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Illness Perception, Depression, Anxiety and Quality of Life in Older Adults Post Coronary Heart Disease Event

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Illness Perception, Depression, Anxiety and Quality of Life in Older Adults Post Coronary Heart Disease Event

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DEDICATION

I would like to dedicate my dissertation to my wife Armita and my son Nathan without whom this dissertation would not have been completed. I would not have completed this journey and many years of my schooling without my wife’s unconditional understanding, patience, help, and support. My wife Armita, who is listening to all of my complaints and problems when I am discouraged and feel exhausted at the end of a difficult day, and re-assure me that we I will be fine with smile and hug. I dedicate this dissertation to my wife who has been a constant source of support and encouragement during the challenges of graduate school and life and encourage me to work hard and look forward to want I determine to achieve. I also dedicate this dissertation to my loving son, who came to my life as I started my PhD program. Nathan who is the best part of my life and his present motivate and inspire me to work harder and be a stronger person. I am truly lucky, bless, and thankful for having my wife and my son in my life.

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ABSTRACT

Illness Perception, Depression, Anxiety and Quality of Life in Older Adults Post Coronary Heart Disease Event

Mahmood Khosravi

America is aging. Adults, 65 years and older, comprise nearly 13% of the population. Coronary heart disease (CHD) is the leading cause of mortality in adults 65 years and older. As a chronic illness, CHD can lead to decreased health-related quality of life (HRQOL) and increased depression, anxiety and health expenses. Illness perception, the way in which people view illness, has been linked to health outcomes. As people age, illness perceptions and coping strategies to deal with a health threat can change, but there is a paucity of literature about how older adults view illness and how it affects their health outcomes. Within the context of Leventhal's self-regulation theory, the dissertation purpose was threefold: (1) describe and identify gaps in the illness perception literature specific to older adults with CHD, (2) examine the relationship between illness perception, depression, anxiety and HRQOL among older adults who have experienced a CHD event, and (3) describe the illness perceptions of older adults participating in cardiac rehabilitation post-CHD event, taking into consideration sociodemographic characteristics.

The convenience sample of 58 older adults was comprised of 47 men and 11 women recruited from cardiac rehabilitation centers in the San Francisco Bay Area. The predominantly White, non-Hispanic sample ranged in age from 65 to 88 years with a mean age of 74 years. Participants responded to the Hospital Anxiety and Depression Scale, the Illness Perception Questionnaire Revised, and the RAND 36-item Health Survey to measure HRQOL. Health and sociodemographic data were also collected. Despite participants believing their CHD would be chronic, CHD symptoms would fluctuate and occur often, CHD would have negative consequences, and CHD caused distress, they believed CHD could be controlled and treated and understood CHD. Participants were at low risk for anxiety and depression and had above average mental and physical HRQOL. Varying dimensions of illness perception contributed significantly to the variance in depression, anxiety and HRQOL. Statistically significant differences in illness perceptions varied by sociodemographic characteristics. Study findings highlight the importance of cardiac rehabilitation nurses intervening to address older adults' illness perception and its effect on emotional, psychological and physical health and wellbeing.

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INTRODUCTION

Statement of the Problem

America is aging. Adults, 65 years and older, comprise nearly 13% of the United States (US) population (Fang, Yang, Hong, & Loustalot, 2012; Kramarow, Lubitz, Lentzner, & Gorina, 2007). In the US, coronary heart disease (CHD) costs $108.9 billion each year, is the leading cause of mortality, and causes 80% of deaths in adults 65 years and older (Heidenreich et al., 2011; Heron, 2012; Roger et al., 2012). As a chronic illness, CHD can lead to decreased health-related quality of life (HRQOL), increased depression and increased health expenses that could affect one's financial status in retirement (Keib, Reynolds, & Ahijevych, 2010). People with CHD are three times more at risk for depression than those without CHD (Frasure-Smith, & Lesperance, 2008). Older adults with CHD have a 25% chance of developing post-CHD depression and are four times more likely to die as compared to non-depressed counterparts (Romanelli, Fauerbach, Bush, & Ziegelstein, 2002). Depression and anxiety have been shown to have negative effects on persons with CHD. Depression has been associated with poorer prognosis, lower HRQOL, greater difficulty with treatment and medication adherence, and greater mortality (Steca et al., 2013). Anxiety has been associated with more CHD symptoms, lower HRQOL and increased hospital readmissions within 6 months of CHD event (Gallagher & McKinley, 2009).

Illness perception, the way in which people view their illness, has been linked to health outcomes. A positive illness perception may be an important protective factor in improving well-being, health outcomes and a successful recovery after a CHD event (Keib et al., 2010). As people age, illness perceptions and coping strategies to deal with a health threat can change based on prior experiences (Leventhal et al., 1992). The literature indicates illness perception is important in understanding how adults respond to and recover from an illness or a health threat, but there is a paucity of literature about how older adults, 65 years and older, in the US view an illness or a health threat and how it affects their health outcomes (Keib et al., 2010). A majority of the illness perception studies of people with CHD have been conducted in countries outside the US with populations younger than 65 years old, and often illness perceptions have not been assessed immediately after a CHD event has occurred. Given that CHD is the leading cause of death in the US and its prevalence increases with age, understanding the illness perceptions of older adults with CHD and how illness perceptions affect their health outcomes may provide insight to designing age-specific secondary prevention interventions to promote cardiovascular health in older adults.

Purpose of the Study

The purpose of the dissertation study was threefold: (a) conduct a literature review in order to describe and identify gaps in the literature related to illness perception and its impact on older adults who have CHD; (b) guided by Leventhal's self-regulation theory, examine the relationship between illness perception, depression, anxiety and HRQOL among older adults who have experienced a CHD event; and (c) describe the illness perceptions of older adults participating in cardiac rehabilitation post-CHD event, taking into consideration sociodemographic characteristics.

Organization of the Dissertation Chapters

Chapter II is a description of the literature related to illness perception and its impact on post-CHD depression in the elderly. In Chapter III, illness perception, depression, anxiety and HRQOL in older adults post-CHD event are described in a sample of 58 older adults (47 men and 11 women), 65 years and older, recruited from two cardiac rehabilitation centers in the San Francisco Bay Area. Guided by Leventhal's self-regulation theory, the influence of age and illness perception on depression, anxiety and HRQOL were also examined. Presented in Chapter IV is a description of eights aspects of illness perception and how perceptions varied among the sociodemographic characteristics of older adults post-CHD who were participating in a cardiac rehabilitation program. In Chapter V, a summary of the dissertation research findings, conclusions, limitations, implications for health and nursing, and recommendations for further research on illness perceptions among the older adult population post-CHD are discussed. Following Chapter V are appendices that include the research instruments and approval by the University of California, San Francisco Institutional Review Board to conduct the study.

References

Fang, J., Yang, Q., Hong, Y., & Loustalot, F. (2012). Status of cardiovascular health among adult Americans in the 50 states and the District of Columbia, 2009. *Journal of American Heart Association*. 1:e005371 doi: 10.1161/JAHA.112.005371

Frasure-Smith, N., & Lesperance, F. (2008). Depression and anxiety as predictors of 2-year cardiac events in patients with stable coronary artery disease. *Archives of General Psychiatry*, 65, 62-71. doi:10.1001/archgenpsychiatry.2007.4

Gallagher, R., & Mckinley, S. (2009). Anxiety, depression and perceived control in patients having coronary artery bypass grafts. *Journal of Advanced Nursing*, *65* (11), 2386-2396. doi: 10.1111/j.1365-2648.2009.05101.x

Heidenreich, P. A., Trogdon, J. G., Khavjou, O. A., …, Woo, J. (2011). Forecasting the future of cardiovascular disease in the United States: A policy statement from the American Heart Association. *Circulation*, 123, 933-944. doi: 10.1161/CIR.0b013e31820a55f5

Heron, M. (2012). Deaths: Leading causes for 2008. *National Vital Statistics Reports*, 60 (6). doi: http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_06.pdf

Keib, C. N., Reynolds, N. R., & Ahijevych, K. L. (2010). Poor use of cardiac rehabilitation among older adults: A self-regulatory model for tailored interventions. *Heart & Lung, 39* (6), 504-511. doi: 10.1016/j.hrtlng.2009.11.006

Kramarow, E., Lubitz, J., Lentzner, H., & Gorina, Y. (2007). Trends in the health of older Americans, 1970–2005. *Health Affairs*, 26 (5), 1417-1425.

Leventhal, H., Diefenbach, M., & Leventhal, E. (1992). Illness cognition: Using common-sense to understand treatment adherence and affect cognition interactions. *Cognitive Therapy and Research, 16*, 143-163. doi:10.1007/BF01173486

Roger, V. L., Go, A. S., Lloyd-Jones, D. M., Benjamin, E. J., Berry, J. D.,…Turner, W. B. (2012). Heart disease and stroke statistics—2012 update: A report from the American Heart Association. *Circulation,* 125 (1), e2–e220. doi: 10.1161/CIR.0b013e31823ac046

Romanelli, J., Fauerbach, J. A., Bush, D. E., & Ziegelstein, R.C. (2002). The Significance of Depression in Older Patients After Myocardial Infarction. *Journal of American Geriatrics Society, 50*: 817-822.

Steca, P., Greco, A., Monzani, D., Politi, A., Gestra, R., Ferrari, G.,…Parati, G. (2013). How does illness severity influence depression, health satisfaction and life satisfaction in patients with cardiovascular disease? The mediating role of illness perception and self-efficacy beliefs. *Psychology & Health, 28* (7), 765-783. doi: 10.1080/08870446.2012.759223

CHAPTER II

LITERATURE REVIEW OF ILLNESS PERCEPTION, DEPRESSION, ANXIETY AND HEALTH-RELATED QUALITY OF LIFE IN THE OLDER ADULT POPULATION WITH CORONARY HEART DISEASE

Coronary heart disease (CHD), defined as a group of heart diseases including myocardial infarction (MI) and angina, is a common cause of death in the United States (US), with more than 80% of CHD deaths occurring in adults 65 years and older (Keib, Reynolds, & Ahijevych, 2010). As the baby boomer generation continues to age, the number of elderly who face CHD will continue to rise and require more healthcare attention. In addition to CHD mortality, the elderly face a decrease in quality of life, an increase in number of disabilities, and greater health-related expenses that affect financial status. Depression and anxiety have been shown to have negative effects on CHD-related outcomes, including increased cardiac events, poor prognosis and increased mortality in older adults (Carney et al., 2009; Davidson et al., 2010; Dickens et al., 2008; Frauser-Smith & Lesprance, 2008; Glassman, Bigger, & Gaffney, 2009; Romanelli, Fauerbach, Bush, & Ziegelstein, 2002; Steca et al., 2013). Furthermore, illness perception has been shown to influence how people respond to illness (Stafford, Berk, & Jackson, 2009). A positive illness perception can be protective for illness recovery and improved health outcomes.

As people age, perceptions, adaptation and response to situations, such as a life-altering illness, change (Romanelli et al., 2002). Illness perception refers to the way people view their disease, disease management and health outcomes (Steca et al., 2013). Although researchers tend to include age as a covariate in studies, few research focuses specifically on the elderly population, 65 years and older. There is a need to distinguish between the general population and the elderly population, who has had different life experiences that influence their health and response to illness. The purpose of the review was to examine existing literature related to illness perception and post-CHD depression, anxiety and HRQOL in the elderly, summarizing key findings, making conclusions, and identifying gaps and areas for further research that might inform the development of interventions to reduce the incidence of and ameliorate the harmful effects of post-CHD complications in the elderly.

Literature Review Search Methodology

A database search was conducted for articles related to illness perception and post-CHD depression among the elderly population. The databases included PubMed, CINAHL, PsycINFO, and Web of Science. The total number of articles related to CHD, depression, anxiety, HRQOL and elderly numbered over 200,000. Adding the keyword, illness perception, to the search yielded 31 articles, of which 10 focused specifically on the impact of illness perception on post-CHD depression, anxiety and HRQOL in adults, 65 years and older. See Table 1 for a summary of the studies.

Post Coronary Heart Disease Depression and Illness Perception

Dickens and colleagues (2008) conducted a longitudinal study in the United Kingdom (UK) to examine the association between negative illness perception and post-MI depression among 313 persons with CHDs. The average age was 58 years and 63% of the sample was male. Participants were recruited and monitored for depression at baseline, 6 months and 2 months post-MI. Negative illness perception was associated with post-MI depression. Participants who believed their MI would last for a long period were almost three times more likely to develop post-MI depression. Participants who believed that their MI would be cured were less likely to develop depression. New episodes of depression in the year after the MI were, in part, attributable to negative illness perceptions and occurred as early as 3 days following MI, particularly perceptions that the MI will last a long time and is unlikely to be cured.

Similar to Dickens and colleagues' (2008) UK study, Stafford and colleagues (2009) also examined the relationship between illness perception and post-MI depression over a 9-month period. The study was conducted in Australia and included 229 people who were hospitalized for percutaneous transluminal coronary angioplasty (PTCA), MI, or coronary artery bypass graft surgery (CABG). Participants ranged in age from 38 to 91 years. Results indicated illness perception was associated with post-CHD depression. Participants older than 65 years reported having less perceived personal control over their MI event as compared to younger participants. Illness perception was associated with depression at 3 and 9 months, explaining 9% and 10% of the variance in depression, respectively. Perceptions of more serious consequences and poorer personal control were associated with depression, but were not statistically significant.

Alsen, Brink, Persson, Brandstrom, and Karlson (2010) conducted a longitudinal, cohort study in Sweden to evaluate the association of depression, fatigue and QOL with illness perception in a sample of 204 patients following a MI. The average age was 64 years and include mostly men (71%). Results showed participants' illness perceptions changed over the 4-month period. Changes were primarily centered on personal and treatment control, with participants perceiving MI as more chronic and less controllable over time. Participants who perceived their CHD event as negative were more depressed and reported more fatigue.

All of the previous studies reviewed were conducted outside of the US. In a cross-sectional study, Cherrington, Moser, Lennie, and Kennedy (2004) assessed the effect of illness perception, depression and anxiety in 52 persons post-MI in a hospital in the Midwest. The mean age of the sample was 60.8 years. Illness perception was associated with depression and MI complications. As depression increased, participants had more negative illness perceptions toward their MI and health outcomes. Depression, however, was not associated with post-MI complications.

In a longitudinal, prospective study conducted in the UK, Furze and colleagues (2005) assessed misconceived or maladaptive beliefs about illness and depression, anxiety and physical functioning in a sample of 141 persons with chronic unstable angina. The age range was 41 to 80 years. At baseline, participants who reported more misconceived and maladaptive beliefs about angina had significantly higher depressive symptomatology. Although there was a statistically significant association between misconceived or maladaptive beliefs about angina and depression at baseline, changes in illness beliefs were not significantly associated with changes in depressive symptomatology 1 year after baseline, suggesting that participants' illness beliefs and depressive symptomatology did not change over time.

The aforementioned studies examined illness perception and depression post-CHD event, Juergens and colleagues (2010) examined the influence of participants' pre-surgery illness beliefs and cardiac risk on depression and QOL at baseline and 3 months following CABG surgery due to CHD (primarily MI). The prospective, longitudinal study was conducted Germany. The 56 participants (44 men and 12 women) were 18 to 80 years old with a mean age of 63.6 years. As compared to the baseline assessment, participants reported more depression at the 3-month assessment after CABG surgery. Depression was related to participants' beliefs of chronic illness duration, severity of consequences, and low illness coherence. There was no relationship between age and depression, but there was an association between depression pre- and post-CABG surgery. Pre-CABG depression explained 23% of the variance in post-CABG depression. Illness perception explained an additional 14% of variance in participants' depression at the 3-month follow-up assessment. Thus, participants who had negative illness perceptions toward CHD and pre-CABG depression were more likely to be depressed 3 months after surgery.

Gender differences were not examined in a majority of the aforementioned studies. Grace and colleagues (2005) conducted a cross-sectional study in Canada to assess the impact of illness perception on post-CHD depression and examine gender differences in post-CHD depression and illness perception. The sample (*n* = 661) was comprised of mostly men (76%); the mean age was 61.22 years. Overall, men and women had the same level of depression. Depression was significantly associated with illness perception, indicating negative illness perception was more predominant in participants with depression. Among men, more depression was related to negative illness perceptions about the chronicity, consequences and control of the illness; other factors related to depression were race (being non-white) and lack of physical activity. Among women, only chronic course of disease was related to depression; other factors associated with depression were younger age and lack of physical activity.

Stecca and colleagues (2013) examined illness perception and depression in people with congestive heart failure (CHF), which usually is not considered an illness within the CHD category. The cross-sectional study was conducted in three hospitals in Italy. The sample included 131 (76.2%) men and 41 (23.8%) women, 38 to 69 years with a mean age of 66.43 years. Illness was negatively correlated with depression, indicating participants with low illness perception experienced less depression.

Post Coronary Heart Disease Quality of Life and Illness Perception

Alsen and colleagues (2010) examined the relationship of illness perception with HRQOL, depression and fatigue in persons with CHD living in Sweden. Illness perception was associated with outcome of CHD events. Participants with negative illness perceptions had poorer QOL post-CHD event. Both men and women had low HRQOL as compare to the non-CHD population. Participants who believed CHD will be chronic, last longer, and cause more consequences and had more emotional impairment had lower HRQOL 4 months after the CHD event. Stafford and colleagues (2009) also found an association between negative illness perceptions and poorer HRQOL in persons with CHD at baseline, 3 months and 9 months post-CHD event. Illness perception explained 16% of the variance in physical HRQOL at 3 months post-CHD event and explained 11% of the variance in physical HRQOL at 9 months post-CHD. The association between illness perception and mental HRQOL was significant, but not as strong as physical HRQOL. At 3 months post-CHD event, illness perception explained 4% of the variance in mental HRQOL and at 9 months post-CHD event, illness perception explained 3% of the variance in mental HRQOL.

