ADAPTATION TO CHRONIC PAIN: RELIGIOUS AND NON-RELIGIOUS COPING IN JUDEO-CHRISTIAN ELDERS

by

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DEDICATION

I dedicate this dissertation to the loving memory of my parents Mr. Joseph A.

Verona and Mrs. Irene M. Verona.

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Chapter 1: Introduction

Introduction

Pain is a stressor that can cause physical impairment, psychological, social, and spiritual disability in the elderly (Kahana, Kahana, Namazi, Kercher, & Stange, 1997; Loeb, 1999). An estimated 25 to 50% of community dwelling elders report having pain and this rate increases to as much as 80% among nursing home residents (American Geriatrics Society (AGS), 1998; Loeb, 1999; Miaskowski, 1999). The consequences of untreated or poorly managed pain in older adults include depression, decreased socialization, sleep disturbance, impaired mobility, and loss of independence in performing activities of daily living (ADL) and instrumental activities of daily living (IADL) (AGS, 1998; Kahana et al., 1997). Thus, controlling pain in elders is essential to maintaining quality of life and functional ability in this population.

According to the American Geriatrics Society (1998), pain is a complex, multidimensional phenomenon that originates from sensory stimuli and is altered by an individual's memory, expectations, and emotions. Thus, pain management strategies also need to be multidimensional and include pharmacological as well as non-pharmacological interventions (Ferrell, 1991; Gagliese & Melzak, 1997).

There are many types of non-pharmacological pain management strategies. Cognitive therapy is one that is widely used and has been shown to be effective in the treatment of both psychological (see review by Beck, 1991) and physical health problems (see review by Emmelkamp & van Oppen, 1993). Cognitive therapy is an intervention that aims to help individuals reappraise or reevaluate

stressful thoughts and feelings to minimize the negative effects of stress (Dossey, Keegan, & Guzzetta, 2000). Coping is the use of cognitive and behavioral efforts to manage psychological stress (Lazarus, 1993) and is a form of cognitive therapy (Dossey, et al., 2000). Adaptive coping refers to the effectiveness of cognitive or behavioral efforts in improving adaptational outcomes (e.g., well being, physical health, and social functioning) (Lazarus, 1993). Therefore, adaptive coping strategies are any cognitive or behavioral efforts used by individuals to manage or reduce negative health outcomes.

Many disciplines including nursing, psychology, medicine, sociology, and biology have examined the relationships between a variety of stress-producing situations (e.g., major life events, cancer, and chronic illness), coping, and health outcomes (e.g., life satisfaction, well being, depression, mortality, and morbidity) across the lifespan (Rice, 2000). Of particular interest to this investigator, is the use of religious coping as an intervention for pain control. The term religious coping refers to "the dependence on religious belief or activity to help manage emotional stress or physical discomfort" (Koenig, 1994, p.161). Several researchers have shown that individuals turn to religion and the use of prayer for comfort and relief when experiencing high levels of chronic pain (Crisson, & Keefe, 1988; Keefe, Crisson, Urban, & Williams, 1990; Rosenstiel & Keefe, 1983). However, praying and seeking spiritual comfort has also been linked with negative health outcomes (e.g., greater pain intensity, lower self-efficacy, and inactivity) (Affleck, Urrows, Tennen, & Higgins, 1992; Jordan, Lumley, & Leisen,

1998; Keefe et al., 1997a). Thus, the relationship between religious coping and positive health outcomes is not well established.

Although there is some evidence linking religious coping, psychological well being, and health in elders with pain, there are conflicting explanations of these relationships in the literature. Religious coping is most often classified as an emotion-focused strategy. According to Lazarus (1996), the function of emotion-focused coping is to manage the emotional response to harm or threat. Negative emotions (e.g., anger, sadness, and guilt) that arise from stressful situations can be secondarily appraised as threatening. Thus, people use emotion-focused coping to transform or regulate these negative emotions more positively. Prayer, therefore, is used to positively reappraise distressing emotions rather than to manage the stressful situation (Lazarus & Folkman, 1984).

