of anxiety as perceived by the participants (Spielberger,
Reliability of the STAI-Y-1 for this sample was a Cronbach’s coefficient alpha of 0.93. Koivula, Tarkka, Tarkka, Laippala, and Paunonen-Illonen (2001) had similar results with an alpha of 0.92.

For this study, the mean scores ranged from 20 to 66 (\(\bar{x}=30, SD=10\)). The most frequent total mean was 20 (n=22; 20%). Khatri et al. (2001) recommended that patients be referred for more extensive mental health assessment when the total STAI-Y-1 score was 45 or more. Nine percent (n=10) of the participants were above the score of 45. Descriptive and test item statistics for the STAI-Y-1 is presented in Table 5. Corrected item-total correlations ranged

Table 5

Descriptive and Test Item Statistics for State-Trait Anxiety Inventory-Y-1 (STAI-Y-1)

<table>
<thead>
<tr>
<th>Item</th>
<th>(\bar{x})</th>
<th>SD</th>
<th>Item/Total</th>
<th>Item</th>
<th>(\bar{x})</th>
<th>SD</th>
<th>Item/Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.5</td>
<td>.73</td>
<td>.61</td>
<td>11</td>
<td>1.6</td>
<td>.77</td>
<td>.58</td>
</tr>
<tr>
<td>2</td>
<td>1.5</td>
<td>.68</td>
<td>.71</td>
<td>12</td>
<td>1.4</td>
<td>.73</td>
<td>.58</td>
</tr>
<tr>
<td>3</td>
<td>1.5</td>
<td>.81</td>
<td>.59</td>
<td>13</td>
<td>1.3</td>
<td>.64</td>
<td>.60</td>
</tr>
<tr>
<td>4</td>
<td>1.4</td>
<td>.71</td>
<td>.61</td>
<td>14</td>
<td>1.5</td>
<td>.78</td>
<td>.57</td>
</tr>
<tr>
<td>5</td>
<td>1.6</td>
<td>.87</td>
<td>.53</td>
<td>15</td>
<td>1.7</td>
<td>.86</td>
<td>.68</td>
</tr>
<tr>
<td>6</td>
<td>1.3</td>
<td>.56</td>
<td>.62</td>
<td>16</td>
<td>1.7</td>
<td>.83</td>
<td>.74</td>
</tr>
<tr>
<td>7</td>
<td>1.6</td>
<td>.83</td>
<td>.66</td>
<td>17</td>
<td>1.6</td>
<td>.82</td>
<td>.66</td>
</tr>
<tr>
<td>8</td>
<td>1.7</td>
<td>.81</td>
<td>.60</td>
<td>18</td>
<td>1.2</td>
<td>.59</td>
<td>.51</td>
</tr>
<tr>
<td>9</td>
<td>1.3</td>
<td>.69</td>
<td>.46</td>
<td>19</td>
<td>1.8</td>
<td>.84</td>
<td>.63</td>
</tr>
<tr>
<td>10</td>
<td>1.6</td>
<td>.82</td>
<td>.71</td>
<td>20</td>
<td>1.6</td>
<td>.83</td>
<td>.56</td>
</tr>
</tbody>
</table>

N= 109.  a Item Score Range = 1-4.  b Corrected correlation.
from 0.46 to 0.74 with no items below a correlation of 0.2 suggesting that the tool measured anxiety in the Phase II cardiac rehabilitation participants well.

Table 6 presents a small contrast between the highest and lowest item means. Item 19 (I feel steady) had the highest item mean for 94 (86%) participants; while item 18 (I feel confused) had the lowest item mean for 103 (94.5%) participants.

Table 6

<table>
<thead>
<tr>
<th>Item #</th>
<th>Content Area</th>
<th>$\bar{x}$</th>
<th>SD</th>
<th>Item/Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highest Mean Scores</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19$^c$</td>
<td>I feel steady</td>
<td>1.79</td>
<td>0.84</td>
<td>.63</td>
</tr>
<tr>
<td>15$^c$</td>
<td>I am relaxed</td>
<td>1.72</td>
<td>0.86</td>
<td>.68</td>
</tr>
<tr>
<td><strong>Lowest Mean Scores</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>I feel upset</td>
<td>1.25</td>
<td>0.56</td>
<td>.62</td>
</tr>
<tr>
<td>18$^c$</td>
<td>I feel confused</td>
<td>1.21</td>
<td>0.59</td>
<td>.51</td>
</tr>
</tbody>
</table>

N=109. $^a$ Range 1-4 points. $^b$ Corrected correlation. $^c$ Recoded.

**Caring Assessment Tool -Version IV (CAT-IV)**

The participants’ perception of nurse caring was measured by the Caring Assessment Tool -Version IV (CAT-IV), a 36-item questionnaire with a range of scores from 36 to 180 (see Appendix D). Each item in the CAT-IV utilized a five-point Likert scale with 1 representing Never, 2 representing Rarely, 3 representing Occasionally, 4 representing Frequently, and 5 representing Always. Higher scores indicated a higher level of nurse caring as perceived by the participant, and lower scores indicated a lower level of nurse caring as perceived by the
participant (Duffy et al., 2007). Reliability of the scale from this sample was a Cronbach’s coefficient alpha 0.94, which is similar to Duffy et al. (2007) reliability ($\alpha=0.96$) reported at the time of the CAT-IV update.

The range of scores for the sample was from 69 to 180 ($\bar{x}=148$, SD = 25). Sixteen (15%) participants’ perception of nurse caring scored between 69 and 119. An additional 16 (15%) participants scored their perception of nurse caring between 179 and 180. Males scored their perception of nurse caring from 95 to 180 ($\bar{x}=150$, SD=23) and females scored the CAT-IV from 69 to 180 ($\bar{x}=145$, SD=27).

Table 7 presents statistics for the 36-items on the CAT-IV. Item to total correlation ranged from 0.24 to 0.73 suggested that all 36-items assessed the participants’ perceptions of nurse caring.
Table 7

Descriptive and Test Item Statistics for Caring Assessment Tool - Version IV (CAT-IV)

<table>
<thead>
<tr>
<th>Item</th>
<th>$\bar{x}$</th>
<th>SD</th>
<th>Item/Total</th>
<th>Item</th>
<th>$\bar{x}$</th>
<th>SD</th>
<th>Item/Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.7</td>
<td>.57</td>
<td>.33</td>
<td>19</td>
<td>3.5</td>
<td>1.8</td>
<td>.59</td>
</tr>
<tr>
<td>2</td>
<td>4.5</td>
<td>.83</td>
<td>.49</td>
<td>20</td>
<td>3.8</td>
<td>1.4</td>
<td>.73</td>
</tr>
<tr>
<td>3</td>
<td>4.9</td>
<td>.34</td>
<td>.33</td>
<td>21</td>
<td>4.0</td>
<td>1.4</td>
<td>.72</td>
</tr>
<tr>
<td>4</td>
<td>4.4</td>
<td>.87</td>
<td>.50</td>
<td>22</td>
<td>2.9</td>
<td>1.8</td>
<td>.59</td>
</tr>
<tr>
<td>5</td>
<td>4.6</td>
<td>.61</td>
<td>.58</td>
<td>23</td>
<td>3.4</td>
<td>1.6</td>
<td>.73</td>
</tr>
<tr>
<td>6</td>
<td>4.7</td>
<td>.52</td>
<td>.48</td>
<td>24</td>
<td>3.4</td>
<td>1.5</td>
<td>.69</td>
</tr>
<tr>
<td>7</td>
<td>4.6</td>
<td>.63</td>
<td>.52</td>
<td>25</td>
<td>3.4</td>
<td>1.6</td>
<td>.62</td>
</tr>
<tr>
<td>8</td>
<td>4.7</td>
<td>.53</td>
<td>.53</td>
<td>26</td>
<td>4.3</td>
<td>1.2</td>
<td>.69</td>
</tr>
<tr>
<td>9</td>
<td>4.8</td>
<td>.54</td>
<td>.50</td>
<td>27</td>
<td>4.5</td>
<td>1.0</td>
<td>.39</td>
</tr>
<tr>
<td>10</td>
<td>4.1</td>
<td>1.4</td>
<td>.57</td>
<td>28</td>
<td>3.7</td>
<td>1.7</td>
<td>.50</td>
</tr>
<tr>
<td>11</td>
<td>4.8</td>
<td>.48</td>
<td>.48</td>
<td>29</td>
<td>4.0</td>
<td>1.1</td>
<td>.65</td>
</tr>
<tr>
<td>12</td>
<td>4.5</td>
<td>.82</td>
<td>.55</td>
<td>30</td>
<td>4.5</td>
<td>1.1</td>
<td>.49</td>
</tr>
<tr>
<td>13</td>
<td>4.5</td>
<td>.87</td>
<td>.59</td>
<td>31</td>
<td>2.3</td>
<td>1.7</td>
<td>.50</td>
</tr>
<tr>
<td>14</td>
<td>4.4</td>
<td>.81</td>
<td>.72</td>
<td>32</td>
<td>4.1</td>
<td>1.4</td>
<td>.66</td>
</tr>
<tr>
<td>15</td>
<td>4.3</td>
<td>.96</td>
<td>.68</td>
<td>33</td>
<td>3.4</td>
<td>1.7</td>
<td>.65</td>
</tr>
<tr>
<td>16</td>
<td>4.3</td>
<td>1.0</td>
<td>.59</td>
<td>34</td>
<td>3.7</td>
<td>1.5</td>
<td>.72</td>
</tr>
<tr>
<td>17</td>
<td>4.6</td>
<td>.63</td>
<td>.58</td>
<td>35</td>
<td>3.1</td>
<td>1.9</td>
<td>.51</td>
</tr>
<tr>
<td>18</td>
<td>4.7</td>
<td>.69</td>
<td>.24</td>
<td>36</td>
<td>4.0</td>
<td>1.4</td>
<td>.66</td>
</tr>
</tbody>
</table>

N= 109. $^a$ Item Score Range = 1-4. $^b$ Corrected correlation.
Table 8 presents the participants’ perceptions of nurse caring as recorded on the Caring Assessment Tool - Version IV (CAT-IV), which illustrates a broader range of mean scores when compared to the contrast found for either the CES-D or STAI-Y-1 scores. Data suggest item 3 on the CAT (IV), “Treats me kindly” represents the highest level of nurse caring (\( \bar{x} = 4.9 \), SD = 0.34) for the 109 participants. The participants gave the lowest score to item 31, “Helps me with my special routine that I need for sleep” (\( \bar{x} = 2.3 \), SD = 1.7).

Table 8

*Highest and Lowest Total Mean Scores: Caring Assessment Tool - Version IV (CAT-IV)*

<table>
<thead>
<tr>
<th>Item #</th>
<th>Content Area</th>
<th>( \bar{x} )</th>
<th>SD</th>
<th>Item/Total (^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Highest total mean scores for participant’s perception of Nurse Caring</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Treats me kindly</td>
<td>4.9</td>
<td>0.34</td>
<td>.33</td>
</tr>
<tr>
<td>11</td>
<td>Pay attention to me when I am talking</td>
<td>4.8</td>
<td>0.48</td>
<td>.48</td>
</tr>
<tr>
<td>9</td>
<td>Accepts me as I am</td>
<td>4.8</td>
<td>0.54</td>
<td>.50</td>
</tr>
<tr>
<td></td>
<td><em>Lowest total mean scores for participant’s perception of Nurse Caring</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Talk openly to my family</td>
<td>3.1</td>
<td>1.9</td>
<td>.51</td>
</tr>
<tr>
<td>22</td>
<td>Make sure I get the food I need</td>
<td>2.9</td>
<td>1.8</td>
<td>.59</td>
</tr>
<tr>
<td>31</td>
<td>Help me with my special routine I need for sleep</td>
<td>2.3</td>
<td>1.7</td>
<td>.50</td>
</tr>
</tbody>
</table>

N=109. \(^a\) Range 1-5 points. \(^b\) Corrected correlation.
Adherence

The investigator-developed form called Phase II Cardiac Rehabilitation Participant’s Data Sheet was used to record the number of actual visits and the number of authorized visits to facilitate the calculation of adherence. Actual visits were divided by the number of authorized visits to determine the percent of adherence. Table 9 provides a frequency distribution for adherence. Higher scores indicated a higher percent of adherence. Lower scores indicated a

Table 9

*Frequency Distribution: Adherence*

<table>
<thead>
<tr>
<th>Adherence Percent</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>44</td>
<td>1</td>
<td>.9</td>
</tr>
<tr>
<td>56</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>64</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>72</td>
<td>1</td>
<td>.9</td>
</tr>
<tr>
<td>81</td>
<td>1</td>
<td>.9</td>
</tr>
<tr>
<td>86</td>
<td>1</td>
<td>.9</td>
</tr>
<tr>
<td>88</td>
<td>1</td>
<td>.9</td>
</tr>
<tr>
<td>92</td>
<td>3</td>
<td>2.8</td>
</tr>
<tr>
<td>96</td>
<td>1</td>
<td>.9</td>
</tr>
<tr>
<td>97</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>100</td>
<td>91</td>
<td>83.5</td>
</tr>
</tbody>
</table>

N=106.  *Range: 0-100.*
lower percent of adherence. Data were missing for three (3) participants (one male and two females), thus the analyses calculated information collected from 106 participants’ records after the final visit at the Phase II cardiac rehabilitation program. The range for adherence to the Phase II cardiac rehabilitation program was from 44 to 100% (\(\bar{x}=97, \ SD =9.9\)), only nine (10%) participants did not adhere to at least 92% of their authorized visits.