In contrast, Juergens and colleagues (2010) found that psychological HRQOL was not associated with illness perception; physical functioning, however, was significantly associated with illness perception before and after CABG surgery. Illness perception explained 12% of variance in physical functioning HRQOL, suggesting that participants' perception of their surgery influenced physical functioning HRQOL 3 months post-surgery. Participants' illness perception beliefs that the consequences of their CHD will be severe or last longer were significantly related to post-surgery HRQOL.

Aalto and colleagues (2006) conducted a longitudinal study to examine the relationship between illness perception and HRQOL in 2,605 people with CHD in Finland, aged 45 to 74 years, at baseline and 1-year post-CHD event. Illness perception was associated with HRQOL at baseline and 1-year post-CHD event. Illness perception explained 16% of variance in HRQOL of at baseline and 2% at 1-year. At baseline, statistically significant illness perceptions were the perception-identity, consequences, and personal control dimensions, and consequences and personal control at 1-year.

In a longitudinal study conducted in the UK by Lau-Walker and colleagues (2008), illness perception was associated with HRQOL at the time of hospital discharge, 9 months and 3 years post-discharge in a sample of 256 persons (195 men and 53 women) with CHD, 18 years and older Personal control and identity illness perceptions, along with emergency admission and history of prior CHD, explained 43% of the variance in physical HRQOL at the 3-year compare to baseline. At the 3-year follow up, identity, personal control and cause illness perceptions were significantly associated with mental HRQOL and explained 31% of variance in mental HRQOL. This was the only study that followed participants with CHD for 3 years.

Post Coronary Heart Disease Anxiety and Illness Perception

Cherrington and her colleagues (2004) found a statistically significant modest association between anxiety and illness perception. As anxiety increased, participants were more pessimistic about their CHD. Gallagher and colleagues (2009) conducted a prospective study to examine the association between illness perception and anxiety among 120 participants with CHD before CABG surgery, after CABG surgery and 2 weeks post-discharge from a hospital in Australia. The mean age of the mostly male (77%) sample was 66.25 years. Anxiety was associated to illness perception at all three time points: before surgery, after surgery, and 2 weeks post-discharge. Having a sense of control about one’s CHD illness reduced anxiety. Illness perception explained 10% to 19% of the variance in anxiety before and after surgery. However, the effect of illness perception reduced 2 weeks after surgery and explained only 3% of variances in anxiety.

Furze and colleagues (2005) found that positive illness perception was associated with less anxiety immediately post-CHD event, but with more anxiety 1 year following the CHD event.

The studies also had limitations in their research design. Almost half of the studies featured very small samples sizes, which limits the power and validity of the studies and increases the probability of type 1 errors. The majority of these studies did not explain the effects that a small sample size can have on the interpretation of the results. In addition, some of the studies with small sample sizes also analyzed many variables, foregoing the standard rule of 10 subjects for each variable. Almost half of the studies were cross-sectional studies, which limits conclusions regarding the direction of any associations between illness perception and post-CHD depression, anxiety, and health related quality of life. Moreover, the longitudinal studies that were conducted had a short follow-up period – typically, up to one year after MI – which raises the question of whether or not a longer follow-up might have shown a greater association between illness perception and post-CHD depression, anxiety, and health related quality of life

Summary of the Findings

Results of the literature review indicate that illness perception of CHD was associated with post-CHD depression, anxiety and HRQOL and that positive illness perception was an important factor in the ability of persons with CHD to have a better recovery, fewer depressive and anxiety symptoms, and better HRQOL (Stafford et al., 2008; Keib et al., 2010; Gallagher,2009; Lau walker, 2008). Negative illness perception about CHD resulted in more depressive symptoms (Stafford et al., 2008). People who believed their CHD will be chronic, prolonged and will have negative consequences, along with believing CHD lacks a cure or cannot be controlled, were more likely to be depressed, anxious and have poorer HRQOL (Alsen et al., 2010; Dickens et al., 2008; Grace et al., 2005; Jurgens et al., 2010; Stafford et al, 2008;

Gallagher, 2009; Lau-Walker, 2008). Gender differences in illness perception were noted. Men with CHD who believed their CHD was chronic, had serious consequences and could not be controlled were more likely to be depressed compared to women who have similar illness perceptions (Grace et al., 2005). Anxiety and HRQOL were associated with illness perception. Negative illness perception of CHD resulted in more anxiety and poorer HRQOL (Lau Walker, 2008; Aalto, 2010; Cherrington, 2004; Gallagher, 2009).

Conclusions, Implications and Recommendations

Older adults with CHD were more likely to have depression, anxiety and lower HRQOL if illness perception was negative. Older persons with CHD, in particular men, likely will need more attention by healthcare providers who should screen, intervene and monitor these individuals’ illness perceptions and the impact their perceptions have on depression, anxiety and HRQOL. The literature indicates consensus that illness perception and its multiple dimensions are associated with post-CHD depression, anxiety and HRQOL, but there remains disagreement on which specific aspects of illness perception are the least and most influential. This difference may be related to the lack of a uniform conceptualization of illness perception. Operationalization of illness perception is primarily assessed with the Illness Perception Questionnaire although other measures to assess illness perception were found in the literature (Furze, 2005; Gallagher, 2009). As compared to depression and HRQOL, anxiety was not examined as often in the literature, although more positive illness perceptions were associated with less anxiety. Further research is recommended to examine illness perception on the short-term and long-term effect of anxiety.

Early intervention and education of persons with CHD can play an important role in improving illness perception, which in turn, may minimize depression and anxiety and improve

HRQOL and other health outcomes in the older adult population. Interventions should be targeted in hospital and community healthcare settings. Illness perception seems to change over time and early education regarding the CHD event could influence the outcome as early as 2 weeks and as long as 3 years post-CHD (Gallagher et al, 2009; Lau Waker, 2008). As people age, illness perception can change because of life experiences (Diefenbach & Leventhal, 1996). Older adults with CHD learning processes may change over time and their learning needs may be different than younger persons with CHD. However, this potential age distinction was not evident in the literature that included a paucity of studies specific to the 65-and-older population.

A majority of the studies were descriptive, cross-sectional and were conducted in the US and other westernized and industrialized countries similar to the US. The samples of the majority of studies were small and not comprised exclusively of adults, 65 years and older, which limits power, increases the probability of Type I errors, as well as limits generalization of the findings. Many of the studies lacked analysis based on sociodemographics, including gender, age, race/ethnicity, country of birth, etc. Social determinants influence health, health outcomes, and health beliefs and illness perceptions. There is a need for more longitudinal studies focused on gender, older and more ethnically and racially diverse persons with CHD in the US.

References

Aalto, A. M., Aro, A. R., Weinman, J., Heijmans, M., Manderbacka, K., & Elovainio, M. (2006). Sociodemographic, disease status, and illness perceptions predictors of global self-ratings of health and quality of life among those with coronary heart disease: One year follow-up study. *Quality of Life Research*, *15*, 1307-1322.

Alsen, P., Brink, E., Persson, L. O., Brandstrom, Y., & Karlson, B. W. (2010). Illness Perceptions After Myocardial Infarction Relations to Fatigue, Emotional Distress, and Health-Related Quality of Life. *Journal of Cardiovascular Nursing, 25*(2), E1-E10. doi: 10.1097/JCN.0b013e3181c6dcfd

Carney, R. M., Freedland, K. E., Steinmeyer, B., Blumenthal, J. A., de Jonge, P., Davidson, K. W., . . . Jaffe, A. S. (2009). History of depression and survival after acute myocardial infarction. *Psychosomatic Medicine*, 71, 253-259. doi:10.1097/PSY.0b013e31819b69e3

Cherrington, C. C., Moser, D. K., Lennie, T. A., & Kennedy, C. W. (2004). Illness representation after acute myocardial infarction: Impact on in-hospital recovery. American Journal of Critical Care, 13, 136–145.

Davidson, K. W., Burg, M. M., Kronish, I. M., Shimbo, D., Dettenborn, L., Mehran, R., …Rieckmann, N. (2010). Association of anhedonia with recurrent major adverse cardiac events and mortality 1 year after acute coronary syndrome. Archives of General Psychiatry, 67, 480-488. doi:10.1001/archgenpsychiatry.2010.36

Diefenbach, M.A, & Leventhal, H. (1996). The common sense model of illness representation: theoretical and practical considerations. *Journal of Social Distress and Homeless, 5*(1), 11-38.

Dickens, C., McGowan, L., Percival, C., Tomenson, B., Cotter, L., Heagerty, A., & Creed, F. (2008). Negative illness perceptions are associated with new-onset depression following myocardial infarction. *General Hospital Psychiatry, 30*(5), 414-420. doi: 10.1016/j.genhosppsych.2008.04.003

Elwy, A. R., Yeh, J., Worcester, J., & Eisen, S. V. (2011). An illness perception model of primary care patients' help seeking for depression. *Qualatative Health Research, 21*(11), 1495-1507. doi: 10.1177/1049732311413781

Frasure-Smith, N., & Lesperance, F. (2008). Depression and anxiety as predictors of 2-year cardiac events in patients with stable coronary artery disease. Archives of General Psychiatry, 65, 62-71. doi:10.1001/archgenpsychiatry.2007.4

Furze, G., Lewin, R. J., Murberg, T., Bull, P., & Thompson, D. R. (2005). Does it matter what patients think? The relationship between changes in patients' beliefs about angina and their psychological and functional status. *Journal of Psychosomatic Research, 59*(5), 323-329. doi: 10.1016/j.jpsychores.2005.06.071

Gallagher, R., & McKinley, S. (2009). Anxiety, depression and perceived control in patients having coronary artery bypass grafts. *Journal of Advanced Nursing, 65*(11), 2386-2396. doi: 10.1111/j.1365-2648.2009.05101

Glassman, A. H., Bigger, J. T., & Gaffney, M. (2009). Psychiatric characteristics associated with long-term mortality among 361 patients having an acute coronary syndrome and major depression: Seven-year follow-up of SADHART participants. Archives of General Psychiatry, 66, 1022-1029. doi:10.1001/archgenpsychiatry.2009.121

Grace, S. L., Krepostman, S., Brooks, D., Arthur, H., Scholey, P., Suskin, N., . . . Stewart, D. E. (2005). Illness perceptions among cardiac patients: relation to depressive symptomatology and sex. *Journal of Psychosomatic Research 59*(3), 153-160. doi: 10.1016/j.jpsychores.2005.05.005

Juergens, M. C., Seekatz, B., Moosdorf, R. G., Petrie, K. J., & Rief, W. (2010). Illness beliefs before cardiac surgery predict disability, quality of life, and depression 3 months later. *Journal of Psychosomatic Research, 68*(6), 553-560. doi: 10.1016/j.jpsychores.2009.10.004

Keib, C. N., Reynolds, N. R., & Ahijevych, K. L. (2010). Poor use of cardiac rehabilitation among older adults: a self-regulatory model for tailored interventions. *Heart Lung, 39*(6), 504-511. doi: 10.1016/j.hrtlng.2009.11.006

Lau-Walker, M. O., Cowie, M. R., & Roughton, M. (2009). Coronary heart disease patients' perception of their symptoms and sense of control are associated with their quality of life three years following hospital discharge. Journal of Clinical Nursing*, 18*(1), 63-71. doi: 10.1111/j.1365-2702.2008.02386

Romanelli, J., Fauerbach, J. A., Bush, D. E., & Ziegelstein, R.C. (2002). The Significance of Depression in Older Patients After Myocardial Infarction. *Journal of American Geriatrics Society*, 50: 817-822.

Stafford, L., Berk, M., & Jackson, H. J. (2009). Are illness perceptions about coronary artery disease predictive of depression and quality of life outcomes? *Journal of Psychosomatic Research*, 66(3), 211-220. doi: 10.1016/j.jpsychores.2008.09.005

Steca, P., Greco, A., Monzani, D., Politi, A., Gestra, R., Ferrari, G., . . . Parati, G. (2013). How does illness severity influence depression, health satisfaction and life satisfaction in patients with cardiovascular disease? The mediating role of illness perception and self-efficacy beliefs. *Journal of Health Psychology, 28*(7), 765-783. doi: 10.1080/08870446.2012.759223

Table 2.1

Summary of the Studies

Author (Year) and Country	**Steca et al. (2013)** **Italy**
Purpose	Evaluate effect of illness severity on depression and quality of life among CHD patient
Sample	*n* = 172: 131 (76.2%) men and 41 (23.8%) women; mean age: 66.43 years (*SD* = 9.99, range: 38-86); 119 (69.2%) with acute illness; 53 (30.8%) with chronic CHD for at least 4 years
Design	Cross-sectional
Variables/Measures	Depression: depression measured by Cognitive Behavioral Assessment 2.0 Health satisfaction: how satisfy are you with your health? Life satisfaction: Satisfaction with Life Scale Severity of illness: LVEF Illness perception: Illness Perception Questionnaire (IPQ) – Brief Self-efficacy: Cardiac Risk Factors Self-Efficacy Scale
Major Findings	-Severity of disease: significantly associated with depression, and life and health satisfaction; positively and significantly correlated with all study variables except for diagnosis and depression (negative association) -Cardiac risk factors self-efficacy beliefs positively associated with health satisfaction and life satisfaction; negatively associated with diagnosis and depression -In the absence of mediators, severity of disease had negative influence on depression and positive influence on health satisfaction; no significant association with life satisfaction -Satisfaction influenced illness severity on for depression and health satisfaction, which became significant when the two mediators were added to the model
Strengths	Specific to cardiovascular population; used valid and reliable tools specific to population; included 65 years and older
Weakness	Cross-sectional design; small sample size
Author (Year) and Country	**Dickens et al. (2008)** **United Kingdom**
Purpose	Examine association between negative illness perception and post-MI depression
Sample	313 post-MI patients; mean age: 57.7 years (*SD* =11.2); 198 (63%) men; 115 (37%) women
Design	Longitudinal (1 year)
Variables/Measures	Anxiety and depression: Hospital Anxiety and Depression Scale Illness perception: IPQ
Major Findings	-After 1 year, new episodes of depression, in part, attributable to negative illness perception about CHD -If believed MI disease will last long time, 3 times more likely to develop post-MI depression -If believed MI disease can be cured, less likely to develop depression
Strengths	Longitudinal study; valid and reliable tools; follow-up (91%); low attrition
Weakness	Self-report data
Author (Year) and Country	**Stafford et al. (2008)** **Australia**
Purpose	Assess relationship between illness perception regarding CHD and depression and

	quality of life after the CHD event
Sample	*n* = 229 post-MI patients. At 3 months, *n* = 193 (83% attrition); 156 (81%) men and 37 (19%) women; mean age: 64.14 years (*SD* = 10.37, range: 38-91. At 9 months, *n* = 184
Design	Longitudinal (baseline, 3 months and 9 months)
Variables/Measures	Anxiety and depression: Hospital Anxiety and Depression Scale (HADS) Illness perception: IPQ-R HRQOL: Short Form-36 (SF-36). Social support: Multidimensional Scale of Perceived Social Support Neuroticism: NEO PI-R, the IPIP-NEO
Major Findings	-Consequences and poorer personal control were associated with greater depressive symptomatology; no significant association between timeline, cure and identity illness perceptions and depression -Illness perception associated with worse physical HRQOL at 3 months, but not at 9 months -Perceptions of greater personal control CHD significantly predictive of better mental HRQOL
Strengths	Longitudinal design; included people 65 years and above; valid and reliable tools
Weakness	Analysis not completed for persons who refused to participate in study; high refusal rate (48%); limited generalizability; self-report data
Author (Year) and Country	**Grace et al. (2005)** **Canada**
Purpose	Examine the gender difference on illness belief regarding their cardiac disease and consequent depression
Sample	*n* = 661 post-acute coronary syndrome; mean age: 61.22 years (SD = 11.30); 157 (23.8%) women; 504 (76.2%) mean
Design	Cross-sectional
Variables/Measures	Anxiety and depression: Hospital Anxiety and Depression Scale Illness perception: IPQ-R Functional capacity: Duke Activity Status Index Exercise behavior: Health-Promoting Lifestyle Profile II
Major Findings	-Significant gender differences in depression; women experienced more depression than men -Participants believed perceived dietary habits, heredity, and stress as the greatest causes of their CVD. Men were significantly more likely to attribute causation to diet, overwork, and alcohol; women more likely to blame heredity. -Older participants were significantly more likely to endorse aging as a causal factor than were younger participants -Greater depressive symptomatology was significantly related to greater endorsement of stress or worry, mental attitude, family problems, emotional state, personality, and overwork as causal factors -For men, greater depressive symptomatology significantly related to being non-white, lower activity, less exercise, and illness perceptions (more chronicity, greater consequences, and perceived lower treatment control or cure -For women, greater depressive symptomatology significantly related to younger age, lower activity status, and illness perception (longer, more chronic time course)
Strengths	Relatively large sample size; valid and reliable tools; analysis of non-participants
Weakness	Participants were more likely to be male and younger than the nonparticipants; there was a 5-6 years age differences between participants and those who refused to participate; cross-sectional design; sample mostly white (>80%), which limits

	external validity
Author (Year) and Country	**Alsen et al. (2010)** **Sweden**
Purpose	Evaluate the association of post MI depression, fatigue, and quality of life to how patients perceive their disease
Sample	*n* = 204 post-MI patients; 145 (71%) men and 59 (29%) women; mean age: 64 years (*SD* = 10)
Design	Longitudinal cohort (first week after MI and four months after MI)
Variables/Measures	Anxiety and depression: Hospital Anxiety and Depression Scale Illness perception: IPQ-R Sociodemographics: age, gender, marital status and education Clinical: infarct marker troponin T-max, C-reactive protein, ejection fraction, and presence of a Q wave Fatigue: Multidimensional Fatigue Inventory HRQOL: SF36
Major Findings	-Illness perception changed over the 4-month period in illness perception (timeline and personal and treatment control) -Lower the personal and treatment control (illness perception) associated with more fatigue and depression -Anxiety and depression associated with lower physical and mental HRQOL
Strengths	Longitudinal study; low attrition rate; relatively large sample size; valid and reliable tools
Weakness	Not generalizable to the US population; excluded people 80 years and older; low number of women
Author (Year) and Country	**Cherrington et al. (2004)** **United States**
Purpose	Evaluate the effect of illness belief, depression and anxiety in post MI recovery
Sample	*n* = 49 post-MI patients; 24 men and 25 women; mean age: 60.8 years (*SD* = 13.32); mean age of men: 55.3 (*SD* = 9.76); mean age of women: 66.0 (*SD* = 14.31); hospital in Columbus, Ohio
Design	Prospective, correlational
Variables/Measures	Depression: Beck Depression Inventory (2nd edition) Illness perception: IPQ Anxiety: Spielberger State Anxiety Inventory
Major Findings	-Depression moderately correlated with illness perception; as depression increased, illness representation increased -No gender difference in depression -When depression controlled, illness perception still predictive of the likelihood of the occurrence of any complication, which mediates on anxiety and depression -As illness representation became more negative, the odds of experiencing a complication increased by 1.051; the mediating effects of depression and anxiety were not supported
Strengths	Reliable and valid tools
Weakness	Small sample size; White, non-Hispanic sample; cross-sectional design
Author (Year) and Country	**Furze et al. (2005)** **United Kingdom**
Purpose	Examine association between illness perception and depression and anxiety
Sample	*n* = 133 patients with angina; 81 (61%) men; 52 (39%) women; mean age: 67.99 years (*SD* = 8.96, range: 41-80
Design	Prospective longitudinal (baseline, 1 year, and 2 years)