After an extensive empirical review, Levin and Chatters (1998) identified five different theoretical models that may explain the influence of health status, religious activity, and other mediating factors (e.g., social networks and lifestyle), on mental health outcomes. The theoretical models were conceptualized as:

1. The suppressor model, in which individuals turn to religion and other coping strategies to suppress the negative effects of illness or stress. These coping strategies, therefore, indirectly effect mental health.

2. The distress-deterrent model, which poor health and religious activities are independent of each other (e.g., poor health does not cause an increase in religious behaviors) and each has an opposite effect on mental health.

3. The prevention model, in which religious involvement directly (e.g., psychosocial effects) and indirectly (e.g., promoting health-related behaviors related to the prevention of physical morbidity) has protective effects on mental health.

4. The moderator model, where poor health and stress interact with religion and other mediating factors. The degree to which poor health and stress have a negative effect on mental health is determined by the strength of one's religious involvement.

5. The health effects model, in which poor health directly effects one's ability to participate in religious activities, which may increase the risk for social isolation and negative emotional outcomes.

The complexity of these concepts and the interrelationships between them is evident in the diversity of each model description.

Idler (1987) proposed that religious belief and/or practice may influence the negative effects of stress on health by (a) providing individuals with socially supportive resources (e.g., tangible and emotional), (b) giving purpose and meaning for coping with suffering, and (c) by encouraging health-promoting behaviors (e.g., avoidance of smoking, drug use, and alcoholic consumption).

Carver, Scheier, and Weintraub (1989) postulated that individuals might use religious coping as a source of emotional support, for positive reinterpretation and growth, and/or as an active problem-solving strategy. These authors define active coping as "the process of taking active steps to try to remove or circumvent the stressor, or to ameliorate its effects" (p. 268). Turning to religion

as a coping response is multidimensional in their view, requiring multiple religious-coping sub-scales to measure these strategies.

In summary, theoretical knowledge that explains the functional mechanisms for the use of religious coping in older adults experiencing pain appear to be multifaceted and equivocal. Further investigation of this phenomenon is needed. Thus, the purpose of this study was to explore the use of religious and non-religious coping strategies to manage chronic pain among elderly adults. This study was based on a middle-range theory of adaptation to chronic pain (ACP) proposed by the author. The theory was derived from the Roy Adaptation Model (RAM) (Roy & Andrews, 1999) and was specified for Judeo-Christian elderly adults. This study examined the relationships between chronic pain, religious and non-religious coping, and the health outcomes of functional ability, depression, and spiritual well being.

Background and Significance

Chronic Pain in Elders

Pain is a subjective, unpleasant sensory and emotional experience that has been clinically categorized as either acute (e.g., pain of short duration) or chronic (e.g., pain having a duration of more than three months) (AGS, 1998; Forrest, 1995; Miaskowski, 1999). Acute pain in older adults is caused by tissue damage from trauma or surgery, is typically associated with autonomic activity (e.g., tachycardia, diaphoresis, or mild hypertension), and will usually disappear after the body heals itself. Chronic pain in late life is frequently caused by tissue damage from chronic health problems, such as musculoskeletal conditions (e.g., arthritis, degenerative joint disease, lower back problems, and fractures related to osteoporosis) and neuropathic pain disorders (e.g., diabetic neuropathy and herpes zoster). There are no autonomic indicators of the presence of chronic pain, and symptoms most often persist until death because the body is unable to repair the tissue damaged from chronic disease. Thus, the assessment of chronic pain relies heavily on self-report. Pain that is under-detected by caregivers can decrease quality of life and increase functional disability and depression in older adults (AGS, 1998; Davis, 1997; Ferrell, 1991; Ferrell, Ferrell, & Osterweil, 1990; Gagliese & Melzak, 1997; Horgas & Dunn, 2001, Miaskowski, 1999).

Pain is a significant problem among older adults. Approximately one-half of community-dwelling elders report suffering from chronic pain (Crook, Rideout, & Brown, 1984; Werner, Cohen-Mansfield, Watson, & Pasis, 1998). Ferrell and

colleagues (1990) found that a higher percentage (71.0%) of institutionalized elders reported at least one significant pain problem, and that the pattern of pain symptoms was often described as being intermittent or continuous. In addition, many older adults' under-report painful symptoms because of a belief that it is a normal consequence of aging. Elders are reluctant to report pain for fear of becoming a burden and/or losing their independence. Cognitive, visual and hearing impairments have been identified as major barriers to pain assessment (Horgas & Tsai, 1998; Miaskowski, 1999; Wells, Kaas, & Feldt, 1997). Thus, the exact prevalence of pain among older adults is still largely unknown.