**Summary of Instrument Data**

Reliability analyses of the State-Trait Anxiety Inventory-Y-1 (STAI-Y-1) and the (c) Caring Assessment Tool (IV) demonstrated excellent internal consistency in this sample. Only one single item (#15) on the CES-D revealed a borderline assessment for depression in this sample. Otherwise, the Center for Epidemiological Studies-Depression Scale demonstrated excellent internal consistency in this sample of Phase II cardiac rehabilitation participants.

**Hypothesis Testing**

**Research Hypotheses**

The research hypotheses for this study included:

**Ha1**: The perception of nurse caring will have an inverse relationship on depression in Phase II CR patients.

**Ha2**: The perception of nurse caring will have an inverse relationship on anxiety in Phase II CR patients.

**Ha3**: The perception of nurse caring will have a direct relationship on adherence in Phase II CR patients.
Zero Order Correlation

Table 10 presents the zero-order correlations among the three independent variables (depression, anxiety, and adherence) and one dependent variable (participants’ perception of nurse caring).

Table 10

Zero Order Correlation Matrix for Study Variables

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CAT-IV</td>
<td>-</td>
<td>-.22*</td>
<td>-.18*</td>
<td>.09</td>
</tr>
<tr>
<td>2. CES-D</td>
<td>-</td>
<td>-</td>
<td>.75**</td>
<td>-.26**</td>
</tr>
<tr>
<td>3. STAI-Y-1</td>
<td>-</td>
<td>-</td>
<td>-.15</td>
<td></td>
</tr>
<tr>
<td>4. % Adherence</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

CAT-IV= Caring Assessment Tool-IV (N=109); CES-D=Center for Epidemiological Statistics-Depression (N=109); STAI-Y-1= State-Trait Anxiety Inventory-Y-1(N=109); % Adherence: percent based on N=106.

* Correlation is significant at the .05 level (1-tailed). **Correlation is significant at the .01 level (1-tailed).

To examine the relationship between depression and participants’ perception of nurse caring for 109 participants, the Pearson product-moment correlation coefficient was used. The results indicated there was a statistically significant weak inverse linear relationship ($r = -.22$, $p = .05$) for participants’ perception of nurse caring and depression. As the Caring Assessment Tool-IV (CAT-IV) scores increased, which measured the participant’s perception of nurse caring, scores on the Center for Epidemiological Statistics-Depression (CES-D), which measured depression, decreased.

The Pearson correlation coefficient was used with the CAT-IV scores and the State-Trait Anxiety Inventory-Y-1 (STAI-Y-1) scores to examine the association between the participant’s
perception of nurse caring and anxiety. The results indicated there was a small statistically
significant inverse linear relationship between the perception of nurse caring and anxiety
\( r = -0.18, p = 0.05 \). This result suggested that as the participant’s perception of nurse caring
increased, STAI-Y-1 scores that measured anxiety decreased.

To examine the relationship between nurse caring (CAT-IV scores) and percent of
adherence, the Pearson product-moment correlation coefficient was utilized. The results
suggested a non-significant positive relationship \( r = 0.09, p > 0.05 \), indicating that as the CAT-
IV scores increased; the relationship with the participant’s adherence to the Phase II Cardiac
Rehabilitation program did not significantly change.

**Additional Findings**

**Depression, Anxiety, and Adherence**

Additional findings included a very strong positive statistically significant linear
correlation between depression and anxiety \( r = 0.75, p = 0.01 \), and a small negative statistically
significant relationship between percent of adherence and depression \( r = -0.26, p = 0.01 \) for
109 participants.

**Regression**

Stepwise regression was conducted to estimate a model that best predicted levels of
perception of nurse caring, depression, anxiety, and adherence among this cohort of Phase II
Cardiac Rehabilitation participants. The dependent variable was the mean score for the Caring
Assessment Tool-IV (CAT-IV). Independent variables were entered in the following order: (a)
depression (CES-D), (b) anxiety (STAI-Y-1), and (c) adherence based on partial correlation
coefficient. An 0.05 alpha was set as the level for statistical significance.
The analysis revealed that depression emerged as the strongest predictor with a beta of -0.22 \((p<0.05)\), which accounted for 5\% of the variance in the participant’s perception of nurse caring (see Table 11).

Table 11

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>df of F</th>
<th>(R^2) Change</th>
<th>Standardized Beta</th>
<th>F (b)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Depression (CES-D)</td>
<td>1, 104</td>
<td>0.05</td>
<td>-0.22</td>
<td>5.5</td>
<td>0.02</td>
</tr>
</tbody>
</table>

\(a\) N=109. \(b\) = Value of F when variable entered into the model.

Table 12 provides a summary of anxiety and adherence that were statistically non-significant in the stepwise regression. The results provided three insights: (a) multicollinearity was low, (b) anxiety had an inverse relationship with the CAT-IV scores, and (c) adherence held a positive relationship with CAT-IV scores.

Table 12

<table>
<thead>
<tr>
<th>Variable</th>
<th>t</th>
<th>(p)</th>
<th>Collinearity VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>-0.32</td>
<td>0.75</td>
<td>2.292</td>
</tr>
<tr>
<td>Adherence</td>
<td>0.34</td>
<td>0.74</td>
<td>1.069</td>
</tr>
</tbody>
</table>

\(N=109.\)

**Caring Assessment Tool-IV 36-items**

The Phase II cardiac rehabilitation participant’s scores on each of the 36-items that comprised the Caring Assessment Tool –IV (CAT-IV) were evaluated using the eight subcategories also known as Factors (Duffy et al., 2007). A Pearson product moment correlation
was used to analyze the correlation of CAT-IV 36-items and study variables: depression, anxiety, adherence, gender and age at the 0.01 level (2-tailed).

Male and female data were divided into age cohorts and called younger and older. The younger cohort ages ranged from 40 years to 68 years of age \((n=55)\). The older cohort ages ranged from 69 years to 88 years of age \((n=54)\). Thirty-five participants were younger males and 31 participants were older males. Twenty (20) participants were younger females and 23 participants were older females. Factor VI, Healing environment was the only subscale that was found significantly correlated between the participants’ perception of nurse caring and depression, anxiety, and adherence. Factor I, Mutual problem solving, and Factor V, Appreciation of unique meaning were not found to be correlated at the 0.01 level (2-tailed) with any of the 36-items on the CAT-IV.

Table 13 presents the analysis completed on depression (CES-D scores) and the 36-item CAT-IV. Significant correlational findings were not found for males at the 0.01 level (2-tailed). Twelve items were significant for younger females and one item was significant for older females. CAT-IV categories included: a) Factor II, Attentive reassurance; b) Factor III, Human respect; c) Factor was Factor VI, healing environment; and d) Factor VIII, Basic human needs.
Table 13

*CAT-IV Item Analysis: Depression, Gender, and Age Cohort*

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Question</th>
<th>r</th>
<th>r²</th>
<th>p</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger Females</td>
<td>1: Listen to me</td>
<td>-.58</td>
<td>.34</td>
<td>0.01</td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>2: Help me to believe</td>
<td>-.61</td>
<td>.37</td>
<td>0.01</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>3: Treat me kindly</td>
<td>-.76</td>
<td>.58</td>
<td>0.01</td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>5: Pay attention to me</td>
<td>-.65</td>
<td>.42</td>
<td>0.01</td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>6: Are available</td>
<td>-.67</td>
<td>.45</td>
<td>0.01</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>7: Check up on me</td>
<td>-.58</td>
<td>.34</td>
<td>0.01</td>
<td>VI</td>
</tr>
<tr>
<td></td>
<td>8: Make me feel comfortable</td>
<td>-.59</td>
<td>.35</td>
<td>0.01</td>
<td>VI</td>
</tr>
<tr>
<td></td>
<td>11: Pay attention to me when I am talking</td>
<td>-.68</td>
<td>.46</td>
<td>0.01</td>
<td>VI</td>
</tr>
<tr>
<td></td>
<td>13: Help me feel less</td>
<td>-.56</td>
<td>.31</td>
<td>0.01</td>
<td>VIII</td>
</tr>
<tr>
<td></td>
<td>17: Seem interested in me</td>
<td>-.76</td>
<td>.58</td>
<td>0.01</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>18: Respect me</td>
<td>-.76</td>
<td>.58</td>
<td>0.01</td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>26: Support my sense of</td>
<td>-.71</td>
<td>.50</td>
<td>0.01</td>
<td>II</td>
</tr>
<tr>
<td>Older Females</td>
<td>11: Pay attention to me when I am talking</td>
<td>-.54</td>
<td>.29</td>
<td>0.01</td>
<td>VI</td>
</tr>
</tbody>
</table>

N109. Younger=40-68 years; Older = 69-88 years. Correlation is significant at the 0.01 level (2-tailed).

Table 14 provides data on the three significant inverse correlational findings from the Caring Assessment Tool-IV (CAT-IV) item scores and anxiety measured with the STAI-Y-1.

Younger females were not found to have responses significantly correlated for anxiety at the
The significant CAT-IV subcategories included: a) Factor II, Attentive reassurance; b) Factor VI, Healing environment; and c) Factor VII, Affiliation needs.

Table 14

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Question</th>
<th>r</th>
<th>$r^2$</th>
<th>p</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger Males</td>
<td>#2: Help me to believe in myself</td>
<td>-.50</td>
<td>-.25</td>
<td>0.01</td>
<td>II</td>
</tr>
<tr>
<td>Older Males</td>
<td>#19: Are responsive to my family</td>
<td>-.47</td>
<td>-.22</td>
<td>0.01</td>
<td>VII</td>
</tr>
<tr>
<td>Older Females</td>
<td>#11: Pay attention to me when I am talking</td>
<td>-.57</td>
<td>-.32</td>
<td>0.01</td>
<td>VI</td>
</tr>
</tbody>
</table>

N109. Younger = 40-68 years of age. Older = 69-88 years. Correlation is significant at the 0.01 level (2-tailed).

Table 15 presents the analysis completed for adherence and the CAT-IV’s 36-items.

Significant correlational findings were not found for younger males at the 0.01 level (2-tailed).

Six items were found to be significantly correlated for younger females, older males, and older females. The CAT-IV categories included: a) Factor III, Human respect; b) Factor IV, Encouraging manner; c) Factor VI, Healing environment; and d) Factor VIII, Basic human needs.
Table 15

**CAT-IV Item Analysis: Adherence, Gender, Age Cohort**

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Question</th>
<th>$r$</th>
<th>$r^2$</th>
<th>$p$</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger Females</td>
<td>15: Allow me to choose the best time to talk</td>
<td>.80</td>
<td>.64</td>
<td>0.01</td>
<td>IV</td>
</tr>
<tr>
<td>Older Males</td>
<td>31: Help me with my special routine I need for sleep</td>
<td>-.46</td>
<td>.21</td>
<td>0.01</td>
<td>VIII</td>
</tr>
<tr>
<td>Older Females</td>
<td>1: Listen to me</td>
<td>.54</td>
<td>.29</td>
<td>0.01</td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>3: Treat me kindly</td>
<td>.82</td>
<td>.67</td>
<td>0.01</td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>11: Pay attention to me when I am talking</td>
<td>.53</td>
<td>.28</td>
<td>0.01</td>
<td>VI</td>
</tr>
<tr>
<td></td>
<td>14: Anticipate my needs</td>
<td>.54</td>
<td>.29</td>
<td>0.01</td>
<td>II</td>
</tr>
</tbody>
</table>

N=106. Younger = 40-68 years. Older = 69-88 years. Correlation is significant at the 0.01 level (2-tailed).