Variables/Measures	Depression and anxiety: Hospital Anxiety and Depression Illness perception: YABQ Physical functioning: Seattle Angina Questionnaire
Major Findings	-Although there was a significant association between angina beliefs and depression at baseline, and people with more maladaptive beliefs had significantly higher depression, change in beliefs was not significantly associated with change in depression or with depression at follow-up -Psychological functioning scores indicated low distress
Strengths	Longitudinal study, low attrition: 94% retention at 1 year and 85% retention at 2 years; adequate sample size; included people aged 65 years and older; valid and reliable tools
Weakness	Sociodemographic characteristics not presented; conducted outside US; severity of CHD not assessed
Author (Year) and Country	**Juergens et al. (2010)** **Germany**
Purpose	Examine the influence of patients' pre-surgery illness beliefs and cardiac risk factors on depression and HRQOL
Sample	*n* = 56 pre- and post-CABG patients between 18 and 80 years; 42 patients responded to mail survey (75% response rate)
Design	Prospective longitudinal
Variables/Measures	Anxiety and depression: Hospital Anxiety and Depression Scale Illness perception: IPQ-R HRQOL: SF-12 Pain: Pain Disability Index
Major Findings	-Higher levels of depression 3 months after surgery were related to the beliefs of chronic illness duration, severe consequences, and low illness coherence at baseline -No relationship between age and depression
Strengths	Longitudinal study; valid and reliable tools; no differences between participants and drop out participants; included people aged 65 years and older
Weakness	Small sample size; lacked sociodemographic data; combined patients who received valve surgery with those who received CABG surgery due to small sample size

CHAPTER III

ILLNESS PERCEPTION, DEPRESSION, ANXIETY AND QUALITY OF LIFE IN OLDER ADULTS POST CORONARY HEART DISEASE EVENT

Abstract

Objectives: This study was guided by Leventhal's self-regulation theory and sought to examine the relationship between illness perception, depression, anxiety and health-related quality of life (HRQOL) of older after they experienced a coronary heart disease (CHD) event.

Methods: Participants included 58 predominantly White, non-Hispanic men (*n* = 47) and women (*n* = 11) with a mean age of 74 years who were recruited from cardiac rehabilitation centers. Participants completed the Hospital Anxiety and Depression Scale, the Illness Perception Questionnaire Revised, and the Rand-36 Health-related Quality of Life Survey.

Results: Despite negative illness perceptions about the duration, chronicity and distress of CHD, most participants had positive illness perceptions about understanding CHD, ability to control CHD, and believed that CHD could be treated. Varying dimensions of illness perception contributed significantly to the variance in depression, anxiety and HRQOL.

Conclusions: Positive illness perceptions appear to be related to less anxiety and depressive symptomatology and better HRQOL. Cardiac rehabilitation nurses should screen and manage negative illness perceptions and intervene early with age-specific cognitive reframing approaches to improve recovery, health outcomes, wellbeing and functioning of older adults after a CHD event. More research is needed with a larger, heterogeneous sample.

Keywords: illness perception, health-related quality of life, depression, anxiety, coronary heart disease, older adults

Illness Perception, Depression, Anxiety and Quality of Life in Older Adults Post Coronary Heart Disease Event

America is aging. Adults, 65 years and older, comprise nearly 13% of the United States (US) population (Fang, Yang, Hong, & Loustalot, 2012; Kramarow, Lubitz, Lentzner, & Gorina, 2007). In the US, coronary heart disease (CHD) costs $108.9 billion each year, is the leading cause of mortality, and causes 80% of deaths in adults 65 years and older (Heidenreich et al., 2011; Heron, 2012; Roger et al., 2012). As a chronic illness, CHD can lead to decreased health-related quality of life (HRQOL), increased depression and increased health expenses that could affect one's financial status in retirement (Keib, Reynolds, & Ahijevych, 2010). People with CHD are three times more at risk for depression than those without CHD (Frasure-Smith, & Lesperance, 2008). Older adults with CHD have a 25% chance of developing post-CHD depression and are four times more likely to die as compared to non-depressed counterparts (Romanelli, Fauerbach, Bush, & Ziegelstein, 2002). Depression and anxiety have been shown to have negative effects on persons with CHD. Depression has been associated with poorer prognosis, lower HRQOL, greater difficulty with treatment and medication adherence, and greater mortality (Steca et al., 2013). Anxiety has been associated with more CHD symptoms, lower HRQOL and increased hospital readmissions within 6 months of CHD event (Gallagher & McKinley, 2009).

According to Leventhal's self-regulation theory, illness perception refers to how people experience illness, understand and manage illness, and change and adopt behavior to optimize health after a health threat or illness (Leventhal, Diefenbach, & Leventhal, 1992; Meyer, Leventhal, & Gutmann, 1985). According to this theory, the individual is an active participant and problem-solver. Biopsychosociocultural factors and past experiences influence the processing of information, coping strategies and responses to an illness or a health threat. As people obtain new information about an illness or a health threat, they appraise strategies to modify health outcomes, and new illness representations or perceptions are adopted, discarded or adapted over time (Leventhal et al., 1992; Meyer et al., 1985). As people age, illness perceptions and coping strategies to deal with a health threat can change based on prior experiences (Leventhal et al., 1992).

Illness perception has been linked to health outcomes. The literature indicates illness perception is important in understanding how adults respond to and recover from an illness or a health threat. A positive illness perception may be an important protective factor in improving well-being, health outcomes and a successful recovery after a CHD event (Keib et al., 2010). There is a paucity of literature about how adults, 65 years and older, view an illness or a health threat and how it affects their health outcomes (Keib et al., 2010). A majority of the illness perception studies of people with CHD have been conducted in countries outside the US with populations younger than 65 years old. Further, illness perceptions usually have not been assessed immediately after a CHD event has occurred. Given that CHD is the leading cause of death in the US and its prevalence increases with age, understanding the illness perceptions of older adults with CHD and how illness perceptions affect their health outcomes may provide insight into designing age-specific secondary prevention interventions to promote cardiovascular health in this population.

Purpose of the Study

The purpose of the study, using Leventhal’s self-regulation theory as the theoretical underpinning, was to examine the relationship between illness perception and depressive symptoms, anxiety symptoms, and physical and mental HRQOL among older adults, 65 years and older after they had experienced a CHD event.

Method

Study Design

The study used a descriptive, correlational cross-sectional design. The Institutional Review Board of the University of California, San Francisco approved the study. Inclusion criteria were able to speak English, 65 years or older, diagnosed with CHD, post-percutaneous coronary intervention or post-coronary artery bypass graft surgery, and participating in a cardiac rehabilitation program. Exclusion criteria included a diagnosis of congestive heart failure, cognitive impairment, or major depression. To assess for severity of CHD, a 45% left ventricular ejection fraction was the cutoff for eligibility to participate in the study. The health record was used to confirm participants' medical eligibility to participate in the study.

Data Collection Procedure

Sixty-six people who met the study eligibility criteria were approached in two cardiovascular rehabilitation centers in Northern California to participate in the study. Data were collected by the primary author. Eight people (35.4%) refused to participate in the study, yielding a 12% overall study refusal rate. Major reasons given for refusal to participate included not feeling well, not interested, or not having time. There were no statistically significant differences in age, education, marital status and health history between persons who refused to participate in the study and persons who became participants. The final sample size was 58.

The study purpose, potential impact and data collection procedure, rights as a human subject and consent form were explained to participants who met the study eligibility criteria and agreed to participate in the study. Subsequently, participants were asked to sign a consent form, which included permission to access clinical data in the health record, and then to complete the study questionnaires. A copy of the consent form was provided to each participant.

Participants completed the study questionnaires online, in-person, or via phone. Time to complete the study questionnaires averaged 40 minutes. Data collection occurred for 7 months from May 2015 to December 2015. Completed questionnaires were numbered sequentially, contained no personal identifying information and were kept in a locked cabinet.

Variables and Measures

Participants were assessed for depressive and anxiety symptoms, HRQOL, illness perception, and sociodemographic characteristics.

Anxiety and depression. The 14-item Hospital Anxiety and Depression Scale was used to assess symptoms of depression (e.g., “I feel as if I am slowed down”) and anxiety (e.g., “I feel tense or ‘wound up’”) (Gallagher & McKinley, 2009). The response options range from 0 (*not having any symptoms*) to 3 (*often exhibits symptoms*). For both the depression (7 items) and anxiety (7 items) subscales, scores can range from 0 to 21 and can be categorized as low risk (0 to 7), borderline risk (8 to 10), or high risk (11 or greater). Higher scores indicate more symptoms of depression and anxiety.

Health-related quality of life. Health-related quality of life was assessed using the RAND Short Form Health Survey, which is a 36-item tool that measures eight dimensions of general HRQOL: physical functioning (10 items), role limitations due to physical health (4 items), pain (2 items), general health (5 items), role limitations due to emotional problems (3 items), emotional wellbeing (5 items), social functioning (2 items, and energy/fatigue (4 items) (Farivar, Cunningham, & Hays, 2007). Physical and mental health composite scores can be derived from the eight subscales. The physical health composite score is comprised of the physical functioning, role limitations due to physical health, pain, and general health subscales. The mental health composite score is comprised of the role limitations due to emotional problems, emotional wellbeing, social functioning and energy/fatigue subscales. Scores can range from 0 (lowest or worst possible level of functioning) to 100 (highest or best possible level of functioning), with higher scores indicating better HRQOL. The mental and physical health composite scores were designed to have a mean score of 50 and a standard deviation of 10 in a representative sample of the U.S. population and can be categorized as low HRQOL (mean score of 50 or less) and high HRQOL (mean score greater than 50) (Farivar et al., 2007). Scores greater than 50 represent above average HRQOL.

Illness perception. The 56-item Illness Perception Questionnaire-Revised was used to assess illness perception on eight dimensions: identity (14 items), timeline acute-chronic (6 items), timeline cyclical (4 items), consequences (6 items), personal control (6 items), treatment control (5 items), illness coherence (5 items), and emotional representation (6 items) (Moss-Morris, Weinman, Petrie, Horne, Cameron, & Buick, 2002). The identity subscale assesses the experience of 14 symptoms: pain, sore throat, nausea, breathlessness, weight loss, fatigue, stiff joints, sore eyes, wheeziness, headaches, upset stomach, sleep difficulties, dizziness, and loss of strength. For each symptom, the respondent indicates *yes* or *no* if he or she believes the symptom is the cause of his or her illness. 'Yes' responses are counted and averaged to yield the mean number of symptoms believed to cause the illness. A higher mean score indicates a greater number of symptoms is believed to be attributed to the illness.

The timeline (acute-chronic) subscale assesses perception of the duration of the illness, for example, whether the respondent believes the illness will last a short time or a long time, or is permanent or temporary (Moss-Morris et al., 2002). The timeline (cyclic) subscale assesses perception about the fluctuations of symptoms, for example, “My symptoms come and go in cycles.” The consequences subscale assesses perception of illness severity and how it will affect a person’s life. The personal control subscale assesses whether the respondent believes he or she has control over the illness, for example, “The course of my illness depends on me.” The treatment control subscale assesses whether the respondent believes treatment for the illness will be effective. The illness coherence subscale assesses the respondent’s understanding of the illness. Lastly, the emotional representation subscale assesses the respondent’s distress about the illness. Response options range from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate strongly held beliefs that the illness will be chronic, illness symptoms will occur often, consequences of the illness will be negative, the illness can be controlled personally, the illness can be treated, a greater understanding of the illness, and the illness causes distress.

Sociodemographic Characteristics. The following sociodemographic data were collected: gender (male or female), race/ethnicity (White, non-Hispanic, Asian, African American or other), employment (retired, employed or unemployed), education (high school, some college, Bachelor’s degree or graduate degree), and partnership status (married/partnered or divorced/widowed).

Data Analysis

All data were self-reported. There were no missing data. Data were entered, verified and analyzed using the Statistical Package for Social Sciences for Windows version 23 (IBM, 2015). Descriptive statistics were calculated and mean scores for the study variables were normally distributed. Cronbach’s alpha internal consistency reliability coefficients for the study questionnaires were above .70 and acceptable (see Table 1).

Pearson’s *r* correlations were computed to examine relationships between illness perception and depressive symptoms, anxiety symptoms, physical HRQOL and mental HRQOL. Based on the conceptual model presented in Figure 1, underpinned by Leventhal’s self-regulation theory, multiple linear regression analyses were computed to determine the influence of illness perception (predictor variables) and age (covariate) on depressive symptoms, anxiety symptoms, physical HRQOL and mental HRQOL (outcome variables). Prior to regression analysis, preliminary analyses were performed to ensure there was no violation of the assumptions of normality, linearity and homoscedasticity. An alpha level of $p \leq .05$, two tailed, determined statistical significance for $n = 58$.

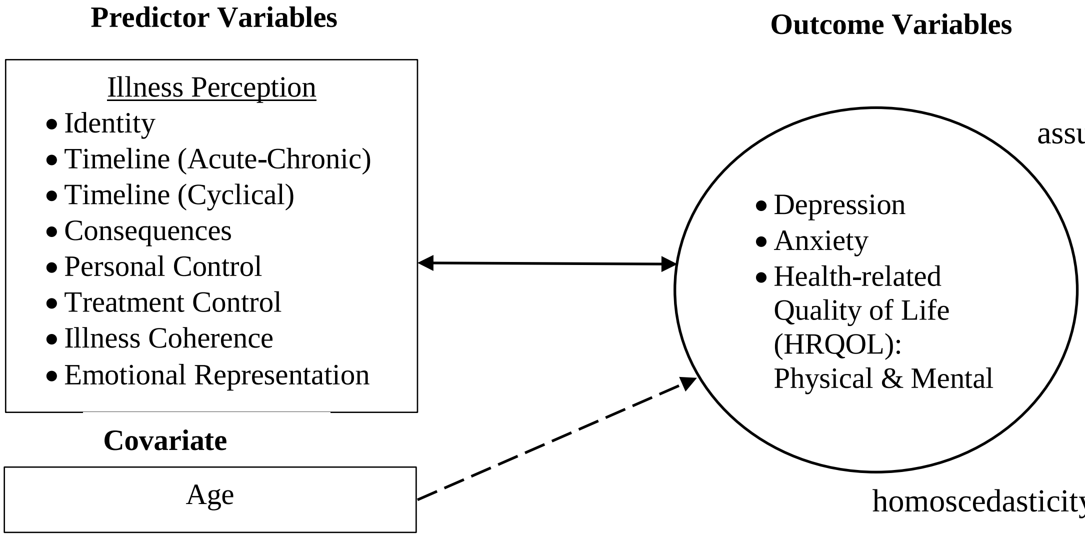


Figure 3.1. Conceptualization of Illness Perception and Age on Depression, Anxiety and HRQOL

Participants

The 58 participants had experienced a recent CHD event and were participating in a cardiac rehabilitation program. The average left ventricular ejection fraction for the study sample was 52.41 (*SD* = 4.07) with a range of 45% to 60%. The sample was comprised of 47 men (81%) and 11 women (19%), ranging in age from 65 to 88 years with a mean age of 74 years (*SD* = 6.79). A majority of the sample was White, non-Hispanic (86.2%, *n* = 50), married/partnered (77.6%, *n* = 45), retired (66%), and had completed some college or higher level of education (88%) (see Table 1). Non-White participants represented 18.7% (*n* = 7) of the sample. None of the participants was single/never married and 22.4% (*n* = 13) of participants were divorced/widowed. Although a majority of participants were retired, 25.9% (*n* =15) were employed and 8.6% (*n* =5) were unemployed. Among the participants, 12.1% (*n* = 7) completed high school, 13.8% (*n* = 8) had some college education and 74.1% had an undergraduate or college degree (*n* = 43).

Results

Participants' mean scores for depressive symptoms, anxiety symptoms, physical HRQOL, mental HRQOL and illness perception are presented in Table 1. There were no statistical differences in mean scores for the study variables by sociodemographic characteristics of the sample. The depressive symptom mean score was 4.71 (*SD* = 4.06) and the anxiety symptom mean score was 4.21 (*SD* = 3.53). A majority of sample was low risk for anxiety (*n* =

50, 86%) and depression (*n* = 46, 79%). Six (10%) participants were borderline risk for anxiety and two (3%) participants were high risk for anxiety. Six (10%) participants were borderline risk for depression and six (10%) participants were high risk for depression.