Under-treated or poorly managed pain can effect the physical, psychological, social, emotional, and spiritual well being of older adults. Horgas and Dunn (2001) found significantly higher levels of depression and lower levels of well-being in nursing home residents whose pain was under-detected by their caregivers relative to those residents whose pain was noted. Kahana and colleagues (1997) found that elders with pain were less able to engage in social interactions, had more difficulty performing self-care activities and tasks, were more depressed, and had higher levels of negative affect than elders without pain. Lichtenstein and associates (1998) reported a significant association between pain in specific body locations (e.g., lower leg and back) and functional limitations (e.g., stooping, standing, lifting and carrying, and reaching). Further, Verbrugge, Lepkowski, and Konkol (1991) found that older adults suffering from arthritic pain had difficulty performing ADL and IADL tasks and engaging in physical activities that required endurance and strength. Verbrugge and

associates also found that these functional limitations were greater in elders that reported more than one chronic condition. In a three-year longitudinal study of home-based elders, Mann and colleagues (1999) found significant declines in self-care, mobility, and social function in elders with arthritic pain. Finally, nursing home residents reported that pain affected their ability to participate and enjoy activities, impaired their mobility, disturbed their sleep, and increased their depressive symptoms and anxiety (Ferrell, et al., 1990).

These findings highlight that the consequences of untreated or poorly managed pain are multidimensional, influencing both the quality of life and functional capabilities of elders. Therefore, it is necessary that a holistic, multidimensional approach to pain management be implemented, including the use of pharmacological and non-pharmacological interventions, to reduce the negative consequences of unrelieved pain.

<u>Religious/Non-Religious Coping in Elders</u>

According to Folkman, Lazarus, Gruen, and DeLongis (1986), "coping refers to the person's cognitive and behavioral efforts to manage (e.g., reduce, minimize, master, or tolerate) the internal and external demands of the person-environment transaction that is appraised as taxing or exceeding the person's resources" (p. 572). Coping processes have two main functions: (1) to help manage harmful threats and challenges to one's personal integrity by changing the situation for the better (problem-focused), and (2) to manage the emotional response to harm or threat by transforming or changing the meaning of the transaction (emotion-focused coping) (Lazarus, 1996).

People use both problem-focused and emotion-focused processes in stressful situations. Folkman, Lazarus, Primley, and Novacek (1987) found that older adults use more passive, intrapersonal, and emotion-focused coping processes than younger adults. Felton and Revenson (1987) also found that respondents age 75 and older were significantly less likely to use information-seeking as a coping strategy. Keefe and Williams (1990) reported no significant differences in the pain coping strategies used among participants in four different age groups: young group (21-34 years), middle-aged group (35-54 years), older group (55-64 years) and geriatric group (65 years and older). The older geriatric group, however, reported praying and hoping more often than younger participants did. Thus, there appear to be few differences in the use of coping strategies across the adult life span.

Spirituality is the essence of an individual's personal search to cope and find meaning and purpose in their life through interrelationships with self and others. This relationship may include a transcendent or connected association with a higher being (God) or elements within the universe. Spirituality is a belief in something greater than the self that positively affirms life and creates energy that is constant, yet changing. In the spiritual domain, the uniqueness of the individual is created, the meaning of life is evaluated in health and in illness, the whole person becomes unified, and inner harmony and equilibrium is promoted (Burkhardt, 1989; Dossey, et al., 2000; Laukhuf &Werner, 1998; Oldnall, 1996; O'Neill & Kenny, 1998). When spiritual needs are actualized, individuals experience a deeper understanding of life, feel valued by family and society, are

capable of maintaining relationships with others, cope better with misfortune, and have increased strength and courage. However, spiritual emptiness, fear, depression, anger, hopelessness, apathy, and despair (e.g., spiritual distress) can occur when spiritual needs are not met (Laukhuf & Werner; 1998; Saunders, 1998).