**Summary**

Chapter 4 presented demographic and instrumental data, which described 109 Phase II cardiac rehabilitation participants and their responses to the three study questionnaires. Pearson product-moment correlation was completed for hypothesis testing. The chapter concludes with additional analysis of the CAT-IV subcategories also called factors. Chapter 5 discusses these findings.
CHAPTER 5

Summary, Discussion, Conclusions, Implications, Recommendations

The purpose of this chapter is to summarize and discuss the findings, draw conclusions, and recommend how these results can be implemented in nursing practice, administration, nursing education, nursing research and health care policy. This chapter will be presented as follows: a) summary, b) discussion, c) conclusions, d) implications for nursing, and e) recommendations.

Summary

Cardiovascular disease remains the number one illness experienced by Americans (Rosamond et al., 2008). Meta-analysis of randomized controlled trials have found outpatient, Phase II cardiac rehabilitation (CR) effective in reducing mortality for these individuals (Taylor et al., 2004). Despite evidence of improved health outcomes for adherence, up to 45% of participants have been reported to drop out of the Phase II CR programs (Yohannes et al., 2007). Research studies have identified depression and anxiety as barriers to adherence in Phase II CR programs (Glazer et al., 2002; Schulz et al., 2000; Swardfager et al., 2008). A few studies have reported nurse caring may promote successful patient outcomes (Berg & Danielson, 2006; Duffy & Brewer, 2011; Moon & Cho, 2001; Wolf et al., 2003). However, in spite of studies on depression, anxiety, adherence, and nurse caring, investigators have limited evidence that the patient’s perception of nurse caring is correlated to depression, anxiety, and adherence for Phase II CR patients. Thus, the purpose of this study was to determine if a relationship existed between the participants’ perception of nurse caring and depression, anxiety, and adherence. Duffy’s (1990) Quality-caring model © provided a logical framework since it acknowledged the
patient, nurse, and the patient’s outcomes (depression, anxiety, adherence) as unique factors in a nurse-patient relationship (Duffy & Hoskins, 2003). The research hypotheses for this study were: $H_{a1}$: The perception of nurse caring will have an inverse relationship on depression in Phase II cardiac rehabilitation (CR) participants. $H_{a2}$: The perception of nursing caring will have an inverse relationship on anxiety in Phase II CR participants. $H_{a3}$: The perception of nurse caring will have a direct relationship on adherence in Phase II CR participants. This quantitative descriptive correlational research design enrolled a convenience sample of 109 Phase II CR participants who met the selection criteria. The setting was a Phase II CR program attached to a non-profit hospital located in the mid-Atlantic region of the United States serving a suburban population. Two registered nurses were employed by the facility to provide outpatient nursing services in the Phase II CR program for patients recovering from cardiovascular surgeries, myocardial diseases, and to prevent further healthcare problems (Anne, 2006).

Data were collected through the administration of three instruments. The Center for Epidemiological Studies-Depression Scale (Radloff, 1977) was used to measure depression. The State-Trait Anxiety Inventory-Y-1 (Spielberger, 1983) was used to measure anxiety. The Caring Assessment Tool – IV (CAT-IV) was used to record the participant’s perception of nurse caring (Duffy et al., 2007). The Phase II CR Patient’s Data Sheet, designed by the researcher, was used to record demographic (age, gender, number of comorbidities, and primary diagnosis) and adherence data from each of the participant’s CR health record. SPSS 20.0 was used to perform Pearson product moment correlation for hypotheses testing and further exploration of the data.
Discussion

The following section discusses the pilot, issues experienced in the study, reliability of the instruments, hypotheses results, serendipitous findings, and ends with the nurse caring factors.

Pilot

A pilot study was conducted to establish the feasibility of the Caring Assessment Tool-IV (CAT-IV) in the outpatient setting. Data was collected from ten Phase II cardiac rehabilitation (CR) participants who met the criteria for the study sample. The CAT-IV was established as reliable ($\alpha= 0.94$) and no changes in research design were required. The results of the pilot were incorporated into the data for the full study.

Issues

Initially, this researcher had received invitations to do Phase II CR research at five outpatient facilities in the mid-Atlantic region by the direct patient care Phase II CR nurses. However, when walking through the requests, the policy makers for the Phase II programs prohibited this research to be started. Some administrators feared the Health Insurance Portability and Accountability Act thus blocked this study. The single facility that allowed this research was a facility striving for Magnet status with a nurse researcher who understood the research risks and values of nursing research.

Two concerns developed after the pilot concluded. The first concern dealt with where the participants would complete the three questionnaires. Originally, the study was set up for the participants to complete the questionnaires at the Phase II CR site with an option to complete the forms at home and return it by mail to the researcher. During the first two data collection days in
the Phase II cardiac rehabilitation (CR) program, the participants sat completing the forms at the Phase II CR site. They were observed to hurriedly complete the questionnaires instead of reading them closely, handed them to the researcher, and then rushed out the door. When asked about this behavior, the participants explained that when they completed their physical exercise session they were ready to relax. However, the questionnaires made them critically think, which was more taxing than they had anticipated. To address this issue, participants were reminded of the option to take the questionnaires to read and think about in the peace and quiet of their home. This option became the norm instead of the alternative, and the number of participants increased.

The third concern was the cohort of participants with depression and anxiety scores that were above the referral point. As agreed upon at the beginning of the study, this investigator notified the Phase II CR nurses of participants with high scores for depression or anxiety. The nurses stated they re-assessed the emotional status of each patient, no matter what the screening tool indicated, for mental and physical health concerns as each individual entered the session and throughout the exercise period. The nurses shared that external factors such as family, financial, or insurance concerns may change from one visit to another, or a new diagnosis would require nursing interventions that may range from onsite counseling by the registered nurse or a referral to a doctor for further assessment. The discussion of changing patient conditions allowed the nurses to share that two of the nine participants who did not complete the Phase II CR program were newly diagnosed with cancer. This was an unforeseen diagnosis, yet provided more insight into real life non-adherence for Phase II CR participants. As far back as the 1980s similar predictors for participants’ dropping out of Phase II CR have been found by researchers (Oldridge et al., 1983). However, today evidence provided by researchers report that a
structured exercise program similar to Phase II cardiac rehabilitation (CR) can contribute to improved fatigue, mood, and physical functioning for at least 75% of participants (n=39) with cancer (Hanna, Avila, Meteer, Nicholas, & Kaminsky, 2008). Therefore, the two participants will most likely return to a structured exercise program that promotes a healthy lifestyle once the participant after the acute treatment phase.

**Reliability of Instruments**

The following discussion reviews reliability, items, and scores for the Center for Epidemiological Studies-Depression Scale, State-Trait Anxiety Inventory-Y-1, and the Caring Assessment Tool-Version IV.

**Center for Epidemiological Studies-Depression Scale (CES-D).** In this study the CES-D was used to measure depression. The internal reliability was favorably established (α =0.87) by a corrected item-total correlation. The 20 item-total correlation values ranged from 0.12 to 0.77. One item was below 0.2, which was item 15, “People were unfriendly” suggesting that this one item did not measure the construct of depression well. This item may have scored low due to the lack of heterogeneity of the sample since these participants consisted of volunteers from one Phase II CR program instead of a sample from the general population. In other words, the participant’s scores may have been too similar since item-total correlations look for difference (Polit & Beck, 2004, p. 422).

In addition, the participants’ depression scores indicated a low level of depression for 37% (n=41) of participants. Historically, research has shown that patients with cardiac disease have depression. What is new from this study is that the mean score was low (x̄=8, SD=8) and 15% (n=16) of participants had a mean of three, suggesting non-depression for these participants.
In previous national and international studies, scores for depression started around 12 and extended above the referral point of 16 (Blumenthal et al., 2003; Surtees et al., 2008; Wulsin et al., 2005). The results from this study need to be examined closer to capture their full meaning. It is possible that participants were already on anti-depressant medications or had been seen by a counselor for depression, since the number or type of medications and doctors were not collected for analysis.

**State-Trait Anxiety Inventory-Y-1 (STAI-Y-1).** For this study, internal reliability was favorably established for the STAI-Y-1 (α=0.93) that measured anxiety. Corrected item-total correlations ranged from 0.46 to 0.74 with no items below a correlation of 0.2 suggesting that the tool measured anxiety well in the Phase II cardiac rehabilitation participants. The STAI-Y-1 Cronbach alpha in this study was similar to other cardiac patient research (An et al., 2004; Koivula et al., 2001).

In this study, the most frequent score was 20 (n=22, 20%), which suggests low levels of anxiety for one-fifth of the participants. However, on the other extreme, nine percent of the participants (n=10) were above the score of 45, the recommended referral point (Khatri et al., 2001). In Barnum’s (1999) Phase II cardiac rehabilitation (CR) study, a linear decrease in anxiety scores were recorded from the time a participant checked into the Phase II CR program until the participant completed the program (F (1, 103) = 24.4, p < .001). Turner et al. (2002) evaluated 1, 443 Phase II CR patients and found that anxiety decreased by the conclusion of the Phase II CR for women (p=0.008). A future study that intentionally identified the session number of when the participant answered the questionnaire may add understanding of the
relationship between anxiety and nurse caring to determine if the association is varied from session to session or a linear progression.

**Caring Assessment Tool - Version IV (CAT-IV).** In this study, internal reliability was favorably established for the CAT-IV ($\alpha= 0.94$) that measured participants’ perceptions of nurse caring. Item to total correlation ranged from 0.24 to 0.73 suggesting that all 36-items assessed the participants’ perception of nurse caring well. The range of scores for this study was from 69 to 180 ($\bar{x}= 148$, $SD = 25$). Sixty-six percent of the CAT-IV scores were between 120 and 178, which was a medium to high score for nurse caring. An additional fifteen percent (n=16) of participants gave the highest possible CAT-IV scores of 179 and 180. These results are similar to Duffy and Brewer (2011) acute care participants’ (n=1,402) scoring on the CAT-IV considered as medium to high values for nurse caring ($\bar{x}= 158.4$, $SD=24$).

This study would have benefited from a mixed methods component for participants who gave scores of 120 or less on the CAT-IV (n=16). The answers to a semi-structured interview would have enriched the understanding of the current quantitative data and allowed an opportunity for participants to express their opinions.

**Hypotheses**

Pearson product-moment correlation coefficient tested the relationships identified in the three research hypotheses proposed for this study. The first two research or alternative hypotheses ($H_{a1}$) were supported, and the third research hypothesis was not. The following section discusses each hypothesis, findings, and suggestions for future research.
Research Hypothesis 1 (Hₐ₁): The perception of nurse caring will have an inverse relationship on depression in Phase II CR participants.  Hₐ₁ was supported by the data in this study.  The Pearson product-moment correlation coefficient results indicated there was a statistically significant small inverse linear relationship (r = - 0.22, p=0.05, one-tailed) for the variables participants’ perception of nurse caring and depression on the Center for Epidemiological Studies-Depression Scale; as the participants’ perception of nurse caring increased, depression scores decreased.  Depression explained 4.8% of the variance in the participants’ perceptions of nurse caring.  Thus leaving more than 95% of the variance for the variable, participants’ perceptions of nurse caring, unaccounted for, which introduces the idea that there may be unidentified variables since the relationship is weak.  After reviewing the correlational data for these two variables, the statistical hypothesis, there will be no relationship between the participants’ perception of nurse caring and depression in Phase II cardiac rehabilitation (CR) participants was rejected; and the research hypothesis (Hₐ₁) was supported.

The weak relationship may be related to the fact that depression scores were generally low, and only high in about 10 participants (9%).  It is also possible that participant’s depression decreased shortly after beginning the Phase II CR program (Dunn, 2005).  Blumenthal et al. (1999) study suggested that the Phase II CR program participants with or without medications, no longer had depression after 44 sessions.  However, Blumenthal and colleagues’ study did not indicate what techniques or personnel were the most effective in reaching their conclusion.  Thus research continues to explore the best method to help participants to deal with frustration and anger which are common symptoms of depression (American Psychological Association, 2000).  A phenomenological study done by Berg and Danielson (2006) suggested that patients felt
empowered by nurses who allowed them to ask questions and discuss their frustrations with the healthcare system. In this study, anecdotal observations revealed that the two registered nurses who worked in the Phase II CR program encouraged questions, listened, and discussed multiple topics. In addition, one of the highest mean scores that indicated an association between depression and nurse caring on the Caring Assessment Tool-IV was item 11, “Pays attention to me when I am talking” ($\bar{x}=4.8$, SD=0.48). This deserves additional analysis so quality care can be provided in the Phase II cardiac rehabilitation (CR) program.