The mean score was 72.54 (*SD* = 18.04) for the mental HRQOL and 70.41 (*SD* = 17.57) for the physical HRQOL, indicating the sample had above average mental and physical health functioning (see Table 1). The proportion of the sample who had low physical HRQOL (mean score of 50 or less) was 14.0% (*n* = 8) and the proportion of the sample who had high physical HRQOL (mean score greater than 50) was 86.0% (*n* = 49). The proportion of the sample who had low mental HRQOL (mean score of 50 or less) was 13.8% (*n* = 8) and the proportion of the sample who had mental physical HRQOL (mean score greater than 50) was 86.2% (*n* = 50).

Table 3.1

Summary Descriptive Statistics and Cronbach's Alpha Internal Consistency Reliability Coefficients for the Study Questionnaires (n = 58)

Subscale	Scale Range	*Range*	*M*	*SD*	*α*
Hospital Anxiety and Depression Scale					
Depression	0-21	0-15	4.71	4.06	.80
Anxiety	0-21	0-15	4.21	3.53	.84
Rand Short Form-36 Health-related Quality of Life Survey					
Mental Health Composite	0-100	20-94	72.54	18.04	.89
Low (*n* = 8, 13.8%)					
High (*n* = 50, 86.2%)					
Physical Health Composite	0-100	33-98	70.41	17.57	.91

Subscale	Scale Range	*Range*	*M*	*SD*	*α*
Low (*n* = 8, 14.0%)					
High (*n* = 49, 86.0%)					
Illness Perception Questionnaire - Revised					
Identity	0-13	0-13	3.19	2.66	.78
Timeline Acute-Chronic	6-30	6-28	17.36	6.01	.90
Timeline Cyclical	4-20	4-16	8.74	3.94	.92
Consequences	6-30	6-27	17.72	4.32	.75
Personal Control	6-30	8-30	23.03	4.81	.90
Treatment Control	5-25	14-25	19.57	3.00	.74
Illness Coherence	5-25	6-25	19.12	4.36	.89
Emotional Representation	6-30	6-24	15.07	4.50	.82

Eight aspects of illness perception were assessed. See Table 1 for the mean scores, which were slightly above average. Participants attributed a low number of symptoms to CHD (identity) (*M* = 3.19, *SD* = 2.66). Participants' illness perception means scores suggest they believed CHD would be chronic (timeline acute-chronic) (*M* = 17.36, *SD* = 6.01), CHD symptoms would occur often (timeline cyclic) (*M* = 8.74, *SD* = 3.94), CHD would have negative consequences (consequences) (*M* = 17.72, *SD* = 4.32), and CHD caused distress (emotional representation) (*M* = 15.07, *SD* = 4.50). Despite negative illness perceptions about the duration (timeline acute-chronic), chronicity (timeline cyclic) and distress of CHD (emotional representation), participants believed they could control CHD (personal control) (*M* = 23.03, *SD* = 4.81), CHD could be treated (treatment control) (*M* = 19.57, *SD* = 3.00), and understood CHD (illness coherence) (*M* = 19.12, *SD* = 4.36).

There were statistically significant correlations between certain aspects of illness perception and depressive symptoms, anxiety symptoms, mental HRQOL and physical HRQOL (see Table 2). More depressive symptoms were significantly associated with the belief that CHD would be chronic (*r* = .23), CHD symptoms would occur more often (*r* = .26), CHD cannot be treated (*r* = -.38), and difficulty understanding CHD (*r* = -.33). More anxiety symptoms were significantly associated with attributing a greater number of symptoms to CHD (*r* = .23), believing CHD would be chronic (*r* = .30), CHD symptoms would occur more often (*r* = .38), and CHD caused distress (*r* = .49). Moreover, more anxiety symptoms were significantly associated with illness perceptions that CHD could not be controlled (*r* = -.23), CHD could not be treated (*r* = -.42), and difficulty understanding CHD (*r* = -.37).

Table 3.2

Correlation Matrix of Illness Perception Assessed in Depression, Anxiety and Health-related Quality of Life (n = 58)

Illness Perception	Depression	Anxiety	Mental Health Quality of Life	Physical Health Quality of Life
Identity	.06	$.23^{*}$	$-.45^{**}$	$-.51^{**}$
Timeline Acute-Chronic	$.23^{*}$	$.30^{*}$	$-.25^{*}$	$-.30^{*}$
Timeline Cyclical	$.26^{*}$	$.38^{**}$	$-.47^{**}$	$-.44^{**}$
Consequences	-.05	.16	$-.37^{**}$	$-.40^{**}$
Personal Control	-.19	$-.23^{*}$	$.29^{*}$	.15
Treatment Control	$-.38^{**}$	$-.42^{**}$	$.47^{**}$	$.37^{**}$
Illness Coherence	$-.33^{**}$	$-.37^{**}$	$.50^{**}$	$.47^{**}$
Emotional Representation	.21	$.49^{**}$	$-.50^{**}$	$-.35^{**}$

$^{*}p < .05$. $^{**}p < .01$.

All of the subscales of illness perception were significantly correlated with mental HRQOL. See Table 2. Better mental HRQOL was significantly associated with a lower number of symptoms attributable to CHD (r = -.45) and beliefs that CHD would not be chronic (r = -.25), CHD symptoms would not occur often (r = -.47), CHD would not have negative consequences (r = -.37), and CHD did not cause distress (r = -.50). Moreover, better mental HRQOL was significantly associated with beliefs that CHD could be controlled, (r = .29), CHD could be treated (r = .47), and better understanding of CHD (r = .50). Better physical HRQOL was significantly associated with a lower number of symptoms attributable to CHD (r = -.51) and beliefs that CHD would not be chronic (r = -.30), CHD symptoms would not occur often (r = -

.44), CHD would not have negative consequences (*r* = -.40), and CHD did not cause distress (*r* = -.35). Furthermore, better physical HRQOL were significantly associated with beliefs that CHD could be treated (*r* = .37) and better understanding of CHD (*r* = .47).

Results of the multiple linear regression analyses indicate the models for depression, anxiety, mental HRQOL and physical HRQOL were statistically significant (see Tables 3 and 4). Illness perception and age accounted for 29% of the variance in depression (*F* = 2.194, *p* = .04), 40% of the variance in anxiety (*F* = 3.584, *p* = .002), 49% of the variance in mental HRQOL (*F* = 5.207, *p* = .0001), and 45% of the variance in physical HRQOL (*F* = 4.438, *p* = .0001). In the depression model, believing CHD would have negative consequences (β = -.45, *p* =.02) contributed significantly to the variance in depression, suggesting participants with more depressive symptomatology believed CHD did not have negative consequences. In the anxiety model, believing CHD caused distress (β = .45, *p* =.004) contributed significantly to the variance in anxiety, suggesting participants with more anxiety symptoms believed CHD caused distress. In both the mental and physical HRQOL models, the number of symptoms believed to be attributed to CHD (β = -.30, *p* =.03 and β = -.47, *p* =.001, respectively) contributed significantly to the variance in mental and physical HRQOL, indicating participants with better mental and physical HRQOL attributed a lower number of symptoms to CHD.

Table 3.3

Regression Analysis of Illness Perception and Age on Depression and Anxiety (n = 58)

Variable	Depression Model [a]			Anxiety Model [b]		
	Standardized β	t	p	Standardized β	t	p
Illness Perception						
Identity	.01	.047	.96	.08	.508	.61
Timeline Acute-Chronic	.13	.748	.46	.13	.775	.44
Timeline Cyclical	.11	.676	.50	14	.931	.36
Consequences	-.45	-2.532	.02	-.30	-1.865	.07
Personal Control	.29	1.470	.15	.17	.937	.35
Treatment Control	-.49	-1.925	.06	-.37	-1.742	.09
Illness Coherence	-.17	-.910	.37	.01	.058	.95
Emotional Representation	.18	1.076	.29	.45	3.014	.004
Age	-.04	-.273	.79	-.15	-1.165	.25

[a] Depression model: $R^2 = .29$, $F(9, 48) = 2.194$, $p = .04$.

[b] Anxiety model: $R^2 = .40$, $F(9, 48) = 3.584$, $p = .002$.

Table 3.4

Regression Analysis of Illness Perception and Age on Mental and Physical Health-related Quality of Life (n = 58)

Variable	Mental Health Model [a]			Physical Health Model [b]		
	Standardized β	*t*	*p*	Standardized β	*t*	*p*
Illness Perception						
Identity	-.30	-2.188	.03	-.47	-3.369	.001
Timeline Acute-Chronic	.01	.070	.95	-.21	-1.334	.19
Timeline Cyclical	-.10	-.682	.50	-.15	-1.020	.31
Consequences	.02	.137	.89	.01	.089	.93
Personal Control	.10	.612	.54	.08	.460	.65
Treatment Control	.19	.981	.33	-.09	-.446	.66
Illness Coherence	.18	1.156	.25	.30	1.854	.07
Emotional Representation	-.21	-1.533	.13	.08	.553	.58
Age	.20	1.732	.09	.01	.106	.92

[a] Mental health model: $R^2 = .49$, $F(9, 48) = 5.207$, $p = .0001$

[b] Physical health model: $R^2 = .45$, $F(9, 48) = 4.438$, $p = .0001$.

Discussion

Even though the literature indicates illness perception may be critical to how people respond and recover from an illness or health threat, there is a paucity of literature about how older adults, who have the highest CHD morbidity and mortality, view an illness or a health threat and how illness perceptions affect health outcomes (Keib et al., 2010). Guided by Levethal's self-regulation theory, the purpose of the study was to examine the ways in which adults, 65 years and older, viewed CHD and the relationship illness perceptions have with symptoms of depression and anxiety and physical and mental functioning while participating in cardiac rehabilitation post-CHD episode.

The predominantly White, non-Hispanic was partnered, retired, highly educated, and had co-existing health conditions. A majority of participants were low risk for anxiety and depression as well as for mental and physical health dysfunction. These relationships did not vary by health or sociodemographic characteristics. Although a majority of participants attributed a low number of symptoms to CHD, referred to as identity, they did perceive that CHD symptoms would occur often (timeline cyclic), be chronic (timeline acute-chronic) and have negative consequences. Many participants reported CHD-related distress (emotional representation). Despite negative illness perceptions about the duration, chronicity and distress of CHD, a majority of participants believed they were in control of their illness (personal control), that CHD could be treated (treatment control), and that they had a good understanding of CHD (illness coherence).

Participants who reported higher depressive symptomatology believed CHD was chronic, cyclic, untreatable and not easily understandable. Participants who reported higher anxiety symptoms attributed a greater number of symptoms and distress to CHD and believed CHD was chronic, cyclic, uncontrollable, untreatable and not easily understandable. Better mental health functioning was associated with less distress, less number of symptoms attributable to CHD, and illness perceptions that CHD was not chronic or cyclic, did not have negative consequences and was controllable, treatable and easily understandable. Better physical health functioning was associated with less distress, lower number of symptoms attributable to CHD, and illness perceptions that CHD was not chronic or cyclic, did not have negative consequences, and was treatable and easily understandable.

Varying dimensions of illness perception contributed significantly to the variance explained in depression, anxiety and mental and physical health functioning. Believing CHD would have negative consequences was significantly related to depression, but not anxiety. Other studies have shown that believing CHD will have negative consequences was associated with both depression and anxiety (Dickens et al., 2008; Stafford et al., 2008). In this study, 3% of participants were at high risk for anxiety and 10% of participants were at high risk for depression. Although these percentages are higher than the general population, the proportions are lower for depression and anxiety as compared to other similar samples in the CHD literature (Grace et al., 2005; Gallagher & McKinley, 2009). The older adults in this study seemed well-adjusted and evidenced few symptoms of depression and anxiety, suggesting participating in cardiac rehabilitation may have helped them to learn positive coping strategies, which they used to deal with the experience of CHD.

Coronary heart disease-related distress, referred to as emotional representation, contributed significantly to the variance in anxiety, suggesting participants with more anxiety symptoms were distressed as a result of CHD. Finally, number of symptoms believed to be attributed to CHD, known as the identity dimension of illness perception, contributed significantly to the variance in mental and physical health functioning, suggesting participants with better mental and physical health functioning attributed a lower number of symptoms to CHD. Other studies suggest that attributing a greater number of symptoms to CHD, in particular pain, was related to poorer mental and physical health functioning in older adults with CHD (Aalto et al., 2006; Dickens et al., 2008; Furze, Lewin, Murberg, Bull, & Thompson, 2005; Lau-Walker, Cowie, & Roughton, 2009; Stafford et al., 2008).

Limitations

A major study limitation was the cross-sectional design, which was temporal and did not allow for observing changes over time and establishing causality between illness perception and depression and anxiety symptoms and mental and physical HRQOL. This study design, however, has been commonly used among cardiovascular researchers to examine similar variables in similar populations because there are fewer attrition issues and the design is efficient for gathering information from hard-to-reach populations at a specific point in time (Alsen, Brink, Persson, Brandstrom, & Karlson, 2010; Dickens et al., 2008; Grace et al., 2005; Juergens, Seekatz, Moosdorf, Petrie, & Rief, 2010; Steca et al., 2013; Stafford et al., 2008). Other study limitations were the small nonprobability, convenience sample, the regional geographic location, self-reported data and recall bias, which limit the external validity of the study, and thus, generalization of the findings. The illness perception literature on older adults post-CHD, participating in cardiac rehabilitation, is sparse in the US. This study is one of the few studies that explored the relationship between illness perceptions and depression, anxiety, and HRQOL in the older adult population post-CHD.

Conclusions, Implications and Recommendations

In this study of mostly White, non-Hispanic males participating in cardiac rehabilitation post-CHD event, positive illness perceptions appear to be related to less anxiety and depressive symptomatology and better HRQOL. Study findings highlight the importance of cardiac rehabilitation nurses intervening to address older adults’ illness perception and its effect on emotional, psychological and physical health and wellbeing post-CHD event. This targeted focus should include addressing identity (number of symptoms attributable to CHD), which appears to contribute significantly to better mental and physical health functioning. In addition, addressing the illness perception beliefs that CHD will have negative consequences and will cause distress may help to minimize depression and anxiety symptoms in older adults following a CHD event.

Secondary and tertiary prevention interventions for older adults with CHD should involve the illness perception concept in order to understand how older people experience and manage illness in order to help this population develop coping strategies and skills to adopt behaviors that will optimize health. There is a need to screen, assess and manage illness perceptions in the plan of care prior to discharge from the hospital to cardiac rehabilitation and to intervene early with age-specific cognitive reframing approaches to improve recovery, health outcomes, wellbeing and functioning of older adults after a CHD event. More research is needed with a larger, heterogeneous sample and a longitudinal design that will allow for repeated measurement of variables and observations of changes over time.

References

Aalto, A. M., Aro, A. R., Weinman, J., Heijmans, M., Manderbacka, K., & Elovainio, M. (2006). Sociodemographic, disease status, and illness perceptions predictors of global self-ratings of health and quality of life among those with coronary heart disease: One year follow-up study. *Quality of Life Research*, *15* (8), 1307-1322.

Alsen, P., Brink, E., Persson, L. O., Brandstrom, Y., & Karlson, B. W. (2010). Illness perceptions after myocardial infarction relations to fatigue, emotional distress, and health-related quality of life. *Journal of Cardiovascular Nursing, 25* (2), E1-E10. doi: 10.1097/JCN.0b013e3181c6dcfd

Dickens, C., McGowan, L., Percival, C., Tomenson, B., Cotter, L., Heagerty, A., & Creed, F. (2008). Negative illness perceptions are associated with new-onset depression following myocardial infarction. *General Hospital Psychiatry, 30* (5), 414-420. doi: 10.1016/j.genhosppsych.2008.04.003

Fang, J., Yang, Q., Hong, Y., & Loustalot, F. (2012). Status of cardiovascular health among adult Americans in the 50 states and the District of Columbia, 2009. *Journal of American Heart Association*. 1:e005371 doi: 10.1161/JAHA.112.005371

Farivar, S. S., Cunningham, W. E., & Hays, R. D. (2007). Correlated physical and mental health summary scores for the SF-36 and SF-12 health survey, v.1. *Health and Quality of Life Outcomes*, *5*, 54-61: doi:10.1186/1477-7525-5-54

Frasure-Smith, N., & Lesperance, F. (2008). Depression and anxiety as predictors of 2-year cardiac events in patients with stable coronary artery disease. *Archives of General Psychiatry*, 65, 62-71. doi:10.1001/archgenpsychiatry.2007.4

Furze, G., Lewin, R. J., Murberg, T., Bull, P., & Thompson, D. R. (2005). Does it matter what patients think? The relationship between changes in patients' beliefs about angina and their psychological and functional status. *Journal of Psychosomatic Research, 59* (5), 323-329. doi: 10.1016/j.jpsychores.2005.06.071

Gallagher, R., & Mckinley, S. (2009). Anxiety, depression and perceived control in patients having coronary artery bypass grafts. *Journal of Advanced Nursing*, *65* (11), 2386-2396. doi: 10.1111/j.1365-2648.2009.05101.x

Grace, S. L., Krepostman, S., Brooks, D., Arthur, H., Scholey, P., Suskin, N.,…Stewart, D. E. (2005). Illness perceptions among cardiac patients: relation to depressive symptomatology and sex. *Journal of Psychosomatic Research, 59* (3), 153-160. doi: 10.1016/j.jpsychores.2005.05.005

Heidenreich, P. A., Trogdon, J. G., Khavjou, O. A., …, Woo, J. (2011). Forecasting the future of cardiovascular disease in the United States: A policy statement from the American Heart Association. *Circulation*, 123, 933-944. doi: 10.1161/CIR.0b013e31820a55f5

Heron, M. (2012). Deaths: Leading causes for 2008. *National Vital Statistics Reports*, 60 (6). doi: http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_06.pdf

IBM Corporation (2015). *IBM SPSS Statistics*. Somers, NY: author.