Older adults are at a high risk for spiritual distress because of chronic illness, pain, multiple losses from death of friends and loved ones, and the need to accept the fact that death is imminent. A basic philosophical belief of the totality paradigm in nursing is that human beings are viewed and cared for holistically (Parse, 1987). Individuals are conceptualized as bio-psycho-social-spiritual beings that interact with the environment to maintain an optimum level of health (Cody, 1995; Fawcett, 1993). However, it is the belief of this author and others that the spiritual dimension of human beings is often neglected in practice and there is a lack of theoretical knowledge and research addressing this phenomenon (Hall, 1998; Laukhuf & Werner, 1998; Oldnall, 1996; Saunders, 1998).

Helping elders to cope with pain is a major goal of professional nursing and religious coping may be an important strategy in providing holistic care for optimum health and pain management. Development of a middle-range nursing theory of adaptation to chronic pain (ACP) through the use of religious and non-religious coping in Judeo-Christian elders may enhance clinical practice by elucidating an understanding of how these coping strategies may promote

adaptive or ineffective physiological, psychological, social, and spiritual responses in elders experiencing pain.

Overview of the Theoretical Framework

The Roy Adaptation Model (RAM) (Roy & Andrews, 1999) was chosen to guide the theoretical substruction and development of a middle-range theory of adaptation to chronic pain (ACP) through the use of religious and non-religious coping in Judeo-Christian elders. The RAM was selected because the assumptions, concepts, relational statements and propositions are logically congruent with the phenomenon of interest. Theoretical substruction is an assessment process that identifies the major variables to be studied (e.g., concepts and propositional statements), analyzes their levels of abstraction, identifies hypothesized relations between or among the variables, and links the theoretical and operational systems together (Dulock & Holsemer, 1991; Hinshaw, 1979). This section will present an overview of the RAM and the proposed middle-range theory ACP. The proposed model will then be tested using structural equation modeling (SEM), a model-testing and model-building statistical technique.

Scientific and Philosophical Assumptions of the RAM

According to Meleis (1997), a theory should begin with a set of explicit theoretical assumptions. Theoretical assumptions are "statements that describe concepts or connect two concepts that are factual, accepted as truths, and represent values, beliefs, or goals" (p. 12). The scientific assumptions underlying Roy's model are based on Systems and Adaptation Theory (Roy & Andrews,

1999). Individuals are viewed as holistic, adaptive systems that function as

unitary wholes through interdependent parts to maintain homeostasis. Control

processes related to inputs (stimuli), outputs (behaviors), and feedback

information explain how human's function as adaptive systems. Individuals are

presumed to have the potential to make changes and adapt to the environment.

However, these changes are dependent on the adaptation level of the human

system, the demands of the situation, and the person's internal resources

(Roy & Roberts, 1981).

The fundamental philosophical propositions of the RAM are that human's (a)

possess creative abilities, (b) behave purposefully, (c) are holistic beings, and (d)

try to maintain integrity through interpersonal relationships. These assumptions

explain a common purpose and unity of human existence, and give meaning and

value to life (Roy & Andrews, 1999).

Recently, Roy and Andrews (1999) expanded the RAM assumptions for the

21st century to include a "futuristic view of the human system, environment, and

universe as progressing in structure, organization, and complexity" (p. 34)

towards an omega point of creation spirituality (Roy, 1997). The purposefulness

of the human adaptive system has now changed from a self-regulatory

homeostatic system to one that also enhances the environment and creates a

universe that gives meaning to human existence through the belief in a Supreme

Being. A Supreme Being that is characterized as "personal, totally giving, and

loving beyond all creation and has been repeatedly postulated from ancient to post-modern civilizations, in both Eastern and Western cultures" (Roy, 1997, p. 45).

<u>Scientific and Philosophical Assumptions of the Middle-Range Theory of ACP</u>

Concepts and their interrelationships from Roy's (1997) scientific and philosophical assumptions and a synthesis of the research literature on chronic pain, religious and non-religious coping were used to develop the assumptions for the middle-range theory of adaptation to chronic pain through religious and non-religious coping in Judeo-Christian elders. The explicit theoretical assumptions are:

(1). Pain is a complex multidimensional stimulus that will provoke coping responses (e.g., religious or non-religious) in Judeo-Christian elders.