**Research Hypothesis 2 ($H_{a2}$): The perception of nursing caring will have an inverse relationship on anxiety in Phase II CR participants.** $H_{a2}$ was supported by the data in this study. The Pearson product-moment correlation coefficient results indicated there was a small statistically significant inverse linear relationship between the participants’ perception of nurse caring and anxiety scores ($r=-0.18$, $p=0.05$ one-tailed). As the perception of nurse caring increased, anxiety scores decreased. Anxiety explained 3.2% of the variance in the participants’ perception of nurse caring. This result reveals more than a 96% variance unaccounted for in the participants’ perception of nurse caring, which is considered a weak relationship and hints that additional variables maybe involved. After further review the statistical hypothesis, there will be no relationship between the participant’s perception of nurse caring and anxiety in Phase II cardiac rehabilitation (CR) participants was rejected; and the research hypothesis was supported.

For this study, the mean anxiety scores ranged from 20 to 66 ($\bar{x}=30$, SD=10). The highest number of participants scored the lowest possible anxiety score of 20 (n=22; 20%). Further analysis indicated there was a small contrast between the highest and lowest scores on
the STAI-Y-1 (1.79 verses 1.25). In addition, only nine percent (n=10) of participants’ were above the score of 45, the referral point for a formal mental health assessment by a psychologist.

These results suggest participants in this sample had low levels of anxiety when they answered the questionnaires. It could be that participants who enrolled in the Phase II cardiac rehabilitation (CR) program had low levels of anxiety to begin with or these results could reflect nurse caring practices similar to Moon and Cho (2001), and Swan (1998) nurse caring studies, but not caught during this quantitative study. Thus, a mixed methods study to re-examine this phenomenon would be beneficial to the clarification of nurse caring behaviors and the correlation with anxiety.

Research Hypothesis 3 (Hₐ₃): The perception of nurse caring will have a direct relationship on adherence in Phase II CR participants. Hₐ₃ was not statistically supported by the data in this study. The Pearson product-moment correlation coefficient results suggested a small non-significant direct relationship (r = 0.09, p = 0.05 one-tailed). The data suggested that as the participants’ perceptions of nurse caring increased, statistically, adherence did not change. Participants’ perceptions of nurse caring explained 0.8% of the variance in adherence. Thus, more than 99% of the variance in adherence is unaccounted for and could be related to a variable other than participants’ perception of nurse caring. Therefore, the statistical null hypothesis that there will be no relationship between the participants’ perceptions of nurse caring and adherence in Phase II CR participants was accepted, and the research hypothesis was not supported.

The results of this hypothesis where participants’ perceptions of nurse caring was not found to make a significant impact on adherence was not anticipated. In a previous study, Saran et al. (2003) analyzed the association between the nurse’s therapeutic relationship and adherence
in dialysis patients. The researchers found an odds ratio of 0.84 per 10% increase in adherence \( (p = 0.02) \) with an increase in the participants’ perception of the skill of the nurse’s ability to implement a therapeutic relationship. A possible explanation for the difference in findings between this study and Saran et al. (2003) is that patients with cardiac disease are significantly different than dialysis patients. A more plausible explanation is that the statistics for this study looked at adherence as a single variable; perhaps adherence needs to be broken down into the various reasons for not attending the sessions and then analyzed with multiple regression analyzes.

Despite the lack of statistical support from the correlation for this hypothesis, this sample of Phase II cardiac rehabilitation (CR) participants had an adherence rate of 92%, which yields an 8% drop-out rate. The current national average for Phase II CR drop-out rate continues between 20% and 45% (Lane et al., 2001; Yohannes et al., 2007). It is plausible that participants in this study adhered to the Phase II CR program since they knew they were part of a study. Therefore, it would be beneficial for Phase II CR program administrators, who aim to control costs and provide quality services, to facilitate a research study that collected data from high adherence programs and compares the data with low adherence programs to determine if professional nurse caring is an effective intervention to improving adherence.

**Serendipitous Findings**

The Pearson product-moment correlation matrix provided additional associations between depression and anxiety, depression and adherence, as well as to comorbidity and primary diagnosis. These correlations are worth noting in the search for an indepth
understanding of participants’ perception of nurse caring, depression, anxiety, and adherence.

The following section discusses the findings and presents suggestions for additional research.

**Depression and Anxiety.** The Pearson product-moment correlation coefficient showed a large linear statistically significant positive correlation between depression and anxiety ($r = 0.75$, $p=0.01$). The statistics suggested that as depression increased, anxiety scores increased. Depression explained 56.3% of the variance in the anxiety. The results are similar to other studies where depression and anxiety were found in patients’ with cardiac disease (Glazer et al., 2002; Rozanski et al., 2005).

Healthcare studies continue to seek insight into depression and anxiety with the aim of helping the patient recuperate faster. Blanc et al. (2007) reported that women have higher levels of anxiety and depression at the start of Phase II cardiac rehabilitation (CR) program compared to men. However, the researchers also reported these same women’s anxiety and depression symptoms improved faster than men in the study. Therefore, further qualitative and quantitative exploration of age and gender influences on depression and anxiety would be of value. Since the Phase II CR nurses use evidence-based practices, the identification of age and gender appropriate therapeutic interventions could be implemented by the nurse with the intent of helping the Phase II CR patients recuperate as fast as possible.

**Depression and Adherence.** The Pearson product-moment correlation revealed there was a small negative statistically significant inverse relationship between percent of adherence and depression ($r = -0.26$, $p=.01$) for the 109 Phase II CR participants. The statistics suggested that as depression scores decreased, adherence increased. Depression explained 6.8% of the variance in the adherence. The negative impact of depression on adherence is not an
unanticipated finding. Other studies reported that participants with depression were three times more likely to be non-adherent to healthcare recommendations (Casey et al., 2008; Kronish et al., 2006; Ziegelstein et al., 2000).

**Comorbidity and Primary Diagnosis.** In this study, comorbidity and primary diagnosis were not found significantly correlated to any of the variables. This was not anticipated since previous research suggested these two variables impacted an individual’s recovery trajectory. In Denollet and Brutsaert’s (1998) study followed participants (n=150) for nine years then reported worsening of the participant’s mood (p=.001) for those who had standard medical care for multiple health diseases plus left ventricular dysfunction after a myocardial infarction, which required multiple therapies such as thrombolytic therapy. Cowper et al. (2007) wrote that even though Phase II CR programs were cost-effective for participants, that the severity of the coronary bypass surgery and short hospital stays negatively impacted participants’ recovery. These reports support healthcare provider anecdotal reports often heard from Phase II cardiac rehabilitation program nurses. However, Burt (2007) evaluated (n=85) acute care patients’ (older than 65 years of age) severity of illness, nurse caring, age, gender, anxiety, and co-morbidities. Similar to this study, comorbidity and severity of illness were not individually associated with any other variables. Thus, comorbidity and diagnosis deserve more study, but data may need to be combined to determine if specific diseases such as diabetes and bypass grafts correlate with age, gender, anxiety, or depression more frequently than hypothyroidism and myocardial infarction.
Participants’ Perceptions of Nurse Caring and Caring Assessment Tool (CAT-IV) Factors

The reliability of the CAT-IV in this study was anticipated ($\alpha=0.94$) since two prior studies revealed similar alphas. Duffy et al. (2007) study for medical-surgical inpatients ($n=577$) revealed an alpha of 0.96, and Duffy and Brewer (2011) study ($n=1,402$) revealed an alpha of 0.98. In addition to reliability, an exploration of the eight factors that comprised the CAT-IV was conducted. A correlational matrix using the 109 Phase II cardiac rehabilitation (CR) participants’ anxiety scores, depression scores, adherence, age cohort (younger and older), and gender were used to determine if an association existed between the 36-item CAT-IV scores. The analysis with an alpha of 0.01 revealed that six out of eight nurse caring factors were identified by the Phase II CR participants: (a) Attentive Reassurance, (b) Human Respect, (c) Encouraging Manner, (d) Healing Environment, (e) Affiliation Needs, and (f) Basic Human Needs (Duffy et al., 2007). When the alpha was adjusted to 0.05 further items in Factor I, Mutual Problem solving, Factor IV, Encouraging manner and Factor VI, Healing Environment were found to have additional moderately strong significant correlations. However, Factor V, Appreciation of unique meanings, was not found statistically significant at the 0.01 or 0.05 level (2-tailed). The following summary reviews the data collected for the seven factors that comprise the CAT-IV, anecdotal observations of the researcher during data collection at the Phase II CR program, and ends with a discussion of the findings.

**Factor I, Mutual Problem Solving.** Factor I, mutual problem solving, includes nurse caring behaviors that “helped patients and families understand how to confront, learn, and think about their health and illness” (Duffy, 2009, p. 67). Five items were included in Factor I (item 21, item 23, item 24, item 25, and item 29) (Duffy et al., 2007). No items were correlated at the
0.01 level (2-tailed). Two items were found significantly correlated with the variables: gender, age, adherence, depression, and anxiety at the 0.05 level (2-tailed). Item 25, “Help me figure out questions to ask other health care professional” was negatively correlated between younger females and depression ($r = -0.48, p=0.05$). Item 29, “Ask me how I think my health care treatment is going” was negatively correlated for younger males and anxiety ($r = -0.41, p=0.05$), and younger females and depression ($r = -0.49, p=0.05$).

Anecdotal observations of the nurses’ interventions revealed that the patients were engaged by the nurse upon arrival at the Phase II cardiac rehabilitation (CR) program and multiple health issues were discussed. Referrals to other healthcare providers and the rationale for seeking another appointment were often discussed. Then at the next visit in the Phase II CR program, the patient and nurse would discuss the healthcare issue again to see how the treatments were going. The process that the Phase II CR nurses used to develop this therapeutic relationship is not new in health care literature. Other individuals such as Fisher and Ury (1991) presented a four step method of problem-solving to meet the patient’s goals. The problem-solving steps included: a) discuss the issue, b) listen, c) create options to solve the problem, and d) develop an agreement that combined as many goals as possible (Search, 2003). Recently completed research by Brown et al. (2013) found the more experienced the healthcare provider with the four-step method the better the patient with anxiety and depression adhered to the health care suggestions.

The three items not found to be significantly correlated in Factor I were: a) item 21, “Help me understand how I am thinking about my illness; b) item 23, “Help me explore alternative ways of dealing with my health problems;” and c) item 24, “Ask me what I know
about my illness.” Perhaps the participants did not understand the questions or misread the item. Or perhaps the participants’ were getting fatigued by the middle to end of the questionnaire. It is plausible the nurses did not use the exact words used in item 21 and item 24, but a mixed methods study would be helpful in examining the reasons these three items received scores that were non-significant.

**Factor II, Attentive Reassurance.** Factor II refers to the “potential for a hopeful outlook” (Duffy, 2009, p. 68). A total of five items comprised Factor II, attentive reassurance (item 2, item 6, item 14, item 17, and item 26) (Duffy et al. 2007). All five items were significantly correlated with the variables at the 0.01 level. Item 2, “Help me believe in myself,” had two significant associations between variables: gender, age, adherence, depression, and anxiety. Negative correlations were found between depression and younger females ($r = -0.61$, $p=0.01$); and anxiety and younger males ($r = -0.50$, $p=0.01$). Item 6, “Are available to me,” had associations among gender, age, and depression. Negative correlations were found between younger females and depression ($r = -0.67$, $p=0.01$). Item 14, “Anticipates my needs,” had a positive correlation between older females and adherence ($r = 0.54$, $p=0.01$). Item 17, “Seem interested in me,” had negative associations between younger females and depression ($r = -0.76$, $p=0.01$). Item 26, “Support my sense of hope,” had a negative correlation between younger females and depression ($r = -0.71$, $p=0.01$).

Additional findings when alpha was set at 0.05 were found for items 2, item 6, item 17, and item 26. Item 2 had negative correlations for younger females and anxiety ($r = -0.49$, $p=0.05$) and younger males and depression ($r = -0.40$, $p=0.05$) and a positive correlation for younger males and adherence ($r = 0.40$, $p=0.05$). Item 6 had a negative correlation between
younger males and depression ($r = -0.34, p=0.05$). Item 17 revealed a negative correlation between younger females and anxiety ($r = -0.48, p=0.05$). In addition, item 26 had a negative association between younger females and anxiety ($r = -0.46, p=0.05$).

Through anecdotal observations, the nurses were seen to be physically within three to 50 feet from the participants at any one time and were assessing exercisers’ body language and tones of voice. The nurses’ reactions towards a patient who made an unexpected posturing or breathing pattern changed caused the nurses’ to move towards the patient, who may be walking on a treadmill. The participant was assessed and then offered a bottle of water, or encouraged to sit on a bike or rest for an additional minute to recover after the most recent exercise challenge.