Juergens, M. C., Seekatz, B., Moosdorf, R. G., Petrie, K. J., & Rief, W. (2010). Illness beliefs before cardiac surgery predict disability, quality of life, and depression 3 months later. *Journal of Psychosomatic Research, 68* (6), 553-560. doi: 10.1016/ j.jpsychores.2009.10.004

Keib, C. N., Reynolds, N. R., & Ahijevych, K. L. (2010). Poor use of cardiac rehabilitation among older adults: A self-regulatory model for tailored interventions. *Heart & Lung, 39* (6), 504-511. doi: 10.1016/j.hrtlng.2009.11.006

Kramarow, E., Lubitz, J., Lentzner, H., & Gorina, Y. (2007). Trends in the health of older Americans, 1970–2005. *Health Affairs,* 26 (5), 1417-1425.

Lau-Walker, M. O., Cowie, M. R., & Roughton, M. (2009). Coronary heart disease patients' perception of their symptoms and sense of control are associated with their quality of life three years following hospital discharge. *Journal of Clinical Nursing, 18* (1), 63-71. doi: 10.1111/j.1365-2702.2008.02386

Leventhal, H., Diefenbach, M., & Leventhal, E. (1992). Illness cognition: Using common-sense to understand treatment adherence and affect cognition interactions. *Cognitive Therapy and Research, 16*, 143-163. doi:10.1007/BF01173486

Meyer, D., Leventhal, H., & Gutmann, M. (1985). Common-sense models of illness: The example of hypertension. *Health Psychology*, 4, 115-135.

Moss-Morris, R., Weinman, J., Petrie, K. J., Horne, R., Cameron, L. D., & Buick, D. (2002). The revised illness perception questionnaire (IPQ-R). *Psychology and Health, 17*, 1-16.

Roger, V. L., Go, A. S., Lloyd-Jones, D. M., Benjamin, E. J., Berry, J. D.,…Turner, W. B. (2012). Heart disease and stroke statistics—2012 update: A report from the American Heart Association. *Circulation,* 125 (1), e2–e220. doi: 10.1161/CIR.0b013e31823ac046

Romanelli, J., Fauerbach, J. A., Bush, D. E., & Ziegelstein, R.C. (2002). The Significance of Depression in Older Patients After Myocardial Infarction. *Journal of American Geriatrics Society, 50*: 817-822.

Stafford, L., Berk, M., & Jackson, H. J. (2008). Are illness perceptions about coronary artery disease predictive of depression and quality of life outcomes? *Journal of Psychosomatic Research, 66* (3), 211-220. doi: 10.1016/j.jpsychores.2008.09.005

Steca, P., Greco, A., Monzani, D., Politi, A., Gestra, R., Ferrari, G.,…Parati, G. (2013). How does illness severity influence depression, health satisfaction and life satisfaction in patients with cardiovascular disease? The mediating role of illness perception and self-efficacy beliefs. *Psychology & Health, 28* (7), 765-783. doi: 10.1080/08870446.2012.759223

CHAPTER IV

ILLNESS PERCEPTIONS OF OLDER ADULTS IN CARDIAC REHABILITATION

Abstract

Objectives: The purpose of the study was to describe the illness perceptions of older adults participating in cardiac rehabilitation following a coronary heart disease (CHD) event, taking into consideration sociodemographic characteristics.

Methods: Fifty-eight predominantly White, non-Hispanic men (n = 47) and women (n = 11), 65 to 88 years, participating in a phase II cardiac rehabilitation program completed the Illness Perception Questionnaire Revised. In addition, sociodemographic and health data were collected.

Results: Statistically significant differences in illness perceptions varied by sociodemographic characteristics. The 65-to-75 year old adults believed CHD could be personally controlled more than adults aged 76 and older (t(56) = 2.006, p = .05). As compared to participants who were employed or retired, those who were unemployed believed CHD would last a longer time (F(2, 55) = 3.209, p = .05). Divorced/widowed participants reported a greater number of symptoms that they believed were attributed to CHD as compared to married/partnered participants (t(56) = 2.539, p = .01). As compared to participants born in the US, participants not born in the US believed CHD symptoms would fluctuate and occur often (t(56) = 2.630, p = .01).

Conclusions: Sociodemographics should be taken into consideration when assessing illness perceptions in older adults attending a cardiac rehabilitation program post-CHD event. Cardiac rehabilitation nurses should screen and manage illness perceptions early during the intake phase, noting participants' sociodemographic characteristics; and then, they should tailor and modify interventions accordingly, which may result in increased completion of cardiac rehabilitation.

Keywords: illness perception, older adults, cardiac rehabilitation, social determinants

Illness Perceptions of Older Adults in Cardiac Rehabilitation

One out of three Americans will die of coronary heart disease (CHD), the leading cause of mortality for populations of most races/ethnicities and gender (Heron, 2012; Roger et al., 2012). The percentage of CHD mortality in 2008 was 25.1% for Whites, non-Hispanic, 24.5% for African Americans, 23.2% for Asians/Pacific Islanders, 20.8% for Latinos, and 18% for American Indians/Alaska Natives (Heron, 2012). About 5.8% of all White, non-Hispanic women, 7.8% of African American women, and 5.6% of Mexican American women have CHD (Roger et al., 2012). Yearly, CHD costs $108.9 billion and causes 80% of deaths in adults age 65 years and older (Heidenreich et al., 2011; Keib, Reynolds, & Ahijevych, 2010). As a chronic illness, CHD impacts older adults' daily living (American Hospital Association, 2007; Keib et al., 2010). Cardiac rehabilitation has been shown to be effective in helping people post-CHD recover more quickly and reduce morbidity and mortality if they participate as compared to people who do not participate in cardiac rehabilitation programs. Yet, only half of people after a CHD event participate in cardiac rehabilitation in the United States (US) (Herman, Liebergall, & Rott, 2014). Among the elderly, women and ethnic and racial minorities, participation in cardiac rehabilitation programs is even lower (Alsen, Brink, Persson, Barndstrom, & Karlson, 2010; Blair et al., 2014; Keib et al., 2010).

Lack of attendance and adherence to cardiac rehabilitation programs have been associated with illness perception—how people view CHD disease (Lau-Walker, 2006). Cardiac rehabilitation research shows that there is need to focus on illness perception and how it influences the effectiveness of rehabilitation in improving or making worse health outcomes among older adults with CHD (De Melo Ghisi, Polyzotis, Oh, Pakosh, & Grace, 2013; Lau-Walker, Cowie, & Roughton, 2009). Understanding illness perception in people with CHD appears to be key to developing cognitive and behavioral interventions to minimize risk of post-CHD conditions (Keib et al., 2010; Lau-Walker et al., 2009; Steca et al., 2013). The U.S. literature, however, is sparse in its description of the illness perceptions of older adults with CHD who participate in cardiac rehabilitation. Having a better understanding of illness perceptions in the older adult population with CHD may help cardiac rehabilitation nurses understand this population’s decision-making process about not only whether to participate or not participate in, but also about adherence to cardiac rehabilitation and the impact their decision may have on recovery and health outcomes.

Purpose of the Study

The purpose of this study was to describe the illness perceptions of older adults participating in cardiac rehabilitation following a CHD event, taking into consideration sociodemographic characteristics.

Theory of Self-Regulation

Illness perception is the central focus of the theory of self-regulation (Leventhal, Diefenbach, & Leventhal, 1992; Meyer, Leventhal, & Gutmann, 1985). Illness perception, the way people experience illness and adjust their perceptions about illness and ensuing complications, is believed to influence health outcomes by actively self-regulating through self-control and self-efficacy (Lau-Walker, 2006, 2007). According to Leventhal and colleagues (1992), illness perception refers to how an individual views his or her illness and how preconceived notions of a disease that are developed before the illness can predict short-term health outcomes. A positive illness perception of CHD has been shown to be an important factor in one’s ability to have a better recovery and less post-CHD complications (Stecca et al., 2013). Conversely, a negative illness perception of CHD has been shown to increase the probability of

CHD-related mortality, poor prognosis and depression (Blair et al., 2014; Dickens et al., 2008; Grace et al., 2005; Stafford, Berk, & Jackson, 2008).

Self-regulation theory explains and predicts how people understand, problem-solve and manage health conditions and health outcomes after a health threat (Leventhal et al., 1992). As people age, illness perceptions, information processing and coping strategies and response to dealing with a health threat can change based on prior experiences and biological and sociocultural factors. According to Leventhal and colleagues, the theory of self-regulation is a dynamic, adaptive system comprised of three major phases that occur over time, but is not unidirectional: (a) acknowledgment of the health threat and representation of the emotion (cognitive representation), (b) development of a plan of action specific to the situation (coping), and (c) evaluation of coping strategies, behavioral actions and expected health outcomes, that is, whether the person responds positively or negatively to situational stimuli or health status (appraisal). In addition, the illness perception experience is presumed to be cumulative. As people obtain new information about their health condition, new illness perceptions, coping and appraisal are adopted, discarded or adapted based upon experiences over time. Individual and social (e.g., culture, family and community) norms, values and beliefs can affect self-regulatory behavior (Leventhal et al., 1992).

There are five components of illness perception: identity, cause, timeline, consequences, and curability/controllability (Leventhal et al., 1992; Meyer et al., 1985). Identity refers to the health condition and its signs and symptoms as perceived by the person. Cause refers to the origin or antecedent of the health condition that is typically based on one’s subjective ideas, knowledge, and experiences as well as hereditary and other external and internal stimuli. Timeline refers to the predictive belief about the duration of the health condition and whether it is acute, chronic, or cyclic. Consequences refer to one's beliefs about the effects of the health condition on his or her physical, psychological, emotional, social and financial wellbeing. Curability/controllability are beliefs about whether the health condition can be cured or kept under control by the person.

Method

Study Design

In this descriptive, cross-sectional study, adults, aged 65 years and older, were recruited from two cardiovascular rehabilitation centers in the San Francisco Bay Area. Participants had to be able to speak English and had to be diagnosed with CHD and post-percutaneous coronary intervention or post-coronary artery bypass graft surgery. Persons with congestive heart failure, cognitive impairment, major depression, or a 45% or lower left ventricular ejection fraction were excluded. The average left ventricular ejection fraction for the study sample was 52.41 (*SD* = 4.07) with a range of 45% to 60%. The health record was used to confirm participants' medical eligibility to participate in the study. The Institutional Review Board of the University of California, San Francisco approved the study.

Data Collection Procedure

The researcher contacted 66 people (50 men and 16 women) who were participating in cardiac rehabilitation programs and met the study eligibility criteria. Eight people, five women (31%) and three men (4.5%), refused to participate in the study, yielding a 12% overall study refusal rate. Major reasons given for refusal to participate included: not feeling well, not interested, or not having time. There were no statistically significant differences in age, education, marital status and health history between persons who refused to participate in the study and persons who became participants. The final sample size was comprised of 58 (47 men and 11 women) participants who were attending a phase II cardiac rehabilitation program, which is the transitional phase of cardiac rehabilitation after discharge from the hospital. The major goal of this cardiac rehabilitation phase is a smooth transition from hospital to home by improving participants' physical work capacity, muscle strength and endurance, focusing on cardiovascular health and lifestyle modification, and developing skills for behavior change.

After the researcher explained the study, informed consent was obtained from participants, who subsequently signed the consent form, which included permission to access clinical data in the health record and complete the study questionnaires. A copy of the consent form was provided to each participant. Participants completed the study questionnaires online, in-person or via phone. Time to complete the study questionnaires averaged 40 minutes. Data collection occurred for 7 months from May 2015 to December 2015. Completed questionnaires were numbered sequentially, contained no personal identifying information and were kept in a locked cabinet.

Illness Perception Measure

Participants' illness perceptions were assessed using the 56-item Illness Perception Questionnaire-Revised (Moss-Morris, Weinman, Petrie, Horne, Cameron, & Buick, 2002). The questionnaire assesses eight aspects of illness perception: identity (14 items), timeline acute-chronic (6 items), timeline cyclical (4 items), consequences (6 items), personal control (6 items), treatment control (5 items), illness coherence (5 items), and emotional representation (6 items). In the current study, Cronbach's alpha internal consistency reliability coefficients, shown in parentheses, for the eight dimensions of the Illness Perception Questionnaire-Revised were acceptable: identity (.78), timeline acute-chronic (.90), timeline cyclical (.92), consequences (.75), personal control (.90), treatment control (.74), illness coherence (.89), and emotional representation (.82).

The identity subscale assesses the experience of 14 symptoms: pain, sore throat, nausea, breathlessness, weight loss, fatigue, stiff joints, sore eyes, wheeziness, headaches, upset stomach, sleep difficulties, dizziness, and loss of strength (Moss-Morris et al., 2002). For each symptom, the respondent indicates *yes* or *no* if he or she believes the symptom is the cause of his or her illness. 'Yes' responses are counted and averaged to yield the mean number of symptoms believed to cause the illness. A higher mean score indicates a greater number of symptoms is believed to be attributed to the illness.

The timeline (acute-chronic) subscale assesses perception of the duration of the illness, for example, whether the respondent believes the illness will last a short time or a long time, or is permanent or temporary (Moss-Morris et al., 2002). The timeline (cyclic) subscale assesses perception about the fluctuations of symptoms, for example, "My symptoms come and go in cycles." The consequences subscale assesses perception of illness severity and how it will affect a person's life. The personal control subscale assesses whether the respondent believes he or she has control over the illness, for example, "The course of my illness depends on me." The treatment control subscale assesses whether the respondent believes treatment for the illness will be effective. The illness coherence subscale assesses the respondent's understanding of the illness. Lastly, the emotional representation subscale assesses the respondent's distress about the illness. Response options range from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate strongly held beliefs that the illness will be chronic, illness symptoms will occur often, consequences of the illness will be negative, the illness can be controlled personally, the illness can be treated, a greater understanding of the illness, and the illness causes distress.

In addition to the illness perception measure, sociodemographic and health information were assessed. Sociodemographic information obtained were gender (male or female), race/ethnicity (White, non-Hispanic, Asian, African American or other), employment (retired, employed, or unemployed), education (high school, some college, Bachelor's degree, or graduate degree), and marital status (married/partnered or divorced/widowed). Health information obtained included medications and comorbidities.

Data Analysis

Self-reported data were entered, verified and analyzed using the Statistical Package for Social Sciences for Windows version 23 (IBM, 2015). There were no missing data. Descriptive statistics were calculated to describe illness perception, sociodemographic and health variables. Depending on the number of levels, independent Student *t*-test or analysis of variance statistics were computed to determine differences in illness perception mean scores by sociodemographic characteristics. The alpha level was set at $p \leq .05$, two-tailed, for statistical significance.

Participants

See Table 1 for a summary of the sample's sociodemographic profile. The sample was comprised of 47 men (81%) and 11 women (19%), ranging in age from 65 to 88 years with a mean age of 74 years (*SD* = 6.79). A majority of the sample was White, non-Hispanic (86%), partnered/married (78%), retired (66%), had completed some college or higher level of education (88%), and was born in the US (78%). Participants were prescribed the following categories of medications: statin (71%), beta-blocker (71%), and calcium-channel blocker (21%). Major co-existing health conditions were hypertension (67%), hyperlipidemia (24%), atrial fibrillation (14%), and Type 2 diabetes (19%). Seventeen percent of the sample had no co-existing health conditions.

Table 4.1

Sociodemographic Profile of the Sample (n = 58)

Characteristic	*n*	%
Gender		
Male	47	81.0
Female	11	19.0
Race/Ethnicity		
White, non-Hispanic	59	86.2
Asian	3	5.2
African American	1	1.8
Other	3	5.2
Employment		
Retired	38	65.5
Employed	15	25.9
Unemployed	5	8.6
Education		
High school	7	12.1
Some college	8	13.8
Bachelor’s degree	28	48.3
Graduate degree	15	25.9
Marital Status		
Married/Partnered	45	77.6
Divorced/Widowed	13	22.4

Characteristic	*n*	%
Country of Birth		
Born in the US	45	77.6
Not Born in the US	13	22.4
Medications		
Statins	41	70.7
Beta-blocker	41	70.7
Calcium-channel blocker	12	20.7
Sleeping	5	8.6
Antidepressant	5	8.6
Antianxiety	4	6.9
Comorbidities		
Hypertension	39	67.2
Hyperlipidemia	14	24.1
Diabetes	11	19.0
No comorbidities	10	17.2
Atrial fibrillation	8	13.8

Results

Participants attributed a low mean number of symptoms to CHD (identity) (*M* = 3.19, *SD* = 2.66). Participants' illness perception mean scores indicate they believed CHD would be chronic (timeline acute-chronic) (*M* = 17.36, *SD* = 6.01), CHD symptoms would fluctuate and occur often (timeline cyclic) (*M* = 8.74, *SD* = 3.94), CHD would have negative consequences (consequences) (*M* = 17.72, *SD* = 4.32), and CHD caused distress (emotional representation) (*M* = 15.07, *SD* = 4.50). Despite negative illness perceptions about the duration (timeline acute-chronic), chronicity (timeline cyclic) and distress of CHD (emotional representation), participants believed they could control CHD (personal control) (*M* = 23.03, *SD* = 4.81), CHD could be treated (treatment control) (*M* = 19.57, *SD* = 3.00), and that they understood CHD (illness coherence) (*M* = 19.12, *SD* = 4.36).