(2). Judeo-Christian elders are purposeful bio-psycho-social spiritual beings that create and enhance environmental systems through the belief in a Supreme Being.

(3). Judeo-Christian elders believe that a Supreme Being is personal, totally giving, and loving beyond all creation.

(4). Judeo-Christian elders equate their spirituality with the belief in a Supreme Being.

(5). Adaptation to chronic pain is the process and outcome of Judeo-Christian elders who choose religious and non-religious coping to create human and environmental integration that promote survival, growth, and integrity.

Analysis of the Roy Adaptation Model

Roy conceptualizes humans as holistic adaptive systems in constant interaction with stimuli (Roy & Andrews, 1999). The process of adaptation is initiated when input or stimuli from the environment (internal or external) provoke a response in the human system. Three classifications of input or stimuli are identified in this model. The first classification is the focal stimulus or stimuli that are immediately affecting the system. Focal stimuli may be internal or external and the system is aware of their presence. Contextual stimuli are all the environmental factors within or outside the system that contribute to the effect of the focal stimulus. These factors influence how the system will cope with the focal stimulus. The last classification is the residual stimuli that include all unknown or unconscious factors affecting the system (Roy & Andrews, 1999).

The response or human behavior (output) is a function of the input stimuli and the systems adaptation level. The adaptation level represents the condition of the system's life processes described as integrated, compensatory, and compromised. Integrated life processes function as a whole to meet human needs. Compensatory life processes are activated when the cognator and regulator are challenged to integrate life processes. Compromised life processes are the result of inadequately integrated and compensatory life processes. Human behaviors (output) act as feedback (input) for the system and are evaluated as adaptive or ineffective responses, thus allowing the system to decide whether to increase or decrease efforts to cope with the stimuli (see Figure 1) (Roy & Andrews, 1999).

Stressor:
Focal stimulus

Adaptive
response

Stress ──────────► Coping
mechanisms

Ineffective
response

Mediating Factors:
Contextual and residual stimuli
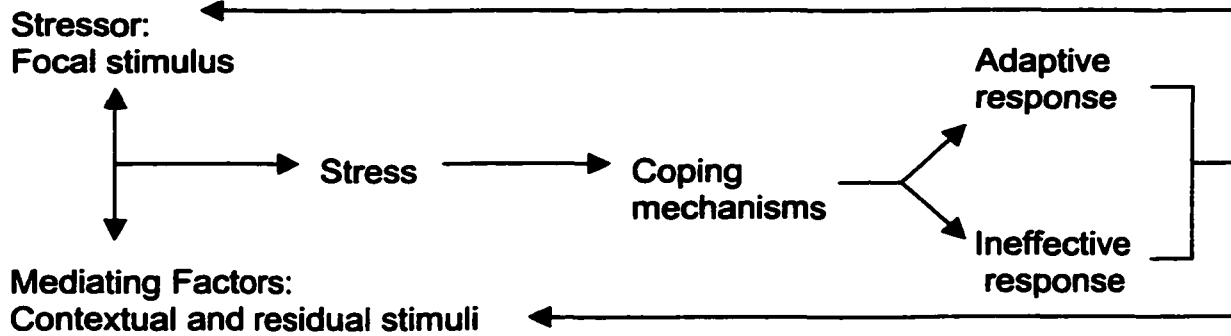
Figure 1. Diagram of Roy's Adaptation Model (Roy & Roberts, 1981).

Input stimuli (e.g., focal stimulus and contextual stimuli) in this study were

chronic pain (e.g., total pain intensity) and age, gender, and race. Religious and

non-religious coping strategies were the compensatory life processes activated

by the cognator. The output (e.g., adaptive modes) in this study were the

empirically measured human behavioral responses (e.g., functional ability,

depressive symptoms, and spiritual well-being. (see Table 1).

Table 1

Theoretical Constructs, Study Variables, and Operational Definitions.