In addition, nurses often taught patient about topics that promoted patient independence. One such topic was how to use the Borg scale while exercising. The Borg scale provided the exerciser a method to rate their feelings of how hard they were exercising. The participants were assured by the nurse that they were being monitored by telemetry while they mastered their skills in using the subjective tool. A picture of the Borg scale hung on the wall for the participants to look at as they reported to the nurse their perception of exertion. The more the participant practiced, the quicker they were able to label their exertion level (AACVPR, 2004, p. 80). As the patient reported their Borg Scale score, the nurse and participant negotiated the next step in progressing the patient’s exercises. The nurse also used a printed visual graphic from the patient’s computerized record as an objective teaching tool to reinforce the participant’s feelings of making progress. The participant often agreed to hand-carry the Phase II cardiac rehabilitation periodic reports to their healthcare provider so they could relay their achievements.
Often the patients were observed to be smiling as they exited the exercise session with their reports in-hand.

It was also noted by this investigator that some participants would ask questions as they started to exercise, which drew the nurse into a short discussion. After this brief encounter, the participant could be seen quietly looking out the window as they walked on the treadmill. It was as if the observer could see the participant contemplating the last conversation and weighing their options. Intermittently, the participant would ask the nurse an additional question on another aspect of the topic. This combination of being allowed to ask questions, thinking, and asking additional questions allowed the participant to have assurance they had the attention of the nurse when they were ready to discuss their concerns. Often by the end of the session, the participant would report back to the nurse their next step. These methods of encouragement and reassurance along with pragmatic communication skills were therapeutically used by the nurses to promote the participants’ “hopeful outlook” for recovery. However, a future mixed methods study would be beneficial to confirm that participants were confident, or hopeful as thought to be observed by this researcher, thus empowered to overcome depression and anxiety.

Factor III, Human Respect. Factor III reminds the nurse, regardless of age or physical capacity, that the patient is more than just a disease. Human respect includes “honoring the person with unconditional acceptance, calling the person by their preferred name, careful handling of the human body, and recognition of the person’s rights” (Duffy, 2009, p. 69). Duffy et al. (2007) included five items in Factor III (item 1, item 3, item 5, item 9, and item 18). In this study, four items were found to have significant correlation among the variables: age, gender, depression, and adherence at the 0.01 level. Item 1, “Listen to me” had a positive
association between older female participants and adherence ($r = 0.54$, $p=0.01$). Item 1, also had a negative correlation between younger females and depression ($r = -0.58$, $p=0.01$). Item 3, “Treat me kindly,” had a strong negative association between younger female and depression ($r = -0.76$, $p=0.01$). Item 3, also had a large positive correlation between older females and adherence ($r = 0.82$, $p=0.01$). Item 5, “Pay attention to me,” was found to be negatively associated between younger females and depression ($r = -0.65$, $p=0.01$). Item 18, “Respect me,” was found to be negatively associated between younger females and depression ($r = -0.76$, $p=0.01$).

Additional items were found to have moderately strong correlations at the 0.05 level. Item 1, revealed younger women and anxiety were negatively correlated ($r = -0.56$, $p=0.05$). For item 5, younger females and anxiety were again negatively correlated ($r = -0.50$, $p=0.05$). Item 9, revealed three significant negative correlations. Younger women and anxiety ($r = -0.50$, $p=0.05$), younger women and depression ($r = -0.56$, $p=0.05$), as well as older women and depression ($r = -0.42$, $p=0.05$).

Anecdotal observation of the nurses’ behaviors revealed that the nurses stood erect, faced the patient, made eye contact, smiled, and welcomed the participants with an optimistic statement as they attached the tele-monitor to the participant’s chest. Additionally, the nurses called the patient by their requested name (Duffy, 2009, p. 69). Nurses also compassionately helped patients with physical requirements such as putting the patient’s foot on the bicycle pedal since some of the participants were too weak to raise their leg and foot to place it on the pedal themselves. This display of kindness suggested that the nurse was honoring the patient’s efforts. In addition, this researcher overheard the nurses’ discuss with the patient on how to get out of
bed by rolling to their side to help reduce the pain from their recent open chest surgery.

Furthermore, the nurses provided positive verbal feedback to the patient acknowledging their effort required to find transportation to the program for a specific time devoted to healing since many participants were not allowed to drive their automobiles. These nurse caring behaviors were also evident when the nurse placed the telemetry on the patient’s chest. The nurse initiated a conversation and listened to how the patient answered the welcoming question, “How are you feeling today?” This rather simple question was used to open communication between the nurse and patient to discuss issues of concern to the patient. Sometimes these quiet conversations, which were within the personal space of the patient, were moved to a private table and two chairs, in the back of the exercise facility, to allow for a more intimate discussion. Other times, after starting the conversation with the registered nurse, the patient would agree to talk with another Phase II cardiac rehabilitation participant who had also experienced the same challenge.

**Factor IV, Encouraging Manner.** Factor IV, encouraging manner, describes the nurses’ demeanor when teaching the participants. Through the patient-nurse caring relationship, the patient learns to draw on intrinsic motivation to grow, as the nurse shows enthusiasm for the patient’s effort (Duffy, 2009). Duffy et al. (2007) included six items in Factor IV (item 4, item 10, item 12, item 15, item 32, and item 33). This study found one item (item 15) significantly correlated at the 0.01 level among the variables: age, gender, and adherence. Item 15, “Allow me to choose time to talk,” had a large positive correlation between younger females and adherence ($r = 0.80, p=0.01$). Anecdotal observations revealed that the nurses were onsite at the Phase II CR program every session and talked with each participant every session. The
participants often asked questions throughout their exercise sessions of the nurses then they returned to their exercises.

Three additional items were found to have moderate correlations at the 0.05 level (2-tailed). Item 4, “Encourage me to ask questions,” revealed a negative correlation between younger females and depression ($r = -0.52, p=0.05$). Item 10, “Support my beliefs,” had a negative correlation between older females and anxiety ($r = -0.45, p=0.05$). Item 12, “Help me see some good in my situation,” had a positive correlation between older females and adherence ($r =0.50, p=0.05$).

Anecdotally the researcher observed the nurses’ gently challenging for each patient to increase the duration of their exercises with an overall increase of about one to two minutes per session. As the patient developed their endurance the nurse would then encourage the participant to increase the intensity of their exercises, within the Phase II CR protocols. All the while, the participants watched the nurse observing the telemetry for cardiac arrhythmia, and then checking their vital signs. The nurses also encouraged participants to attend group sessions for stress management and nutritional guidance. A qualitative study by Liebel, Powers, Friedman, and Watson (2012) found a similar nurse caring relationship provided encouragement for patients that empowered the participants to accomplish their goals (p.85).

A few participants wrote on their Caring Assessment Tool-IV (CAT-IV) that they did not want the nurse to be religious. Thus, item 10 needs further qualitative study to determine a more precise interpretation of participants’ perceptions for “Support my beliefs.” In addition, item 32, “Encourage my ability to go on with life,” and item 33, “Help me deal with bad feelings,” were both found to be statistically non-significant. One participant wrote on the CAT-IV that they did
not anticipate the nurse to counsel them on their feelings in the middle of an exercise session. In addition, two participants wrote that they did not have “bad” feelings. On review of the individuals’ data, low depression and anxiety scores were found. Thus, a mixed methods study would be beneficial to challenge the nursing belief that participants experiencing recovery after surgery or an illness have “bad” feelings.

**Factor VI, Healing Environment.** Factor VI is the healing environment, the setting where nurse caring is taking place (Duffy, 2009). “The vibrancy of the nurse, teamwork, and access to spiritual resources enhance the environment and has the opportunity to improve patient outcomes. The healing environment allows patients to ask questions and encourages them to learn from their mistakes in a non-punitive manner” (Duffy, 2009, p. 70-71). Duffy et al. (2007) identified five items for Factor VI (item 7, item 8, item 11, item 27, and item 30). In this study, three items (item 7, item 8, and item 11) were identified by participants as significant for correlations at the 0.01 level among age, gender, depression, anxiety, and adherence. Item 7, “Check up on me,” was negatively correlated between younger women and depression \((r = -0.58, p=0.01)\). Item 8, “Make me feel as comfortable as possible,” had a negative association for younger women and depression \((r = -0.59, p=0.01)\). Item 11, “Pay attention to me when I am talking,” had a positive correlation between older women and adherence \((r = 0.53, p=0.01)\). Item 11 also had a negative correlation between older women and depression \((r = -0.53, p=0.01)\); older women and anxiety \((r = -0.57, p=0.01)\); and younger women and depression \((r = -0.59, p=0.01)\).

Additional items were found to have correlations at the 0.05 level (2-tailed). Item 8, “Make me feel as comfortable as possible,” indicated a positive correlation between older
women and adherence ($r = 0.44, p=0.05$). Item 8, negative correlation between older women and depression, ($r = -0.44, p=0.05$); older women and anxiety ($r = -0.42, p=0.05$). Item 11, younger women and anxiety ($r = -0.45, p=0.05$). Item 27, “Respect my need for privacy,” had a positive correlation for younger women and adherence ($r = 0.54, p=0.05$). Item 30, “Treat my body carefully,” indicated negative correlations between younger women and depression ($r = -0.48, p=0.05$), and older women and depression ($r = -0.51, p=0.05$).

Anecdotally, the researcher observed the nurses to offer a glass of water when checking on a patient. Another therapeutic technique used by the nurses when participants were exceptionally silent during the exercise session, was the use of humor in the form of cub-scout-aged jokes that enlivened the atmosphere in the exercise facility. These jokes allowed an out-loud chuckle to a full belly laugh, which then caused many participants to smile (Kataria, 2011). The jokes were often ice breakers thus allowing participants to become more comfortable with their surroundings.

The items that comprised Factor VI, healing environment, were found significant by women, but not male participants. Perhaps the vibrant environment encouraged the women to acknowledge their own needs and encouraged them to voice their concerns. Anecdotal observation found women talking to other Phase II cardiac rehabilitation (CR) patients in small groups of two or three, as they all exercised. Topics included: family, life’s experiences, leisure activities, health concerns, and recently learned nutrition topics. The women bonded so well that a supper group was started that continued after the Phase II CR program was completed. The women offered the opportunity for all participants to join the supper support group; however, the women were the members who attended the suppers. Additional research on the relationship
between a healing environment and male participants would allow for a fuller understanding of this phenomenon.

**Factor VII, Affiliation Needs.** Factor VII, affiliation needs, refers to “a desire to belong to a family or other social entity” (Duffy, 2009). The professional nurse is to initiate the therapeutic nurse caring relationship and encourage the patient and family to become involved with healthcare decisions and practices (Duffy, 2009). Factor VII has three items (item 19, item 28, and item 35). In this study, one of the three items (item 19) was significantly correlated at the 0.01 level among the variables of gender, age, and anxiety. Item 19, “Are responsive to my family” was negatively correlated between older males and anxiety ($r = -0.47, p=0.01$). At the 0.05 level (2-tailed), item 19 was negatively significantly correlated for older males and depression ($r = -0.36, p=0.05$). In addition, item 28, “Allow my family to be involved,” was negatively correlated for older males and anxiety ($r = -0.38, p=0.05$).

Anecdotal observation revealed that only older women sat in the designated family area watching their male partners exercise. Specific nursing interventions that promoted communication with family members included: a) taking time to answer questions, often repeatedly, b) explaining the telemetry that helped the nurse monitor the participant, c) providing literature on topics of concern for the family member to read during the exercise session or taken home, d) and a chair for the family member to sit and watch their loved one, or talk and listen to other family members who were also sitting on the sidelines. Initially, this researcher thought the actions of the significant other was smothering the participant with kindness due the patient’s recent illness. However, perhaps the family members staying within the exercise area on the sidelines was a silent communication between their significant other that relieved the family
member’s anxiety as well as the patients. This will need to be explored in another study since this is speculation based on body language of the participant that was not verified.

Item 35, “Talk openly to my family,” was not found to be significantly correlated to the variables. It is possible that nurses did not talk openly to family due to concerns of privacy about personal health information and requirements of the Health Insurance Portability and Accountability Act that requires the patient’s consent prior to discussions. Anecdotal observation noted that the nurses taught about lifestyle topics in group classes since so many participants had the same health risks. Thus, a mixed methods study would be beneficial to explore the participants’ qualitative remarks in greater depth for both items in Factor VII that were found to be non-significantly correlated to participants’ perception of nurse caring.