Illness perception differed by sociodemographic characteristics (age, employment, marital status, and country of birth). See Tables 2 and 3. There was a statistically significant difference in mean score for personal control by age (*t*(56) = 2.006, *p* = .05), timeline acute-chronic by employment (*F*(2, 55) = 3.209, *p* = .05), identity by marital status (*t*(56) = 2.539, *p* = .01), and timeline cyclical by country of birth (*t*(56) = 2.630, *p* = .01). The correlation between identity and marital status was -.31 (*p* = .02), .27 (*p* = .04) between timeline acute-chronic and employment, -.33 (*p* = .02) between timeline cyclic and country of birth, and -.26 (*p* = .05) between personal control and age. The 65-to-75 year old participants (*M* = 18.14, *SD* = 4.00) believed CHD could be controlled personally as compared to participants aged 76 and older (*M* = 17.05, *SD* = 5.66). As compared to participants who were employed (*M* = 14.20, *SD* = 5.42) or retired (*M* = 18.26, *SD* = 5.66), participants who were unemployed (*M* = 20.00, *SD* = 7.97) believed CHD would last a longer time. Participants who were divorced/widowed (*M* = 4.77, *SD*

= 3.06) reported a greater number of symptoms that they believed were attributed to CHD as compared to married/partnered participants (*M* = 2.73, *SD* = 2.39). Finally, participants who were not born in the US (*M* = 11.15, *SD* = 4.54) as compared to those born in the US believed CHD symptoms would fluctuate and occur often (*M* = 8.04, *SD* = 3.51).

Table 4.2

Illness Perception Mean Scores (Identity, Timeline Acute-Chronic, Timeline Cyclic and Consequences) by Sociodemographic Characteristics of Older Adults Post Coronary Heart Disease Event (n = 58)

		Illness Perception Dimension			
Sociodemographic Characteristic	*n*	Identity	Timeline Acute-Chronic	Timeline Cyclical	Consequences
		M (SD)	*M (SD)*	*M (SD)*	*M (SD)*
Age (years)					*p* = .05
65 to 75	36	2.97 (2.32)	17.58 (6.09)	8.67 (3.88)	18.14 (4.00)
76 and older	22	3.55 (3.17)	17.00 (6.02)	8.86 (4.13)	17.05 (4.83)
Gender					
Male	47	2.98 (2.81)	17.02 (6.10)	8.77 (4.12)	17.49 (4.49)
Female	11	4.09 (1.76)	18.82 (5.72)	8.64 (3.26)	18.73 (3.55)
Race/Ethnicity					
White, non-Hispanic	50	3.22 (2.74)	17.44 (6.00)	8.44 (3.76)	17.60 (4.33)
Non-White	8	3.00 (2.33)	16.88 (6.51)	10.63 (4.81)	18.50 (4.50)
Employment			*p* = .02		
Employed	15	3.47 (3.56)	14.20 (5.42)	7.60 (3.89)	16.53 (5.36)
Unemployed	5	4.00 (1.87)	20.00 (7.97)	11.20 (5.22)	18.20 (4.97)

		Illness Perception Dimension			
			Timeline	Timeline	
Sociodemographic		Identity	Acute-Chronic	Cyclical	Consequences
Characteristic	*n*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Retired	38	2.97 (2.37)	18.26 (5.66)	8.87 (3.74)	18.13 (3.81)
Education					
High school/college	15	2.87 (2.20)	16.67 (6.01)	8.13 (3.64)	17.00 (2.88)
University degree	43	3.30 (2.82)	17.60 (6.07)	8.95 (4.06)	17.98 (4.73)
Marital Status		*p* = .01			
Married/Partnered	45	2.73 (2.39)	17.58 (6.13)	8.84 (4.16)	17.71 (4.29)
Divorced/Widowed	13	4.77 (3.06)	16.62 (5.77)	8.38 (3.23)	17.77 (4.60)
Country of Birth				*p* = .01	
Born in the US	45	3.09 (2.39)	16.98 (5.95)	8.04 (3.51)	17.44 (4.08)
Not born in the US	13	3.54 (3.55)	18.69 (6.30)	11.15 (4.54)	18.69 (5.14)

Table 4.3

Illness Perception Mean Scores (Personal Control, Treatment Control, Illness Coherence and Emotional Representation) by Sociodemographic Characteristics of Older Adults Post Coronary Heart Disease Event (n = 58)

		Illness Perception Dimension			
		Personal Control	Treatment Control	Illness Coherence	Emotional Representation
Sociodemographic Characteristic	*n*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Age (years)		*p* = .05			
65 to 75	36	24.00 (4.82)	19.78 (3.22)	19.56 (4.41)	14.56 (4.63)
76 and older	22	21.45 (4.47)	19.23 (2.65)	18.41 (4.28)	15.91 (4.26)
Gender					
Male	47	23.06 (4.69)	19.72 (2.97)	19.64 (4.36)	14.53 (4.68)
Female	11	22.91 (5.54)	18.91 (3.21)	16.91 (3.81)	17.36 (2.80)
Race/Ethnicity					
White, non-Hispanic	50	22.80 (4.79)	19.36 (2.97)	19.08 (4.39)	14.94 (4.47)
Non-White	8	24.50 (5.01)	20.88 (3.04)	19.38 (4.44)	15.88 (4.94)
Employment					
Employed	15	24.00 (5.96)	20.13 (3.70)	20.40 (4.07)	14.40 (5.34)
Retired	5	22.00 (4.00)	19.40 (3.44)	18.60 (4.16)	17.20 (5.07)
Unemployed	38	22.79 (4.46)	19.37 (2.70)	18.68 (4.50)	15.05 (4.11)
Education					
High school/college	15	23.40 (3.81)	19.80 (2.93)	18.53 (3.98)	15.67 (4.35)
University degree	43	22.91 (5.15)	19.49 (3.06)	19.33 (4.51)	14.86 (4.59)

		Illness Perception Dimension			
		Personal Control	Treatment Control	Illness Coherence	Emotional Representation
Sociodemographic Characteristic	*n*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Marital Status					
Married/Partnered	45	23.00 (5.01)	19.77 (3.17)	19.62 (3.57)	16.31 (3.50)
Divorced/Widowed	13	23.15 (4.22)	19.51 (2.99)	18.98 (4.59)	14.71 (4.73)
Country of Birth					
Born in the US	45	22.87 (4.89)	19.62 (3.06)	19.11 (4.54)	14.82 (4.31)
Not born in the US	13	23.62 (4.68)	19.38 (2.90)	19.15 (3.83)	15.92 (5.20)

Discussion

In this sample of 47 men and 11 women, who were predominantly White, non-Hispanic, aged 65 to 88 years, participants reported a low mean number of symptoms which they believed were attributed to CHD (identity). In general, participants believed their CHD would be chronic (timeline acute-chronic), CHD symptoms would fluctuate and occur often (timeline cyclic), CHD would have negative consequences (consequences), and CHD caused distress (emotional representation). Yet, participants believed they could control CHD (personal control), CHD could be treated (treatment control), and they understood CHD (illness coherence). Social determinants, such as sociodemographic characteristics, appear to shape illness perceptions in older persons with CHD.

Illness perceptions (personal control, timeline acute-chronic, identify, and timeline cyclic) varied by sociodemographic characteristics (age, marital status, employment status, and country of origin). The 65-to75 year old participants reported more personal control of CHD than did participants aged 76 years and older; unemployed participants believed CHD would last a longer time than employed or retired participants; divorced/widowed participants reported a greater number of symptoms they believed were attributed to CHD as compared to married/partnered participants; and, participants who were not born in the US believed CHD symptoms would fluctuate and occur often than did those born in the US.

Although gender difference in illness perception was not found in this study of adults 65 years and older, other researchers have found among persons with CHD, aged 45 to 74 years, men attributed CHD to unhealthy behaviors; whereas, women believed stress caused CHD and perceived more symptoms were associated with CHD, but with less severe consequences (Aalto et al., 2005). In another study of adults, 18 years and older, with acute coronary syndrome, women believed CHD would last longer and fluctuate and change more often than did men; whereas, men believed they could control CHD, which they also believed could be treated (Grace et al., 2005). Traditional gender roles and responsibilities may explain the gender difference in illness perception.

Besides gender, literature could not be found that examined the influence of country of birth, marital status, race/ethnicity, employment, education, and other social determinants of health in the older adult population post-CHD event. This limited knowledge is a major gap in the literature for this population, who are more at-risk to have a CHD event (Heidenreich et al., 2011; Keib et al., 2010). Social determinants shape people's perceptions of health and illness (Marmot, 2005) and could lead to health disparities (Institute of Medicine, 2003). In conditions other than CHD, racial and ethnic differences in illness perceptions have been documented between Black-Africans and Whites with Type 2 diabetes in the United Kingdom (Abubakari et al., 2013), between Korean Americans and African Americans receiving hemodialysis for endstage renal disease (Kim, Evangelista, Phillips, Pavlish, & Kopple, 2012), and among African Americans in an intensive care unit of a hospital in North Carolina (Ford, Zapka, Gebregziabher, Yang, & Sterba, 2010).

In the literature, illness perceptions and sociodemographic characteristics have been shown to affect interest in, attendance to and completion of cardiac rehabilitation after a CHD event. Modifying illness perceptions, in particular personal control, identity and understanding of CHD, have been shown to improve post-CHD event recovery and cardiac rehabilitation completion (Aalto, Heijmans, Weinman, & Aro, 2005; Aalto et al., 2006; Alsen et al. 2010; Blair et al., 2014; Petrie, Cameron, Ellis, Buick, & Weinman, 2002; Whitmarsh, Koutantji, & Sidell, 2003). Younger age and being employed have been found to be associated with lower completion of cardiac rehabilitation (Cooper, Lloyd, Weinman, & Jackson, 1999; De Vos et al., 2013; Heydarpour, Saeidi, Ezzati, Soroush, & Komasi, 2015; Mikkelsen, Korsgaard Thomsen, & Tchijevitch, 2014; Yohannes, Yalfani, Doherty, & Bundy, 2007). In contrast, other researchers have found younger age to be associated with higher cardiac rehabilitation completion (French, Lewin, Watson, & Thompson, 2014; Herman et al., 2014). Being retired or unemployed (Hagan, Botti, & Watts, 2007) and being female (Herman et al., 2014; Yohannes et al., 2007) have been associated with lower cardiac rehabilitation completion. Level of education and race/ethnicity have also been found to be associated with cardiac rehabilitation attendance (Herman et al., 2014).

Limitations

Not having a comparison group of older adults who were not participating in cardiac rehabilitation was a limitation of this descriptive, cross-sectional study. Sociodemographic and illness perception differences may have varied by cardiac rehabilitation attendance. Other study limitations include the small sample size and nonprobability convenience sample that was relatively homogenous. With a larger sample, gender and racial/ethnic differences in illness perceptions may have been found. Because of cultural beliefs, different racial and ethnic groups may have beliefs about a specific health condition that influence the ways in which they self-regulate. Recruitment occurred in two cardiac rehabilitation centers located in a specific regional, geographic location. Data were self-reported and collected at one point in time and did not allow for observing changes in illness perceptions over time during cardiac rehabilitation. Study limitations restrict generalization of the findings. This study, however, is one of the few studies conducted in the US that explored differences in illness perceptions by sociodemographic characteristics in the older adult population participating in cardiac rehabilitation following a CHD event.

Conclusions, Implications and Recommendations

Older adults attending a cardiac rehabilitation program after a CHD event believed that CHD could be treated, they could control CHD, and had a good understanding of CHD; however, a majority of them also believed their illness was chronic, would fluctuate and occur often, would have negative consequences, and reported CHD caused them distress. Sociodemographic characteristics should be taken into consideration when assessing illness perceptions. Personal control, timeline acute-chronic, identity and timeline cyclic illness perceptions varied depending on age, marital status, employment and country of birth. Cardiac rehabilitation nurses should screen for illness perceptions early during the intake phase, noting participants' sociodemographic characteristics; and then, tailor and modify interventions accordingly, which may result in increased completion of cardiac rehabilitation—an illness prevention and health promotion behavior.

Many of the studies in the literature lacked analysis based on sociodemographic characteristics. Further research that is longitudinal with a larger, heterogeneous sample and comparison group who did not attend cardiac rehabilitation is recommended in order to understand better the illness perceptions and sociodemographic factors that influence the interest, participation, completion and effectiveness of cardiac rehabilitation in the older adult population with the goal of improving health outcomes and quality of life for older adults who have experienced a CHD event. Moreover, changes in illness perceptions over time need to be assessed. Targeted or tailored cardiac rehabilitation interventions based on a population's sociodemographic profile, such as gender, race/ethnicity, or born or not born in the US, should be tested for efficacy. Subgroup comparisons might provide a better understanding of the unique needs of specific populations or sociodemographic profiles in order to intervene appropriately, hopefully, resulting in minimal disparity in post-CHD event health outcomes.

References

Aalto, A. M., Heijmans, M., Weinman, J., & Aro, A. R. (2005). Illness perceptions in coronary heart disease. Sociodemographic, illness-related, and psychosocial correlates. *Journal of Psychosomatic Research*, *58*, 393-402.

Aalto, A. M., Aro, A. R., Weinman, J., Heijmans, M., Manderbacka, K., & Elovainio, M. (2006). Sociodemographic, disease status, and illness perceptions predictors of global self-ratings of health and quality of life among those with coronary heart disease: One year follow-up study. *Quality of Life Research*, *15*, 1307-1322.

Abubakari, A.-R., Jones, M. C., Lauder, W., Kirk, A., Anderson, J., Devendra, D., & Naderali, E. K. (2013). Ethnic differences and socio-demographic predictors of illness perceptions, self-management, and metabolic control of type 2 diabetes. *International Journal of General Medicine*, *6*, 617-628. doi: http://doi.org/10.2147/IJGM.S46649

Alsen, P., Brink, E., Persson, L. O., Brandstrom, Y., & Karlson, B. W. (2010). Illness perceptions after myocardial infarction relations to fatigue, emotional distress, and health-related quality of life. *Journal of Cardiovascular Nursing, 25*, E1-E10. doi: 10.1097/JCN.0b013e3181c6dcfd

American Hospital Association. First Consulting Group. (2007). *When I'm 64: How boomers will change health care*. Chicago: American Hospital Association.

Blair, J., Angus, N. J., Lauder, W. J., Atherton, I., Evans, J., & Leslie, S. J. (2014). The influence of non-modifiable illness perceptions on attendance at cardiac rehabilitation. *European Journal of Cardiovascular Nursing*, *13,* 55-62. doi:10.1177/1474515113477272

Cooper, A., Lloyd, G., Weinman, J., & Jackson, G. (1999). Why patients do not attend cardiac rehabilitation: role of intentions and illness beliefs. *Heart, 82*, 234-236. doi: 10.1136/hrt.82.2.234

De Melo Ghisi, G. L., Polyzotis, p., Oh, P., Pakosh, M., & Grace, S. L. (2013). Physician factors affecting cardiac rehabilitation referral and patient enrollment: a systemic review. *Clinical Cardiology*, *35*, 323-335. doi: 10.1002/clc.22126

De Vos, C., Li, X., Van Vlaenderen, I., Saka, O., Dendale, P., Eyssen, M., & Paulus, D. (2013). Participating or not in a cardiac rehabilitation programme: Factors influencing a patient's decision. *European Journal of Preventive Cardiology*, *20,* 341-348. doi: 10.1177/2047487312437057

Dickens, C., McGowan, L., Percival, C., Tomenson, B., Cotter, L., Heagerty, A., & Creed, F. (2008). Negative illness perceptions are associated with new-onset depression following myocardial infarction. *General Hospital Psychiatry, 30,* 414-420. doi: 10.1016/j.genhosppsych.2008.04.003

Ford, D., Zapka, J., Gebregziabher, M., Yang, C., & Sterba, K. (2010). Factors associated with illness perception among critically ill patients and surrogates. *Chest*, *138*, 59-67. doi:10.1378/chest.09-2124

French, D. P., Lewin, R.J.P., Watson, N., & Thompson, D.R. (2005). Do illness perceptions predict attendance at cardiac rehabilitation and quality of life following myocardial infarction? *Journal of Psychosomatic Research*, *59,* 315-322.

Grace, S. L., Krepostman, S., Brooks, D., Arthur, H., Scholey, P., Suskin, N.,…Stewart, D. E. (2005). Illness perceptions among cardiac patients: Relation to depressive symptomatology and sex. *Journal of Psychosomatic Research, 59,* 153-160. doi: 10.1016/j.jpsychores.2005.05.005

Hagan, N., Botti, M., & Watts, R. (2007). Financial, family, and social factors impacting on cardiac rehabilitation attendance. *Heart & Lung, 36*, 105-113.

Heidenreich, P. A., Trogdon, J. G., Khavjou, O. A. et al. (2011). Forecasting the future of cardiovascular disease in the United States: A policy statement from the American Heart Association. *Circulation, 123*, 933-944. doi:10.1161/CIR.0b013e31820a55f5

Herman, R., Liebergall, M., & Rott, D. (2014). Correlation between participation in a cardiac rehabilitation program and quality of life of patients with coronary artery disease. *Rehabilitation Nursing, 39,* 192-197 6p. doi:10.1002/rnj.118

Heron, M. (2012). Deaths: Leading causes for 2008. *National Statistics Reports, 60,* 1-94.

Heydarpour, B., Saeidi, M., Ezzati, P., Soroush, A., & Komasi, S. (2015). Sociodemographic predictors in failure to complete outpatient cardiac rehabilitation. *Annals of Rehabilitation Medicine, 39*, 863-871. doi: http://doi.org/10.5535/arm.2015.39.6.863

IBM Corporation (2015). *IBM SPSS Statistics*. Somers, NY: author.

Institute of Medicine. (2003). *Unequal treatment. Confronting racial and ethnic disparities in health care*. Washington, DC: The National Academies Press.

Keib, C. N., Reynolds, N. R., & Ahijevych, K. L. (2010). Poor use of cardiac rehabilitation among older adults: a self-regulatory model for tailored interventions. *Heart Lung, 39*, 504-511. doi: 10.1016/j.hrtlng.2009.11.006

Kim, Y., Evangelista, L. S., Phillips, L. R., Pavlish, C., & Kopple, J. D. (2012). Racial/ethnic differences in illness perceptions in minority patients undergoing maintenance hemodialysis. *Nephrology Nursing Journal, 39*, 39-49.