Constructs	Variables	Operational Definitions
Stimuli -Contextual	Age, Gender, Race	Age, gender, and race of the participant.
-Focal	Total Pain Intensity	Self-reported summation of the average, worst, and least pain intensities experienced by the participant in the last week.
Compensatory Life Processes Coping	Religious Coping	The number of coping strategies that use religious beliefs or behaviors to prevent or reduce the negative physical and emotional correlates of stress associated with chronic pain the participants report using in the last week.
	Non-Religious Coping	The number of non-religious cognitive or behavioral coping efforts used to prevent or reduce the negative physical and emotional correlates of stress associated with chronic pain that participants report using in the last week.
Adaptive Modes -Physiological Mode	Functional Ability	The perceived level of difficulty in performing activities of daily living due to pain in the past week.
-Psychological Mode	Depression	The number of self-reported depressive symptoms felt in the last week.
	Spiritual Well-being	The perceived level of spiritual well-being in the last week.

Middle-Range Theory

Adaptation to chronic pain (ACP) is the process and outcome of Judeo-Christian elders who choose religious and non-religious coping to create human and environmental integration that promotes survival, growth, and integrity. The process of adaptation is initiated when a painful stimulus (focal stimulus) provokes a response in the elder. Age, gender, and race (contextual stimuli) of the elder will influence the magnitude of the pain stimulus. The pain stimulus activates the autonomic nervous system, and through a perceptual process, the elder becomes consciously aware of the pain. The elder responds by using religious and non-religious coping strategies as compensatory life processes to alleviate the negative effects of the pain stimulus. The effectiveness of the elders' compensatory life processes will then be influenced by the relationship between the magnitude of the pain stimulus, the autonomic physiological responses, and the use of coping strategies. The adaptive ability of the coping strategies will become evident in the bio-psycho-social and spiritual behaviors of the elder (e.g., greater psychological and spiritual well-being and less difficulty performing ADL and IADL activities) (see Figure 2).
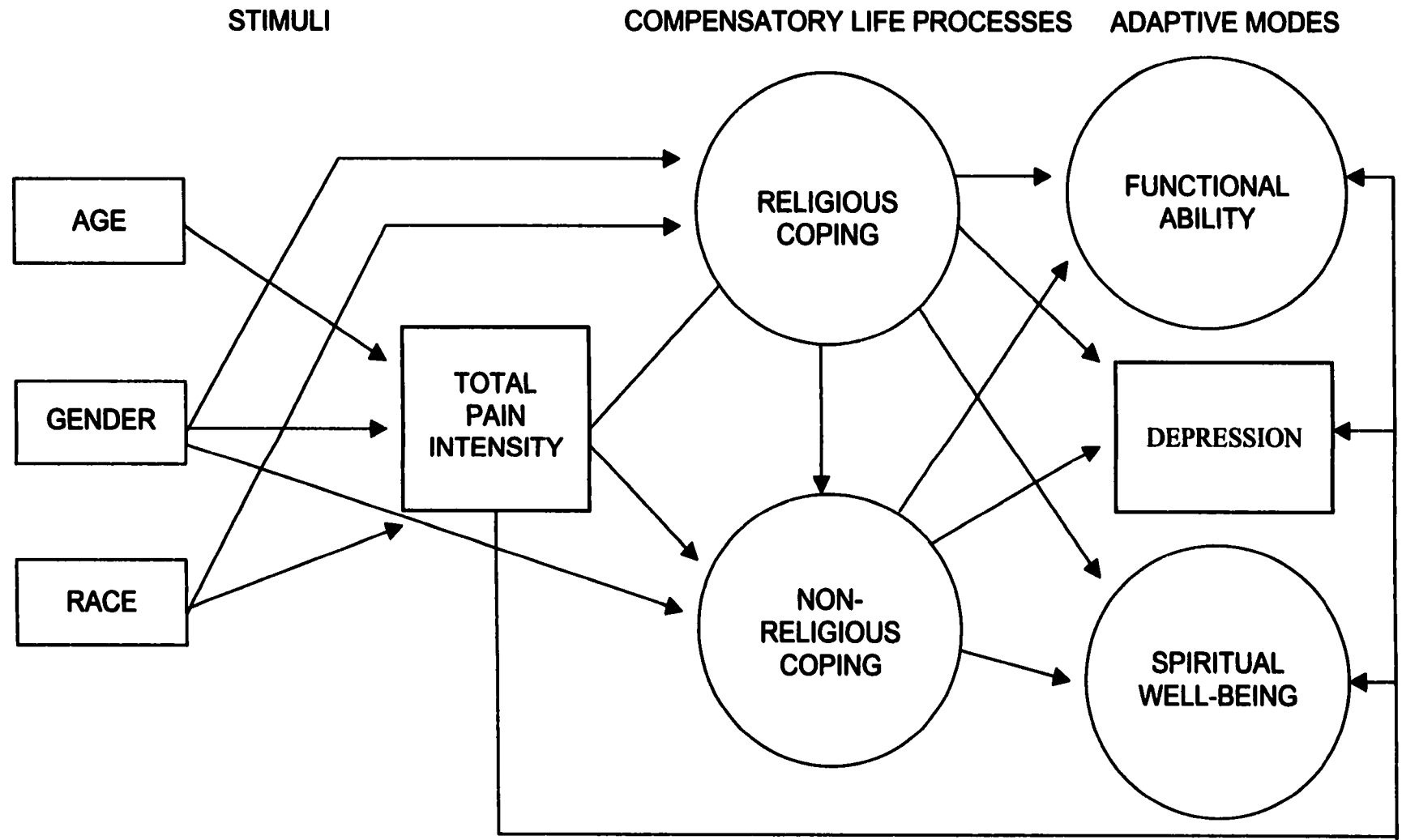
Figure 2. Model diagram of the midrange theory of adaptation to chronic pain (ACP).