**Factor VIII, Basic Human Needs.** Factor VIII is labeled Basic Human Needs (Duffy, 2009). According to Maslow (1971), basic human needs include air, food, fluids, elimination, sleep, and rest. However, Duffy (2009) claims that when a patient becomes ill, “higher-order needs such as social and self-esteem frequently require support” (p. 71). Factor VIII contains three items (item 13, item 22, and item 31). Two of the three items (item 13 and item 31) were found to be correlated at the 0.01 level with the variables: age, gender, depression, and adherence. Item 13, “Help me feel less worried,” had negative association for younger females and depression ($r = -0.56, p=0.01$). Anecdotal observation revealed that the nurse offered greetings when the participant entered the Phase II cardiac rehabilitation session and periodically throughout the session the nurse offered assistance to the participant. If a participant declined the nurse’s offer of assistance, the nurse would say, “Let me know if you need anything,” then would allow the participant to continue to exercise. Thus, the therapeutic nurse caring
relationship allowed the nurse an opportunity to address worries whether the participant indicated a need verbally or non-verbally.

Item 31, “Help me with my special routine needs for sleep,” was found to have a negative significant correlation between older males and adherence ($r = -0.46$, $p=0.01$). Anecdotal observations revealed that the nurses talked to each patient one-on-one at the beginning of their Phase II cardiac rehabilitation (CR) session on the importance of rest and sleep. In addition, it was observed that the nurses gave “permission” to patients to take a 20-minute nap when they returned home. Family members were also encouraged to take a short nap to preserve their own health. During the following exercise session, the nurse checked on the patient’s progress with sleeping at night, and if problems were not resolved with general sleep hygiene suggestions, then a referral to the physician was discussed with the patient and significant other.

Item 22, “Make sure I get the food I need,” was not found to be significantly correlated to any of the variables. Anecdotal observations revealed that participants had access to water, juice, saltine crackers, and graham crackers. And the nurses orientated the participants to the refrigerator and bottled spring water during their first Phase II CR session. Additionally, nutritional classes were held every month with the nutritionist within the same building as the Phase II CR program. Perhaps participants were thinking of full meals when answering this question instead of the snacks that were available in the Phase II CR program. It is also plausible that the Phase II CR participant had eaten at home and did not think about the snacks at the exercise facility. Thus, qualitative comments would be beneficial to clarify this variation between anecdotal observation and participants’ perceptions.
Conclusion of Findings

The following are the major findings from the 109 Phase II cardiac rehabilitation (CR) participants’ responses:

1. The Caring Assessment Tool-IV (CAT-IV) is a reliable theoretically-based measurement of the concept, nurse caring.
2. Administration of the CAT-IV is feasible for outpatient Phase II CR participants.
3. There was a statistically significant inverse relationship between participants’ perception of nurse caring and depression in Phase II CR participants.
4. There was a statistically significant inverse relationship between participants’ perception of nurse caring and anxiety in Phase II CR participants.
5. There was a non-significant positive relationship between participants’ perception of nurse caring and adherence to the Phase II CR program.
6. There was a strong statistically significant positive relationship between depression and anxiety for Phase II CR participants.
7. There was a small statistically significant inverse relationship between depression and adherence to the Phase II CR program.
8. Seven of eight nurse caring factors, which comprise the CAT-IV, suggested nurse caring influenced the relationship between the nurse and participants in the Phase II CR program.

Implications for Nursing

This study adds to the growing nurse caring science by evaluating the CAT-IV in an outpatient setting and correlations between nurse caring and the variables: depression, anxiety,
and adherence. The following discussions for nursing practice, administers, nurse educators, nurse researchers, and those who influence health care policy originate from this study’s results and anecdotal observations of the nurse researcher.

**Nursing Practice**

Even before Fumeron et al. (2002) found that the long allele associated with depression on the serotonin transporter gene (5-TTLPR) was the same long allele associated with a myocardial infarction, scientist have been trying to decide the best method to treat the comorbidities, cardiovascular disease and depression. Milani et al. (1996) and McCann et al. (2005) revealed that patients with cardiovascular disease and depression had reduced physical fitness and high amounts of depressive symptoms when starting a Phase II cardiac rehabilitation (CR) program. Both studies found the physical endurance and depression improved when the patients participated in a Phase II CR program. Thus far, the exact reason for improved exercise capacity and depressive symptoms accomplished during the Phase II CR program remains elusive. The first research hypothesis for this study looked at the association between depression and the participants’ perceptions of nurse caring. The findings of this study suggest that the interpersonal relationship between the patient and nurse had a significant inverse association with the participants’ depression. Nursing theorists (Leininger, 1988b; Watson, 1979) have advocated that the interpersonal relationship between the nurse and patient provides therapeutic results, thus the essence of nursing. The correlational findings from this study are similar to previous studies for Phase II CR. Younger women had a higher frequency of depressive symptoms compared to older women (Beckie et al., 2008; Plach et al., 2003).
The item analysis of the 36-items revealed more information on the associations among the variables: nurse caring, age, gender, and depression. Different gender and age cohorts preferred different nurse caring interventions. The results revealed there was an inverse association between younger females and depression for four nurse caring factors (attentive reassurance, human respect, healing environment, and basic human needs). In addition, a singular significant inverse correlation was found for older women and depression for Factor VI, healing environment. These results will help operationalize the concept of nurse caring, which is often thought of as only an art, but the anecdotal observations and correlational findings suggest are evident in the Phase II cardiac rehabilitation (CR) program (Duffy, 1990; Watson, 1979). The direct patient care nurse can use this information to improve patient-nurse relationship quality (Duffy & Brewer, 2011). One Caring Assessment Tool- IV (CAT-IV) item that needs further investigation is, “Encourage my ability to go on with life,” especially if a participant is known to have depression. This is similar to the Joint Commission’s requirement for acute care facility certification when screening is ongoing for depression and suicide precautions.

The second research hypothesis for this study looked for an association between anxiety and the participants’ perceptions of nurse caring. The young males, older males, and older females who attended the Phase II CR program recorded scores on the CAT-IV that suggested as nurse caring increased, anxiety decreased, but participants’ perceptions were different for which intervention was significant based on their age and gender cohort. Older females indicated healing environment was significant for their age and gender. Younger males indicated attentive reassurance was significantly correlated. However, older males indicated affiliation needs were significant for their cohort when analyzing anxiety. Johnston et al. (1999) discovered that
anxiety scores significantly dropped for male cardiac patients (n=100) and their partners (n=72) when a nurse counseled them on cardiac recovery.

The registered nurse can use this information to provide a healing environment where verbal assurance is given for individuals with comorbidities of cardiovascular disease and anxiety and the families who strive to help care for them. Teaching the Borg Scale of Perceived Exertion would benefit a participant with anxiety since then they would feel they have some control over their exercise pace, and how far they can safely extend their exercise intensity. In addition, administrators could use the model developed by Duffy (2009) to better understand the nurses’ roles and how to retain the experienced Phase II cardiac rehabilitation (CR) nurse.

Watson (1979) first proposed that when patient goals are achieved, the nurses feel satisfied with their part in the recovery of the patient and energized to provide services for another patient who desires the nurse’s knowledge and guidance. However, if the relationship between the patient, nurse, and healthcare system becomes toxic, the patient feels helpless and perceives less than quality nurse caring and nurses often begins to hate their jobs (Halldorsdottier, 1999).

Based on the correlational findings from the Caring Assessment Tool- IV (CAT-IV) and anecdotal observations from this study, an administrators could use the framework from the Quality-caring model © to analyze the Phase II CR program mission and address the registered nurses’ roles and responsibilities, resources, and collaborative communication among the team members, patients, and the environment. The CAT-IV could be used by the administrator to develop a job description to attract the right nurse or develop an educational tool to be used in orientation to educate a new nurse to the Phase II CR program on anticipated nurse caring behaviors. The job description would include the nurse caring factors with examples that were
observed during this study (Duffy et al., 2007; Wolf et al., 2003). In addition, the Quality-caring model© could be used to explain the process of interpersonal relationships and how the patient’s perception of nurse caring behaviors impact the patient, nurse, and Phase II CR program outcomes (Watson, 1979). Once this is accomplished, a performance evaluation tool, to validate the performance of nurse caring could be developed to demonstrate competence in such behaviors. Once the evaluations have been completed, administrators could incentivize nurses to perform nurse caring practices, which may include monetary rewards, educational seminar on cardiac yoga, or free annual membership to professional organizations such as the American Association Cardiovascular and Pulmonary Rehabilitation or International Association of Human Caring.

Nursing Education

Beck’s (2001) metasynthesis of 14 qualitative studies documented that when nursing students experienced caring within the educational environment; that caring was transferred to the patient care settings by the student nurse. Although not documented in this study’s demographic data about the two nurses in this Phase II CR program, it is assumed the nurses learned some or most of their nurse caring skills while in their basic nursing education program, but this is a variable that was not collected.

Over the past decade, nurse educators have been challenged to incorporate successful nurse caring experiences in an already crowded nursing curriculum. Both accrediting agencies for nursing education programs require summative evaluations of nursing students. In theory, the goal is for nursing students to learn the knowledge and skills used by the professional nurses in caring relationships so the patient feels ‘cared-for,’ in a safe environment (Duffy & Hoskins,
2003, p. 83). The ideal nurse caring educational session helps the student recognize value in providing a therapeutic relationship in the clinical setting. Duffy transformed the Quality-caring model® into the Quality-Caring Model for Educational Program Evaluation© tool that retained the structure, process, and outcome sections from the original model, but the dynamic updated model diagrams specifically identifies participants and their characteristics that contribute to quality outcomes, and collaborative relationships that can be used by nurse educators (Duffy, 2004, p. 67).

Currently, effective nurse educators use multiple methods of teaching. These methods include assignments from traditional nursing books in combination with reliable Internet resources such as articles from the International Journal of Human Caring. It is also possible that nurse educators would illustrate and discuss nurse caring behaviors in simulation laboratories or role-play scenarios during a portion of lectured classes, which may stimulate the nursing students to critically think about nurse caring behaviors as they attempt to facilitate nursing interventions and help patients achieve individualized goals.

A simulation laboratory scenario could be developed for any of the nurse caring factors. An example of a simulation on the nurse caring factor, human respect, would require a faculty member and three nursing student in the role-playing scenario. The nursing class would have a short reading assignment on human respect completed prior to coming to the simulation laboratory. On the day of the simulation, one student would be in the role of the patient and another student would be the nurse, who respectfully listens to the patient explain why they are coming to the Phase II cardiac rehabilitation program. Intermittent comments from the student role-playing the family member would provide cues to help the student-nurse use the correct
nurse caring interventions. The rest of the students in the class would be in another room, where through video streaming they could observe the nurse-patient relationship. After the scenario is completed, the whole group of students would debrief and be asked to share their thoughts and suggestions for improvement. Additional discussion on cultural differences, and holding another person’s hand in times of distress could also be discussed during the debriefing. The class would then take another three volunteers and experience scenarios where patients have cardiac problems and depression or anxiety. This type of scenario would help beginning nurses identify specific symptoms and try new nurse caring interventions. With practice the nurse caring factors could be mastered the same as mastering procedural techniques such as inserting a nasal gastric tube. Multiple practice sessions would reinforce the importance of nurse caring not only for mental health crisis, but for its value when used in everyday nursing practice.

After reading nursing textbooks and participating in simulation laboratories, the next step would be to expose students to clinical experiences and later to take a few minutes to journal their progress. This reflective journaling has been found to promote the nurse’s clinical awareness and critical thinking while contemplating their own nurse caring interpersonal skills during direct patient care (Hendrix, O’Malley, Sullivan, & Carmon, 2012).

A pre and post research study to examine the use of textbook readings, simulation, clinical exposure, and journaling on nursing student’s effective implementation of nurse caring behaviors with a patient, would be of interest to nursing faculty and administrators. Duffy has modified the Caring Assessment Tool-IV (CAT-IV) for nursing education and named it the CAT-Edu that can be used to evaluate the nursing students’ perception of faculty caring behaviors. A longitudinal research study that combines the CAT-IV and the CAT-Edu, where
the nursing student perception of nursing educators and patients’ perceptions of nursing students are assessed, would be of interest to nurse faculty since a goal of nursing education is to provide safe, quality patient care by nursing students who grow into skilled nurses. In addition, nurse educators are in excellent positions to negotiate with acute care and outpatient facilities to do nurse caring research that would examine how much a student nurse retained immediately after a simulation, after completing their first year of being a registered nurse, and five years after their basic nursing graduation if they had not gone on for further nursing education.