Lau-Walker, M. (2006). A conceptual care model for individualized care approach in cardiac rehabilitation--combining both illness representation and self-efficacy. *British Journal of Health Psychology, 11*, 103-117. doi: 10.1348/135910705X41914

Lau-Walker, M. (2007). Importance of illness beliefs and self-efficacy for patients with coronary heart disease. *Journal of Advanced Nursing*, *60,* 187-198. doi: 10.1348/135910705X41914

Lau-Walker, M. O., Cowie, M. R., & Roughton, M. (2009). Coronary heart disease patients' perception of their symptoms and sense of control are associated with their quality of life three years following hospital discharge. *Journal of Clinical Nursing, 18*, 63-71. doi: 10.1111/j.1365-2702.2008.02386

Leventhal, H., Diefenbach, M., & Leventhal, E. (1992). Illness cognition: Using common-sense to understand treatment adherence and affect cognition interactions. *Cognitive Therapy and Research, 16*, 143-163. doi:10.1007/BF01173486

Marmot, M. (2005). Social determinants of health inequalities. *Lancet, 365,* 1099-1104.

Meyer, D., Leventhal, H., & Gutmann, M. (1985). Common-sense models of illness: The example of hypertension. *Health Psychology*, 4, 115-135.

Mikkelsen, T., Korsgaard Thomsen, K., & Tchijevitch, O. (2014). Non-attendance and drop-out in cardiac rehabilitation among patients with ischaemic heart disease. *Danish Medical Journal, 61*, A4919-A4923.

Moss-Morris, R., Weinman, J., Petrie, K. J., Horne, R., Cameron, L. D., & Buick, D. (2002). The revised illness perception questionnaire (IPQ-R). *Psychology and Health, 17*, 1-16.

Petrie, K. J., Cameron, L. D., Ellis, C. J., Buick, D. & Weinman, J. (2002). Changing illness perceptions after myocardial infarction: an early intervention randomized controlled trial. *Psychosomatic Medicine*, *64,* 580-586.

Roger, V. L., Go, A. S. Lloyd-Jones, D. M., Benjamin, E. J., Berry, J. D., Borden, W. B…et al. (2012). Heart disease and stroke statistics—2012 update: A report from the American Heart Association. *Circulation, 125,* e2–220. doi: 10.1161/CIR.0b013e31823ac046

Stafford, L., Berk, M., & Jackson, H. J. (2008). Are illness perceptions about coronary artery disease predictive of depression and quality of life outcomes? *Journal of Psychosomatic Research*, 66, 211-220. doi: 10.1016/j.jpsychores.2008.09.005.

Steca, P., Greco, A., Monzani, D., Politi, A., Gestra, R., Ferrari, G.,…Parati, G. (2013). How does illness severity influence depression, health satisfaction and life satisfaction in patients with cardiovascular disease? The mediating role of illness perception and self efficacy beliefs. *Psychology & Health, 28*, 765-783. doi: 10.1080/08870446.2012.759223

Whitmarsh, A., Koutantji, M., & Sidell, K. (2003). Illness perceptions, mood and coping in predicting attendance at cardiac rehabilitation. *British Journal of Health Psychology, 8,* 209-221 13p. doi:10.1348/135910703321649178

Yohannes, A. M., Yalfani, A., Doherty, P., & Bundy, C. (2007). Predictors of drop-out from an outpatient cardiac rehabilitation programme. *Clinical Rehabilitation, 21,* 222-229. doi: 10.1177/0269215506070771

CHAPTER V

DISCUSSION

Summary

The purpose of this dissertation research was threefold: (a) conduct a literature review in order to describe and identify gaps in the literature related to illness perception and its impact on older adults who have CHD; (b) guided by Leventhal's self-regulation theory, examine the relationship between illness perception, depression, anxiety and health-related quality of life (HRQOL) among older adults who have experienced a CHD event; and (c) describe the illness perceptions of older adults participating in cardiac rehabilitation post-CHD event, taking into consideration sociodemographic characteristics. The literature indicates consensus that illness perception and its multiple dimensions are associated with post-CHD depression, anxiety and HRQOL, but there remains disagreement on which specific aspects of illness perception are the least and most influential. This difference may be related to the lack of a uniform conceptualization of illness perception. Operationalization of illness perception is primarily assessed with the Illness Perception Questionnaire although other measures to assess illness perception were found in the literature (Furze, 2005; Gallagher, 2009). Furthermore, there is a gap in the literature related to illness perception in adults, 65 years and older, and whether illness perception varies by the social determinants of health, specifically sociodemographic characteristics, for this population. As people age, illness perception can change because of life experiences (Diefenbach & Leventhal, 1996).

This dissertation study, guided by Leventhal's self-regulation theory, revealed illness perception influenced anxiety and depressive symptomatology and mental and physical HRQOL, and illness perception differed based on sociodemographic characteristics among the convenience sample of 58, which was comprised of 47 men and 11 women. Recruited from cardiac rehabilitation centers in the San Francisco Bay Area, participants ranged in age from 65 to 88 years with a mean age of 74 years. They responded to the Hospital Anxiety and Depression Scale, the Illness Perception Questionnaire Revised, and the RAND 36-item Health Survey to measure HRQOL. In addition, sociodemographic and health data were collected. A majority of the sample was White, non-Hispanic, partnered/ married, retired, had completed some college or higher level of education, and was born in the United States (US). Participants were prescribed the following categories of medications: statin, beta-blocker, and calcium-channel blocker. Major co-existing health conditions were hypertension, hyperlipidemia, atrial fibrillation, and Type 2 diabetes.

In general, participants believed their CHD would be chronic (timeline acute-chronic), CHD symptoms would fluctuate and occur often (timeline cyclic), CHD would have negative consequences (consequences), and CHD caused distress (emotional representation). Yet, participants believed they could control CHD (personal control), CHD could be treated (treatment control), and they understood CHD (illness coherence). Participants were low risk for anxiety and depression and had above average mental and physical HRQOL. Varying dimensions of illness perception contributed significantly to the variance in depression, anxiety and HRQOL. Participants with more depressive symptomatology believed CHD did not have negative consequences, those with more anxiety symptoms believed CHD caused distress, and those with better mental and physical HRQOL attributed a lower number of symptoms to CHD.

Social determinants, such as sociodemographic characteristics, appear to shape illness perceptions in older persons with CHD. Statistically significant differences in illness perceptions varied by sociodemographic characteristics. The 65-to-75 year old adults believed CHD could be personally controlled more than adults aged 76 and older. As compared to participants who were employed or retired, those who were unemployed believed CHD would last a longer time. Divorced/widowed participants reported a greater number of symptoms that they believed were attributed to CHD as compared to married/partnered participants. As compared to participants born in the US, participants not born in the US believed CHD symptoms would fluctuate and occur often.

Conclusions

Older adults participating in a phase II cardiac rehabilitation program exhibited mainly positive illness perceptions; they understood CHD, believed CHD could be controlled, and believed CHD could be treated. Participants, however, had negative illness perceptions about the duration, chronicity and distress of CHD. Positive illness perceptions appear to be related to less anxiety and depressive symptomatology and better mental and physical functioning. The older adults in this study seemed well-adjusted and evidenced few symptoms of depression and anxiety, suggesting participating in cardiac rehabilitation may have helped them to learn positive coping strategies, which they used to deal with the experience of CHD. Sociodemographic characteristics should be taken into consideration when assessing illness perceptions. In this study, illness perceptions (personal control, timeline acute-chronic, identify, and timeline cyclic) varied by sociodemographic characteristics (age, marital status, employment status, and country of origin). The illness perception literature on older adults post-CHD, participating in cardiac rehabilitation, is sparse in the US. This study is one of the few studies that explored the relationship between illness perceptions and depression, anxiety, HRQOL, and sociodemographic characteristics in the older adult population post-CHD.

Limitations

Not having a comparison group of older adults who were not participating in cardiac rehabilitation was a limitation of this descriptive, cross-sectional study. This study design, however, has been commonly used among cardiovascular researchers to examine similar variables in similar populations because there are fewer attrition issues and the design is efficient for gathering information from hard-to-reach populations at a specific point in time (Alsen, Brink, Persson, Brandstrom, & Karlson, 2010; Dickens et al., 2008; Grace et al., 2005; Juergens, Seekatz, Moosdorf, Petrie, & Rief, 2010; Steca et al., 2013; Stafford et al., 2008). Sociodemographic and illness perception differences may have varied by cardiac rehabilitation attendance. Other study limitations include the small sample size and nonprobability convenience sample that was relatively homogenous. With a larger sample, gender and racial/ethnic differences in illness perceptions may have been found. Because of cultural beliefs, different racial and ethnic groups may have beliefs about a specific health condition that influence the ways in which they self-regulate. Recruitment occurred in two cardiac rehabilitation centers located in a specific regional, geographic location. Data were self-reported and collected at one point in time and did not allow for observing changes in illness perceptions over time during cardiac rehabilitation. Moreover, causality between illness perception and depression and anxiety symptoms and mental and physical HRQOL could not be established. Study limitations restrict generalization of the findings.

Implications for Health and Nursing

Study findings highlight the importance of cardiac rehabilitation nurses intervening to address older adults’ illness perception and its effect on emotional, psychological and physical health and wellbeing post-CHD event. This targeted focus should include addressing identity (number of symptoms attributable to CHD), which appears to contribute significantly to better mental and physical health functioning. In addition, addressing the illness perception beliefs that CHD will have negative consequences and will cause distress may help to minimize depression and anxiety symptoms in older adults following a CHD event.

Secondary and tertiary prevention interventions for older adults with CHD should involve the illness perception concept in order to understand how older people experience and manage illness in order to help this population develop coping strategies and skills to adopt behaviors that will optimize health. There is a need to screen, assess and manage illness perceptions in the plan of care prior to discharge from the hospital to cardiac rehabilitation and to intervene early with age-specific cognitive reframing approaches to improve recovery, health outcomes, wellbeing and functioning of older adults after a CHD event. Furthermore, cardiac rehabilitation nurses should note participants’ sociodemographic characteristics, which they could use to tailor and modify interventions accordingly, which may result in increased completion of cardiac rehabilitation—an illness prevention and health promotion behavior.

Recommendations for Further Research

Many of the studies in the literature lacked analysis based on sociodemographics, including gender, age, race/ethnicity, country of birth, among others, particulary in the US. Social determinants influence health, health outcomes, health disparities, health beliefs, and illness perceptions (Marmot, 2008). Further research that is longitudinal with a larger, heterogeneous sample and comparison group who did not attend cardiac rehabilitation is recommended in order to understand better the illness perceptions and sociodemographic factors that influence the interest, participation, completion and effectiveness of cardiac rehabilitation in the older adult population with the goal of improving health outcomes and quality of life for older adults who have experienced a CHD event. Moreover, changes in illness perceptions over time need to be assessed. Targeted or tailored cardiac rehabilitation interventions based on a population’s sociodemographic profile, such as gender, race/ethnicity, or born or not born in the US, should be tested for efficacy. Subgroup comparisons might provide a better understanding of the unique needs of specific populations or sociodemographic profiles in order to intervene appropriately, hopefully, resulting in minimal disparity in post-CHD event health outcomes.

References

Alsen, P., Brink, E., Persson, L. O., Brandstrom, Y., & Karlson, B. W. (2010). Illness Perceptions After Myocardial Infarction Relations to Fatigue, Emotional Distress, and Health-Related Quality of Life. *Journal of Cardiovascular Nursing, 25* (2), E1-E10. doi: 10.1097/JCN.0b013e3181c6dcfd

Dickens, C., McGowan, L., Percival, C., Tomenson, B., Cotter, L., Heagerty, A., & Creed, F. (2008). Negative illness perceptions are associated with new-onset depression following myocardial infarction. *General Hospital Psychiatry, 30* (5), 414-420. doi: 10.1016/j.genhosppsych.2008.04.003

Diefenbach, M.A, & Leventhal, H. (1996). The common sense model of illness representation: theoretical and practical considerations. *Journal of Social Distress and Homeless*, *5*(1), 11-38.

Furze, G., Lewin, R. J., Murberg, T., Bull, P., & Thompson, D. R. (2005). Does it matter what patients think? The relationship between changes in patients' beliefs about angina and their psychological and functional status. *Journal of Psychosomatic Research, 59*(5), 323-329. doi: 10.1016/j.jpsychores.2005.06.071

Gallagher, R., & McKinley, S. (2009). Anxiety, depression and perceived control in patients having coronary artery bypass grafts. *Journal of Advanced Nursing*, *65*(11), 2386-2396. doi: 10.1111/j.1365-2648.2009.05101

Grace, S. L., Krepostman, S., Brooks, D., Arthur, H., Scholey, P., Suskin, N.,…Stewart, D. E. (2005). Illness perceptions among cardiac patients: relation to depressive symptomatology and sex. *Journal of Psychosomatic Research, 59* (3), 153-160. doi: 10.1016/j.jpsychores.2005.05.005

Juergens, M. C., Seekatz, B., Moosdorf, R. G., Petrie, K. J., & Rief, W. (2010). Illness beliefs before cardiac surgery predict disability, quality of life, and depression 3 months later. *Journal of Psychosomatic Research, 68* (6), 553-560. doi: 10.1016/ j.jpsychores.2009.10.004

Marmot, M. (2005). Social determinants of health inequalities. *Lancet, 365,* 1099-1104.

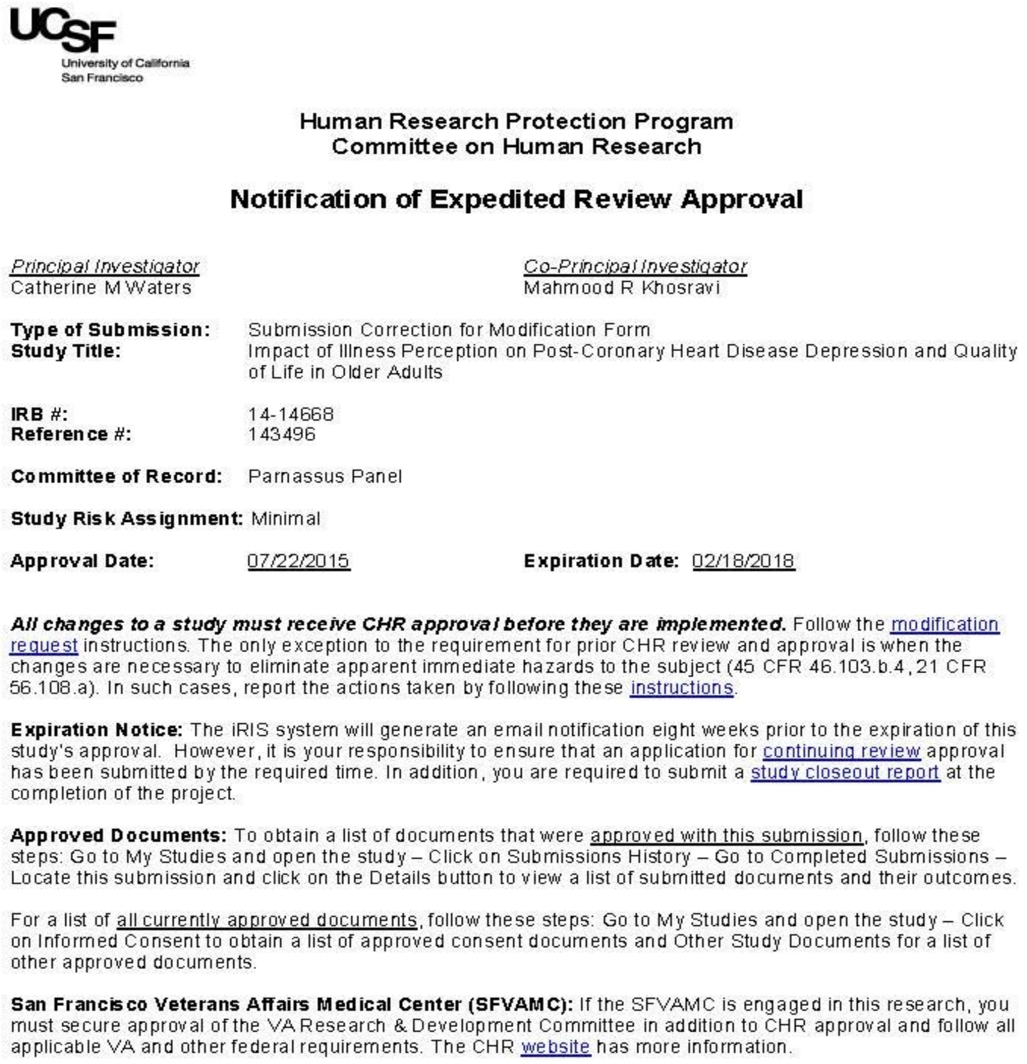
Stafford, L., Berk, M., & Jackson, H. J. (2008). Are illness perceptions about coronary artery disease predictive of depression and quality of life outcomes? *Journal of Psychosomatic Research*, 66 (3), 211-220. doi: 10.1016/j.jpsychores.2008.09.005.

Steca, P., Greco, A., Monzani, D., Politi, A., Gestra, R., Ferrari, G.,…Parati, G. (2013). How does illness severity influence depression, health satisfaction and life satisfaction in patients with cardiovascular disease? The mediating role of illness perception and self-efficacy beliefs. *Psychology & Health, 28* (7), 765-783. doi: 10.1080/08870446.2012.759223

Appendix A

University of California, San Francisco

Committee on Human Research Approval Letter



UCSF
University of California
San Francisco

Human Research Protection Program
Committee on Human Research

Notification of Expedited Review Approval

Principal Investigator	*Co-Principal Investigator*
Catherine M Waters	Mahmood R Khosravi

Type of Submission: Submission Correction for Modification Form
Study Title: Impact of Illness Perception on Post-Coronary Heart Disease Depression and Quality of Life in Older Adults

IRB #: 14-14668
Reference #: 143496

Committee of Record: Parnassus Panel

Study Risk Assignment: Minimal

Approval Date: 07/22/2015 **Expiration Date:** 02/18/2018

All changes to a study must receive CHR approval before they are implemented. Follow the modification request instructions. The only exception to the requirement for prior CHR review and approval is when the changes are necessary to eliminate apparent immediate hazards to the subject (45 CFR 46.103.b.4, 21 CFR 56.108.a). In such cases, report the actions taken by following these instructions.