The North American Nursing Diagnosis Association (NANDA) list promotes safe patient care by standardizing evidence based nursing diagnosis (NANDA, 2013). Video recordings connecting nurse caring behaviors with the NANDA list could be instrumental in illustrating culturally sensitive and evidence based nursing practice. The current healthcare system is fast paced and nursing students can rarely gain enough experience to be competent novice nurses by attending clinicals or skills laboratory, only. In addition, the potential for error increases with each new disease management appliance seen by a nursing student since the student reports getting anxious (O. Sar, personal communication, January, 2012). “Build on the experiences of others” is recommended by Duffy as a redesigning strategy (Duffy, 2009, p. 210). A study by the psychology group of Kirby, Williams, Hocking, Lane, and Williams (2006) found that commercially prepared training products improved skills in a group of healthy volunteers (n=196) with and without a facilitator. The study looked at anxiety, depression, and perceived stress. Repeated-measures analyses of variance was completed at the 10th day that revealed anxiety (p=0.0004) and perceived stress (p=0.034) decreased, but not depression decreased. At six months only anxiety scores for participants in the workshop and commercially prepared
video remained significant ($p=0.0148$). Though not yet available for nursing students, commercially prepared videos and faculty lead sessions in a simulation laboratory or classroom would be of benefit for nursing students in an attempt to decrease their anxiety, as well as enhance safe, quality, cost-effective patient care. To promote critical analyses, exemplary nurse caring video scenarios, coupled with nursing diagnoses, could be streamed to the lecture hall prior to having students enter their designated clinical site.

**Nursing Research**

Findings from this study suggest continued research is needed on the concept of nurse caring. Mixed method studies need to be done so the richness of the qualitative data is retained while quantitative data is gathered for policy makers to use in planning. Duffy (2009) identified eight factors of nurse caring, six of which were evident in this study. Factor I, Mutual Problem solving, and Factor V, Appreciation of unique meanings, were not found statistically significant at the 0.01 level (2-tailed). Research that examines how nurses help clients develop solutions through learning new ideas, how culturally sensitive nurse caring is provided, and the impact the nurse caring interventions effect the participants and their families would be a topic for future research. The same concepts may have very different meanings for individuals from different cultures or may be delivered differently by nurses from different cultures.

In this study, associations between variables (depression, anxiety, adherence, and participants’ perception of nurse caring) were examined in the outpatient setting called Phase II cardiac rehabilitation. More research studies on the six nurse caring factors are needed to document similarities and differences from a variety of settings and sites in the outpatient services departments and community centers. Additional demographics about the participants,
nurses, and the facility would be beneficial to test the Quality-caring model© and make better decisions about participants’ outcomes or if all participants are the same no matter what their cultural beliefs. Additional research questions include: Do nurses from bachelor degree programs provide more nurse caring than associate degree nurses? Which medical diagnoses or comorbidities are the hardest for the nurses’ to provide nurse caring? The answers to these questions may change nursing education and nursing practices in the clinical setting.

Relating nurse caring behaviors to long term outcomes would also be of interest to healthcare providers, researchers, and administrators. Topics of interest include: If a participant learned to exercise in the Phase II cardiac rehabilitation (CR) program, were they able to continue to exercise on their own without the nurse or group support? If a cardiac participant with a comorbidity of anxiety found that exercise was effective in the Phase II CR program, were they able to continue to exercise independently or did they need to belong to a group to continue to maintain their healthy lifestyle? If the participant found exercising in an extended CR program successful, how long did they need to stay in the extended exercise program before becoming independent? Long-term outcome measures such as the 6-minute walk test, depression, anxiety, or nutritional intake could also be examined with the CAT-IV to determine if one or multiple methods of nurse caring behaviors were needed to successfully communicate with participants.

Another research topic for nurses would be to capture nurse caring behaviors in the Phase II CR setting by the use of computer documentation. Information technologists report the development of cloud computing that provides improved data speed, security, resiliency, privacy, backup of mobile applications, and adaptability (Harris, 2012). If the information
system is able to document nursing caring services that were provided, then decisions can be made on the quality of interventions and nurse caring’s impact on patient outcomes, and at the same time investigate a variety of variables. The system can then use the information for quality improvement purposes and reimbursement of services (Lyden, 2008).

**Nursing Policy**

In 2012, the United States Supreme Court upheld the Patient Protection and Affordable Care Act (PPACA) as constitutional. The aim of PPACA (Patient, 2010) is to reduce the number of uninsured Americans, decrease the overall cost of healthcare, and target prevention. Patient access to healthcare is anticipated to decrease anxiety and fear of losing their home due to medical payments that bankrupt the patient receiving treatments (Himmelstein, Warren, Thorne, & Woolhandler, 2005). Even though the United States has just begun to implement PPACA, a 6% drop in adult deaths in three states has been documented due to the expanded coverage for residents (Sommers, Baicker, & Epstein, 2012).

Nurse caring interventions that start with direct patient care and go to the board level (Hassmiller & Combes, 2012) will be instrumental in making the changes necessary for the 32 million Americans expecting quality-driven, cost-effective, culturally appropriate, and holistic patient and family-centered healthcare (Haney, 2010). There is a provision within the PPACA for nurse managed clinics. As seen in this study, Phase II cardiac rehabilitation (CR) participants’ perceptions of nurse caring was high and outcomes of depression and anxiety were good as expressed by the participants’ self-scoring on the tools. Phase II CR could be one site for master’s degree nurse, nurse practitioner or clinical nurse specialist, to collaborate with other interdisciplinary team members to integrate services for a variety of patients that would benefit
from the healthy lifestyle habits; those who already have diseases and for those who wish for preventive services. In addition, the availability of an onsite certified mental health nurse that was introduced to patients on entry to the program could be added. The patient would self-select when or if further counseling is desired. This healthcare provider would also be able to provide stress management, Tia chi, and cardiac yoga classes. Providing onsite access to a nutritionist for diabetics, kidney failure, and other participants with multiple medical conditions would allow participants an opportunity to take advantage of the services.

In this study, Duffy’s *Quality-caring model*© (Duffy & Hoskins, 2003) helped guide nursing research in the Phase II cardiac rehabilitation (CR) program. In combination with a self-governance model that incorporated the state nurse practice act, American Nurses Association scope and standards of nursing practice, American Nurses Association (ANA) Code of Ethics, ANA Bill of Rights for Nurse, ANA Principles of Delegation, ANA Principles of Documentation, ANA Principles of Staffing, ANA Nursing’s Social Policy Statement, The *Quality-caring model*© could be used to provide clarity with structure, process, and outcomes in nursing practice (Donabedian, 1992; Duffy & Hoskins, 2003). Phase II CR employees would receive educational sessions on nurse caring behaviors, Phase II CR outcomes, and how the *Quality-caring model*© promoted professionalism. In alignment with Duffy’s model, the self-governance model allows the team members with respect and encourages leadership as insights are shared, which is needed to develop efficient and effective processes to accomplish an affordable high-quality, safe, and culturally sensitive Phase II CR program (Drucker, 2008; Lowell, 2013).
Recommendations

As a result of the findings of this study, the relationship between participants’ perception of nurse caring, depression, anxiety, and adherence in the Phase II cardiac rehabilitation program, the following recommendations are presented for clinical nursing research studies to further examine and validate the findings of this study to include:

a) instead of anecdotal observations documenting the nurse caring behaviors, a valid and reliable tool be developed and used to document observations;

b) longitudinal experimental studies to identify changes in the relationship between participants’ perception of nurse caring and depression, anxiety, and adherence at specific time intervals such as admission to the Phase II cardiac rehabilitation (CR) program, midway point, and during the last exercise session;

c) longitudinal experimental study to include family’s perception of the CAT-IV, depression, and anxiety on admission of the patient, at a mid-way point in Phase II CR, and during the last exercise session;

d) a mixed methods study in which qualitative data would provide understanding of participants’ interpretations of questions and responses;

e) multiple regression with initial demographic data to include: income level, Medicare or Medicaid or health insurance with details of how much the co-pay was for each participant, 6-minute walk test, blood pressure and heart rhythm, the name of the comorbidities instead of number of comorbidities, adherence, gender, and age;

f) experimental study to include individuals who dropped out to identify their perception of nurse caring, and their level of depression and anxiety;
g) purposefully include more women Phase II cardiac rehabilitation (CR) participants;

h) pre-test participants in a Phase II CR program with the CAT-IV before the Phase II CR program adapted the *Quality-caring model*© then do a post-test of a group of participant’s perception of nurse caring to see if the patients’ perceptions have changed or depression, anxiety, or adherence has improved;

i) video tape interactions between the Phase II CR nurse and a participant during an intake session to document current nurse caring practices; educate the Phase II CR nurse on the *Quality caring model*© and the eight Factors that comprise the CAT-IV; then re-tape a session with a patient to see if the nursing caring educational intervention was effective;

j) combine research of the CAT-IV and the CAT-Edu at clinical sites and schools of nursing as nursing students being introduced to nurse caring behaviors: that is evaluated at the beginning of nursing classes, after one year of nursing classes, at graduation, and then after one-year of working in the field as a registered nurse.

A common statement among novice researchers is that research findings bring more questions. This correlational dissertation provided statistics plus anecdotal observations from behind the scenes in a Phase II CR program, which were intended to encourage contemplation by nursing professionals. The current question remains: If this is where we are, how do we provide better nurse caring relationships for our future patients? This most likely will require well educated nurses to provide quality, safe nurse caring practices with specific interpersonal skills to help patients achieve their goals. This study’s results indicate that the participants’ perception of nurse caring in the Phase II CR program was evident, and may provide a model for other Phase II CR sites or outpatient settings.
Appendix A

Center for Epidemiological Studies-Depression (CES-D)
Below is a list of some of the ways you might have felt or behaved. Please indicate how often you have felt this way during the past week. Select one answer for each line.

<table>
<thead>
<tr>
<th>During the Past Week</th>
<th>Rarely or None</th>
<th>Some</th>
<th>Occasionally</th>
<th>Most of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Less than 1 day)</td>
<td>(1-2 days)</td>
<td>(3-4 days)</td>
<td>(5-7 days)</td>
</tr>
<tr>
<td>1 I was bothered by things that usually don't bother me.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2 I did not feel like eating; my appetite was poor.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3 I felt that I could not shake off the blues even with help from my family or friends.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4 I felt I was just as good as other people.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5 I had trouble keeping my mind on what I was doing.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6 I felt depressed.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7 I felt that everything I did was an effort.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8 I felt hopeful about the future.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9 I thought my life had been a failure.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>10</td>
<td>I felt fearful.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>My sleep was restless.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>I was happy.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>I talked less than usual.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>I felt lonely.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>People were unfriendly.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>I enjoyed life.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>I had crying spells.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>I felt sad.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>I felt that people dislike me.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>I could not get &quot;going.&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Appendix B

State-Trait Anxiety Inventory-Y-1 (STAI-Y-1)
DIRECTIONS:
A number of statements, which people have used to describe themselves, are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel right now; that is at this moment. There is no right or wrong answers. Do not spend too much time on any one statement, but give the answer which seems to describe your present feelings best.

<table>
<thead>
<tr>
<th></th>
<th>NOT AT ALL</th>
<th>SOMEWHAT</th>
<th>MODERATELY SO</th>
<th>VERY MUCH SO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel calm</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I feel secure</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I am tense</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I feel at ease</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I am jittery</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. I feel indecisive</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. I am relaxed</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I am worried</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Eight items allowed by Author
Appendix C

Phase II Cardiac Rehabilitation Participant Data Sheet
Phase II CR Participant’s Data Sheet

**Diagnosis:**
1) Stable Angina  
2) MI (medical management only)  
3) CABG (no MI)  
4) Stent (no MI)  
5) Pacemaker/ICD  
6) MI with Stent  
7) Heart Failure  
8) MI with CABG  
9) Atrial Fibrillation  
10) Hypertension  
11) Hyperlipidemia  
12) Peripheral Vascular Disease  
13) Coronary Artery Disease  
14) Cardiomyopathy  
15) Valvular Regurgitation (mitral or aortic)  
16) Valvular Repair (mitral or aortic)  
17) Heart Transplant  
18) Other: Specify____________________________________

**Age:** _____ Years  
**Gender:** _____ (0) Male  
_____ (1) Female

**Comorbidities:** Total Number: _____

Total number of sessions authorized by third party reimbursement: _____

Total number of sessions attended when patient stopped Phase II CR program: _____

Percentage of sessions attended: ________

CES-D Score: ________

STAI-Y-1 Score: ________

CAT (IV) Score: ________

___Obtain phone number from Phase II CR records

___Obtain mailing address from Phase II CR records
Appendix D

Caring Assessment Tool-Version IV (CAT-IV)
Directions: All of the statements in this survey refer to nursing activities that occur in a health care situation. There are five possible responses to each item. For each statement, please circle how often you think each activity is occurring during your health care.

Since I have been a patient here, the nurse/s:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Frequently</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Listen to me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Help me to believe in myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Treat me kindly</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Encourage me to ask questions</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Pay attention to me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Are available to me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Check up on me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Make me feel as comfortable as possible</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>Accept me as I am</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>Support me with my beliefs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>Pay attention to me when I am talking</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>Help me see some good aspects of my situation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>Help me feel less worried</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14</td>
<td>Anticipate my needs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Never</td>
<td>Rarely</td>
<td>Occasionally</td>
<td>Frequently</td>
<td>Always</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------------------------------</td>
<td>-------</td>
<td>--------</td>
<td>--------------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>15</td>
<td>Allow me to choose the best time to talk about my concerns</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>Are concerned with how I view things</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17</td>
<td>Seem interested in me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18</td>
<td>Respect me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>Are responsive to my family</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
<td>Acknowledge my inner feelings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>Help me understand how I am thinking about my illness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22</td>
<td>Make sure I get the food I need</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23</td>
<td>Help me explore alternative ways of dealing with my health problem/s</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24</td>
<td>Ask me what I know about illness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25</td>
<td>Help me to figure out questions to ask other health care professionals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26</td>
<td>Support my sense of hope</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27</td>
<td>Respect my need for privacy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Never</td>
<td>Rarely</td>
<td>Occasionally</td>
<td>Frequently</td>
<td>Always</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------</td>
<td>-------</td>
<td>--------</td>
<td>--------------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>28</td>
<td>Allow my family to be involved as often as I need</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>29</td>
<td>Ask me how I think my health care treatment is going</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>30</td>
<td>Treat my body carefully</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>31</td>
<td>Help me with my special routine needs for sleep</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>32</td>
<td>Encourage my ability to go on with life</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>33</td>
<td>Help me deal with my bad feelings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>34</td>
<td>Know what is important to me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>35</td>
<td>Talk openly to my family</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>36</td>
<td>Show respect for those things that have meaning to me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

THIS IS THE END OF THE SURVEY. THANK YOU FOR YOUR VALUABLE TIME.

©Joanne R. Duffy PhD, RN, FAAN (2007)
Appendix E

Script for Phase II Cardiac Rehabilitation Staff at Orientation
**Script for Phase II CR Staff Orientation**

The Phase II CR nurse may want to use these or similar words when asking all the Phase II CR patients if they want to participate in the study:

- (Patient name), Jo Ann Kim is a nursing student working on her doctoral degree in nursing. She is doing a research project here. She wants to learn more about how you perceive nurse caring here in our Phase II CR program.

- Jo Ann Kim is wondering if she could discuss this study with you. She asked me to tell you that speaking with her is optional, your answers are kept confidential, and will not affect the care you receive here is the Phase II CR program. May I give her your name, so she may contact you to give you more information? (Patient’s Response)

* Please note: The data collected is the “patient’s perception” and may not be the actual nurse caring provided by the Phase II cardiac rehabilitation nurse.

Contact Information:

Jo Ann Kim, RN, ACNS-BC

Best Phone Number: 301-262-0208

Cell Phone Number: 240-460-1891

12416 Melling Lane

Bowie, MD 20715
Appendix F

Informed Consent
INFORMED CONSENT FORM

Name of Study: The Relationship between the Perception of Nurse Caring, and Phase II Cardiac Rehabilitation Patients’ Depression, Anxiety, and Adherence

Investigator: Jo Ann Kim, RN, ACNS-BC
Doctoral Candidate
Telephone: (301) 262-0208

Supervisor: Jean Toth, Ph D, RN, BCCC
The Catholic University of America
Telephone: (202) 319-6555

Questions: Jo Ann Kim, RN, ACNS-BC
Telephone: (301) 262-0208
E-mail: 27kim@cardinalmail.cua.edu

I. Description and Purpose of the Study

I, _______________________________ understand that this is a research study that follows strict rules due to fulfilling a requirement of the investigator’s Ph. D. program. The Catholic University of America’s Institutional Review Board has approved this study. Your hospital’s review board has also approved this study. I understand that I am a volunteer. I understand this study will ask every participant in the Phase II cardiac rehabilitation program their view of nurse caring, depression, anxiety, and attending the Phase II cardiac rehabilitation program that provides group exercise and individualized health teaching by appointment.

II. Description of the Procedures

I have agreed to talk with the investigator. The investigator has discussed the study and reviewed the informed consent with me. I understand that every person who
attends the Phase II cardiac rehabilitation program will be asked to participate. I understand the investigator will review of my health records after I have completed or leave the Phase II cardiac rehabilitation program. I agree for the investigator to know such things as my diagnoses and age. I also understand she will look at how many of the planned visits I attended. This study will start when I sign this consent form. The study will end when I have stopped attending the Phase II cardiac rehabilitation program. Filling out the three (3) forms will happen one time, which may take me about 30 minutes. The investigator will be here to answer any questions I have about the study.

I understand this study aims to look at nurse caring. Inpatient cardiac patients identified that respect, hope, trust, and sensitivity of the nurse helped create a beneficial bond, which helped the patient reach their health related goals. This study looks at outpatients. I understand by answering the questions on the Caring Assessment Tool (IV) that I will contribute to finding out if nurse caring is found in the Phase II cardiac rehabilitation program.

I understand that I can return the forms right after filling them out. On the other hand, I may return them by mail if I want to take them home. If I choose to take the forms home, the investigator will give me a stamped, addressed envelope so the three (3) forms can be returned to the investigator’s address. The investigator’s address will be used as the return address, so that my name will not appear on the envelop. I understand not to add my name on any of the forms or envelop to help protect my privacy. I may call the nurse investigator to talk about the questions. I understand if I do not mail the forms to the investigator in seven (7) days, the investigator will call me. I give permission for the investigator to obtain my telephone number from my cardiac rehabilitation file.

III. Risks, Inconveniences, Discomforts

I understand that there are no expected risks to this study. However, if I have concerns the investigator is available to talk with me prior to completing the forms. I understand the investigator may choose to stop my participation if I become upset such as crying or anxious while I am answering the questions. I understand that the investigator will talk to the nurse in the Phase II cardiac rehabilitation program if my scores on any of the forms are high, or if I seem distressed, depressed, or anxious as I fill out the forms, but the investigator will not discuss specific answers on any of the forms. The Phase II cardiac rehabilitation nurse will then discuss with me the next step to help me recover. I understand the nurse will follow the Phase II cardiac rehabilitation protocol, which may include an emergency room visit.

IV. Benefits

There is no direct benefit to me for being in the study. However, my answers may be helpful for patients like me in the future. I have an option of accepting a $10 food
coupon for my participation. If I mail the completed forms, the $10 food coupon will be left in a sealed envelop with my name on it at the Phase II cardiac rehabilitation program.

V. Confidentiality of Research Records

I understand there will be a code used instead of my name on each form and the outside of an envelop to keep my answers confidential. I understand the investigator will keep a list of names and codes until the end of her study. I also understand that the investigator will use a password to protect the information from this study as she works on the computer. She will keep the papers containing my answers in a locked cabinet away from the cardiac rehabilitation program. I understand my name, code, and answers will be destroyed at the end of the study.

VI. Rights of the Subject

I understand I do not have to be in this research study. I can agree to be in the study now and change my mind later. I also understand that my decision, either way, will not change my Phase II cardiac rehabilitation program.

I understand at the end of the study that I may have a copy of the results, if I ask for it.

I understand that any information about me will be as confidential as legally possible.

I understand that the research forms, just like hospital records, may be looked at by federal authorities or be required to be taken to a court.

I have had a chance to ask questions about the research and my part in it. I am satisfied with the answers to my questions.

I understand that I will receive a copy of this signed consent form.

I volunteer to take part in this study.

_________________________________  __________________________________
Participant’s signature  Investigator’s signature

_________________________________  __________________________________
Date  Date

Any complaints or comment about your participation in this research project should be directed to the Secretary, Committee for the Protection of Human Subjects, Office of Sponsored Programs and Research Services, The Catholic University of America, Washington, DC 20064; Telephone: (202) 319-5218.
Appendix G

Advertisement
Phase II Cardiac Rehabilitation
Patients
Requested to Take Part
in a Nursing Research Study

Please help us learn what you perceive
as important to your recovery.

Please talk to the study nurse
Jo Ann Kim, RN, Ph. D (candidate)
301-xxx-xxxx or 27kim@cardinalmail.cua.edu
References


Annapolis, MD: Author.


Bennett, K., Kabir, Z., Unal, B., Shelley, E., Critchley, J., Perry, I.,...Copewell, S.  
(2006). Explaining the recent decrease in coronary heart disease mortality rates 
322-327.  doi: 10.1136/jech.2005.038638

between vulnerability and dignity.  *International Journal for Human Caring, 

Retrieved from http://www.biblegateway.com

Bittner, N. P. (2001).  An exploration of critical thinking and processing in cardiac 
nurses’ practice.  (Doctoral Dissertation).  Retrieved from Dissertation & Theses: 
Full text database.  (Publication No.  AAT 3039073).

Effects of holistic cardiac rehabilitation on anxiety and depression: Gender 
difference.  [Poster].  *Journal of Cardiopulmonary Rehabilitation and Prevention, 
27*(5), 325.  doi: 10.1097/01.HCR.0000291324.70311.eb

Blanco-Colio, L. M., Martin-Ventura, J. L., Vivanco, F., Michel, J., Meilhac, O., & 
Egido, J. (2006).  Biology of atherosclerotic plaques: What we are learning from 
1016/j.cardiores.2006.05.017


doi:10.1002/14651858.CD001800


N Y: National League for Nursing Press.


Rosamond, W., Flegal, K., Furie, K., Go, A., Greenlund, K., Haase, N.,…Hong, Y.  
doi:10.1016/CIRCULATIONAHA.107.187998


LETTERS OF PERMISSION
Dear JoAnn:

Thank you for your inquiry to the National Institute of Mental Health (NIMH), part of the National Institutes of Health (NIH).

Per our phone conversation, we are sending the Center for Epidemiologic Studies Depression (CES-D) Scale as an attachment to this e-mail. This scale is in the public domain and can be copied, revised, or reproduced as needed. Citation of the NIMH as the source is appreciated.

If you need information about scoring and interpretation of data, we suggest you search the literature through PubMed, the National Library of Medicine's searchable database of 15 million scientific research abstracts and citations at: http://www.ncbi.nlm.nih.gov/pubmed.

We hope this information is helpful. The NIMH conducts and supports medical research to improve people's mental health. We provide a wide range of information based on that research. If you have additional questions, please contact us again.

Information Center
National Institute of Mental Health
E-mail: nimhinfo@nih.gov

Department of Health and Human Services
National Institutes of Health

SENSITIVE/CONFIDENTIAL INFORMATION
The information contained in this e-mail is confidential. It is intended only for the addressee(s) identified above. If you are not the addressee(s), or an employee or agent of the addressee(s), please note that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this e-mail in error, please notify the sender of the error and then destroy the document. Thank you.

(Attachments successfully scanned for viruses.)

Attachment 1: (application/word)

October 8, 2008
Jo Ann Kim, MSM, ACNS-BC
12416 Melling Lane
Bowie, MD 20715

Dear Ms. Kim:

In response to your recent request, I am very pleased to give you permission to reproduce and use the State-Trait Anxiety Inventory (STAI-Form Y) in your dissertation research, entitled:

**The relationship between the patient’s perception of nurse caring and Phase II cardiac Rehabilitation Patients’ anxiety, depression, and adherence.**

It is my understanding that your research will be carried out at:

**Mid-Atlantic States of the US in one or more outpatient (Phase II) Cardiac Rehabilitation programs.**

This permission is contingent on your agreement to share your findings with us when your research is completed. I look forward to receiving further information about your procedures and the results of your study as this information becomes available.

Best wishes on your research project.

Sincerely,

Charles D. Spielberger, Ph.D., ABPP
Distinguished Research Professor of Psychology
Director, Center for Research in Behavioral Medicine and Health Psychology
Phone (813) 974-2342; E-mail: spielber@cas.usf.edu
April 20, 2008

To: Jo Kim RN, MSN

From: Joanne R. Duffy PhD, RN, FAAN

Re: CAT©

You have my permission to use the CAT© (Duffy, Hoskins, & Seifert, 2007) for your dissertation research to include the specified number of subjects. I would appreciate knowing of your findings since this relates to my own research. Good Luck.
Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that Jo Ann Kim successfully completed the NIH Web-based training course “Protecting Human Research Participants”.

Date of completion: 11/05/2009

Certification Number: 334040