Expiration Notice: The iRIS system will generate an email notification eight weeks prior to the expiration of this study's approval. However, it is your responsibility to ensure that an application for continuing review approval has been submitted by the required time. In addition, you are required to submit a study closeout report at the completion of the project.

Approved Documents: To obtain a list of documents that were approved with this submission, follow these steps: Go to My Studies and open the study – Click on Submissions History – Go to Completed Submissions – Locate this submission and click on the Details button to view a list of submitted documents and their outcomes.

For a list of all currently approved documents, follow these steps: Go to My Studies and open the study – Click on Informed Consent to obtain a list of approved consent documents and Other Study Documents for a list of other approved documents.

San Francisco Veterans Affairs Medical Center (SFVAMC): If the SFVAMC is engaged in this research, you must secure approval of the VA Research & Development Committee in addition to CHR approval and follow all applicable VA and other federal requirements. The CHR website has more information.

Appendix B

Hospital Anxiety and Depression Scale

Hospital Anxiety and Depression Scale (HADS)

Tick the box beside the reply that is closest to how you have been feeling in the past week.
Don't take too long over you replies: your immediate is best.

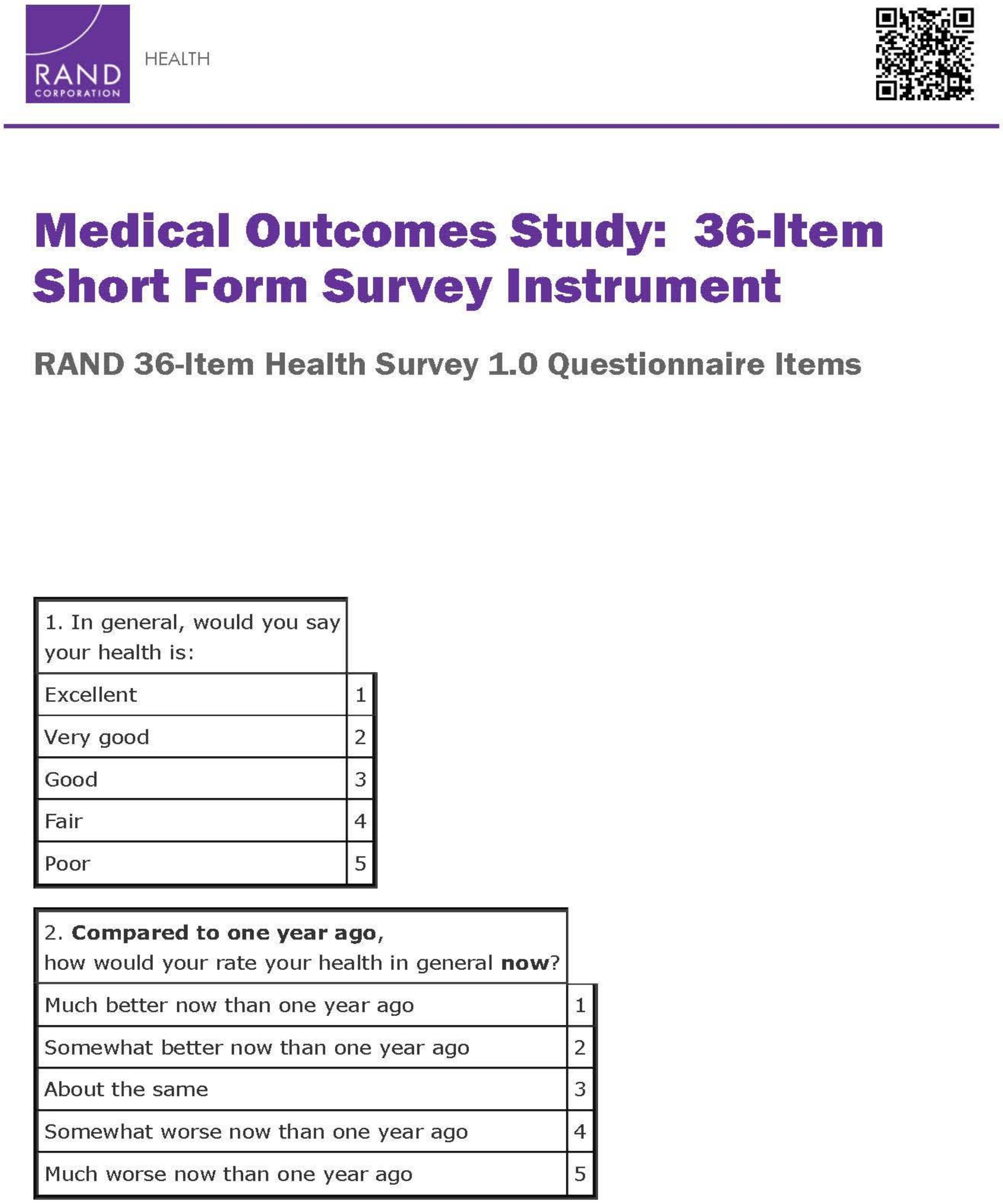
D	A		D	A	
		I feel tense or 'wound up':			**I feel as if I am slowed down:**
	3	Most of the time	3		Nearly all the time
	2	A lot of the time	2		Very often
	1	From time to time, occasionally	1		Sometimes
	0	Not at all	0		Not at all
		I still enjoy the things I used to enjoy:			**I get a sort of frightened feeling like 'butterflies' in the stomach:**
0		Definitely as much		0	Not at all
1		Not quite so much		1	Occasionally
2		Only a little		2	Quite Often
3		Hardly at all		3	Very Often
		I get a sort of frightened feeling as if something awful is about to happen:			**I have lost interest in my appearance:**
	3	Very definitely and quite badly	3		Definitely
	2	Yes, but not too badly	2		I don't take as much care as I should
	1	A little, but it doesn't worry me	1		I may not take quite as much care
	0	Not at all	0		I take just as much care as ever
		I can laugh and see the funny side of things:			**I feel restless as I have to be on the move:**
0		As much as I always could		3	Very much indeed
1		Not quite so much now		2	Quite a lot
2		Definitely not so much now		1	Not very much
3		Not at all		0	Not at all
		Worrying thoughts go through my mind:			**I look forward with enjoyment to things:**
	3	A great deal of the time	0		As much as I ever did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time, but not too often	2		Definitely less than I used to
	0	Only occasionally	3		Hardly at all
		I feel cheerful:			**I get sudden feelings of panic:**
3		Not at all		3	Very often indeed
2		Not often		2	Quite often
1		Sometimes		1	Not very often
0		Most of the time		0	Not at all
		I can sit at ease and feel relaxed:			**I can enjoy a good book or radio or TV program:**
	0	Definitely	0		Often
	1	Usually	1		Sometimes
	2	Not Often	2		Not often
	3	Not at all	3		Very seldom

Please check you have answered all the questions

Scoring:
Total score: Depression (D) ___________ Anxiety (A) ______________
0-7 = Normal
8-10 = Borderline abnormal (borderline case)
11-21 = Abnormal (case)

Appendix C

RAND 36-Item Health Survey



RAND CORPORATION HEALTH

Medical Outcomes Study: 36-Item Short Form Survey Instrument

RAND 36-Item Health Survey 1.0 Questionnaire Items

1. In general, would you say your health is:	
Excellent	1
Very good	2
Good	3
Fair	4
Poor	5

2. **Compared to one year ago,** how would your rate your health in general **now**?	
Much better now than one year ago	1
Somewhat better now than one year ago	2
About the same	3
Somewhat worse now than one year ago	4
Much worse now than one year ago	5

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

(Circle One Number on Each Line)

	Yes, Limited a Lot	Yes, Limited a Little	No, Not limited at All
3. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	[1]	[2]	[3]
4. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	[1]	[2]	[3]
5. Lifting or carrying groceries	[1]	[2]	[3]
6. Climbing **several** flights of stairs	[1]	[2]	[3]
7. Climbing **one** flight of stairs	[1]	[2]	[3]
8. Bending, kneeling, or stooping	[1]	[2]	[3]
9. Walking **more than a mile**	[1]	[2]	[3]
10. Walking **several blocks**	[1]	[2]	[3]
11. Walking **one block**	[1]	[2]	[3]
12. Bathing or dressing yourself	[1]	[2]	[3]

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

(Circle One Number on Each Line)

	Yes	No
13. Cut down the amount of time you spent on work or other activities	1	2
14. **Accomplished less** than you would like	1	2
15. Were limited in the **kind** of work or other activities	1	2

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

(Circle One Number on Each Line)

	Yes, Limited a Lot	Yes, Limited a Little	No, Not limited at All
3. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	[1]	[2]	[3]
4. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	[1]	[2]	[3]
5. Lifting or carrying groceries	[1]	[2]	[3]
6. Climbing **several** flights of stairs	[1]	[2]	[3]
7. Climbing **one** flight of stairs	[1]	[2]	[3]
8. Bending, kneeling, or stooping	[1]	[2]	[3]
9. Walking **more than a mile**	[1]	[2]	[3]
10. Walking **several blocks**	[1]	[2]	[3]
11. Walking **one block**	[1]	[2]	[3]
12. Bathing or dressing yourself	[1]	[2]	[3]

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

(Circle One Number on Each Line)

	Yes	No
13. Cut down the amount of time you spent on work or other activities	1	2
14. **Accomplished less** than you would like	1	2
15. Were limited in the **kind** of work or other activities	1	2

Severe 5

Very severe 6

22. During the **past 4 weeks,** how much did **pain** interfere with your normal work (including both work outside the home and housework)?

(Circle One Number)

Not at all 1

A little bit 2

Moderately 3

Quite a bit 4

Extremely 5

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks** . . .

(Circle One Number on Each Line)

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
23. Did you feel full of pep?	1	2	3	4	5	6
24. Have you been a very nervous person?	1	2	3	4	5	6
25. Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
26. Have you felt calm and peaceful?	1	2	3	4	5	6
27. Did you have a lot of energy?	1	2	3	4	5	6
	1	2	3	4	5	6

28. Have you felt downhearted and blue?						
29. Did you feel worn out?	1	2	3	4	5	6
30. Have you been a happy person?	1	2	3	4	5	6
31. Did you feel tired?	1	2	3	4	5	6

32. During the **past 4 weeks,** how much of the time has your **physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

(Circle One Number)

All of the time 1

Most of the time 2

Some of the time 3

A little of the time 4

None of the time 5

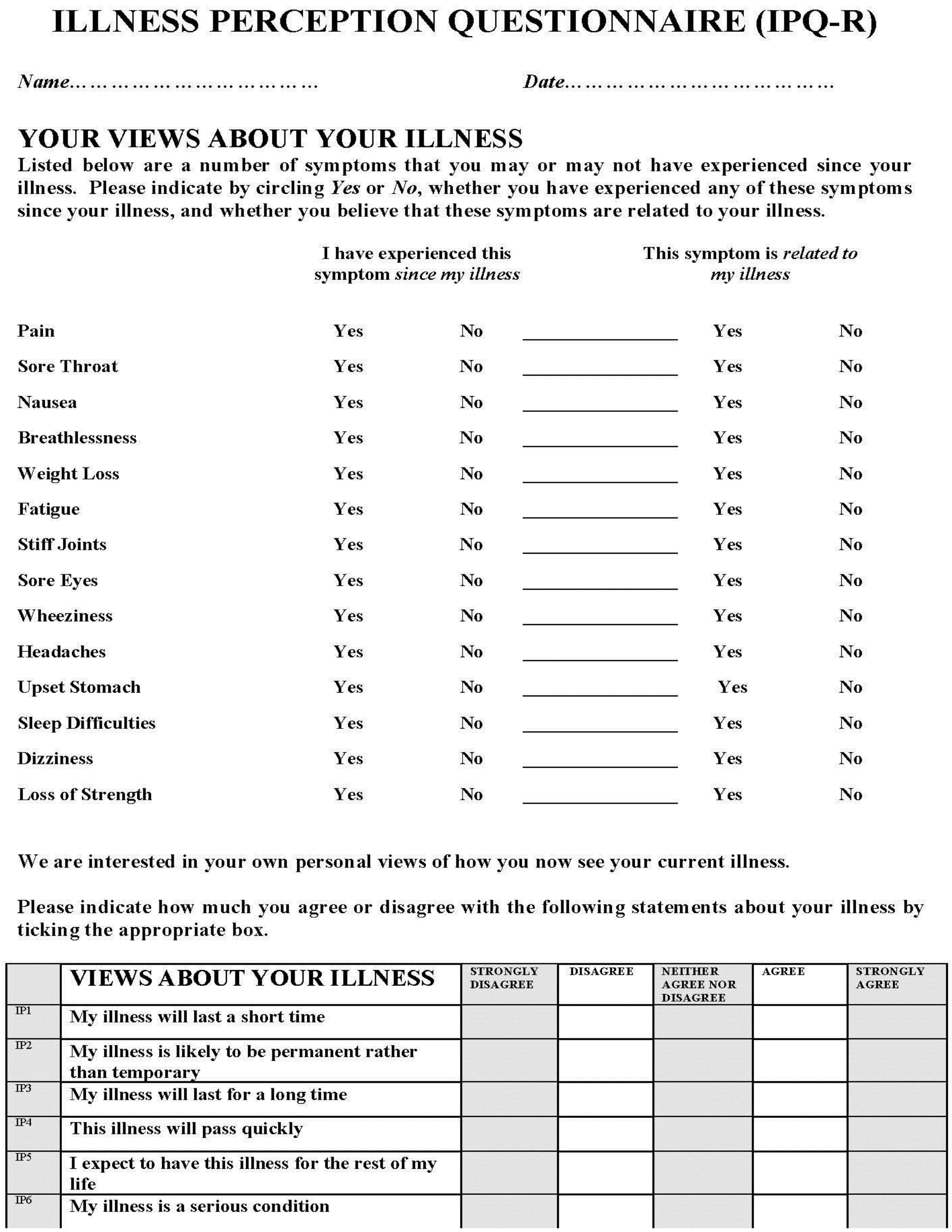
How TRUE or FALSE is <u>each</u> of the following statements for you.

(Circle One Number on Each Line)

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
33. I seem to get sick a little easier than other people	1	2	3	4	5
34. I am as healthy as anybody I know	1	2	3	4	5
35. I expect my health to get worse	1	2	3	4	5
36. My health is excellent	1	2	3	4	5

Appendix D

Illness Perception Questionnaire – Revised



ILLNESS PERCEPTION QUESTIONNAIRE (IPQ-R)

Name…………………………………… *Date……………………………………*

YOUR VIEWS ABOUT YOUR ILLNESS

Listed below are a number of symptoms that you may or may not have experienced since your illness. Please indicate by circling *Yes* or *No*, whether you have experienced any of these symptoms since your illness, and whether you believe that these symptoms are related to your illness.

	I have experienced this symptom *since my illness*			This symptom is *related to my illness*	
Pain	Yes	No	________________	Yes	No
Sore Throat	Yes	No	________________	Yes	No
Nausea	Yes	No	________________	Yes	No
Breathlessness	Yes	No	________________	Yes	No
Weight Loss	Yes	No	________________	Yes	No
Fatigue	Yes	No	________________	Yes	No
Stiff Joints	Yes	No	________________	Yes	No
Sore Eyes	Yes	No	________________	Yes	No
Wheeziness	Yes	No	________________	Yes	No
Headaches	Yes	No	________________	Yes	No
Upset Stomach	Yes	No	________________	Yes	No
Sleep Difficulties	Yes	No	________________	Yes	No
Dizziness	Yes	No	________________	Yes	No
Loss of Strength	Yes	No	________________	Yes	No

We are interested in your own personal views of how you now see your current illness.

Please indicate how much you agree or disagree with the following statements about your illness by ticking the appropriate box.

	VIEWS ABOUT YOUR ILLNESS	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
IP1	My illness will last a short time					
IP2	My illness is likely to be permanent rather than temporary					
IP3	My illness will last for a long time					
IP4	This illness will pass quickly					
IP5	I expect to have this illness for the rest of my life					
IP6	My illness is a serious condition					

	VIEWS ABOUT YOUR ILLNESS	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
IP7	**My illness has major consequences on my life**					
IP8	**My illness does not have much effect on my life**					
IP9	**My illness strongly affects the way others see me**					
IP10	**My illness has serious financial consequences**					
IP11	**My illness causes difficulties for those who are close to me**					
IP12	**There is a lot which I can do to control my symptoms**					
IP13	**What I do can determine whether my illness gets better or worse**					
IP14	**The course of my illness depends on me**					
IP15	**Nothing I do will affect my illness**					
IP16	**I have the power to influence my illness**					
IP17	**My actions will have no affect on the outcome of my illness**					
IP18	**My illness will improve in time**					
IP19	**There is very little that can be done to improve my illness**					
IP20	**My treatment will be effective in curing my illness**					
IP21	**The negative effects of my illness can be prevented (avoided) by my treatment**					
IP22	**My treatment can control my illness**					
IP23	**There is nothing which can help my condition**					
IP24	**The symptoms of my condition are puzzling to me**					
IP25	**My illness is a mystery to me**					
IP26	**I don't understand my illness**					
IP27	**My illness doesn't make any sense to me**					
IP28	**I have a clear picture or understanding of my condition**					
IP29	**The symptoms of my illness change a great deal from day to day**					
IP30	**My symptoms come and go in cycles**					
IP31	**My illness is very unpredictable**					
IP32	**I go through cycles in which my illness gets better and worse.**					
IP33	**I get depressed when I think about my illness**					
IP34	**When I think about my illness I get upset**					
IP35	**My illness makes me feel angry**					
IP36	**My illness does not worry me**					
IP37	**Having this illness makes me feel anxious**					
IP38	**My illness makes me feel afraid**					

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