Research Questions and Hypotheses

Research Questions

The purpose of this study was to explore the use and correlates of religious and non-religious coping to manage chronic pain among elderly Judeo-Christian adults. Specifically, this study addressed the following research questions:

1). What are the relationships between background contextual factors (e.g., age, gender, and race) and chronic pain intensity?

2). What are the relationships between chronic pain and three health outcomes (e.g., functional ability, depression, and spiritual well-being)?

3). What is the relationship between religious and non-religious coping strategies used among Judeo-Christian elderly adults?

4). What are the relationships between gender, race, and the use of religious coping, and gender and the use of non-religious coping strategies?

5). What are the relationships between chronic pain and the use of religious and non-religious coping?

6). Does the use of religious and non-religious coping mediate the relationship between chronic pain and health outcomes (e.g., functional ability, depression, spiritual well-being) after controlling for background contextual factors?

<u>Research Hypotheses</u>

The specific research hypotheses of this study were (see Figure 3 for a diagram of the model with specified hypotheses).

1). Background contextual variables will be significantly associated with the total chronic pain intensity score (H1). Specifically, three exploratory hypotheses will be tested:

      1.1 Age will be significantly associated with total pain intensity.

      1.2 Gender will be significantly associated with total pain intensity.

      1.3 Race will be significantly associated with total pain intensity.

2). Total chronic pain intensity will be significantly associated with three health outcomes (H2). Specifically:

      2.1 Higher total pain intensity will be significantly related to lower levels of functional ability.

      2.2 Higher total pain intensity will be significantly related to higher levels of depression.

      2.3 Higher total pain intensity will be significantly related to lower levels of spiritual well-being.

3). The use of religious and non-religious coping strategies will be positively and significantly correlated (H3).

4). Background contextual variables will be significantly associated with use of religious and non-religious coping strategies to manage pain (H4). Specifically:

4.1 Gender will be significantly associated with the use of religious and

non-religious coping.

4.2 Race will be significantly associated with the use of religious coping.

5). Total chronic pain intensity will be significantly associated with higher levels of

religious and non-religious coping strategy use (H5).

6). The relationship between total chronic pain intensity, functional ability,

depression, and spiritual well-being will be mediated by the use of religious and

non-religious coping, after controlling for background contextual factors (H6)

STIMULI   COMPENSATORY LIFE PROCESSES   ADAPTIVE MODES

(H4)

RELIGIOUS
COPING

(H6)

FUNCTIONAL
ABILITY

(H2,H6)

AGE

(H1)

(H4)

(H6)

(H6)

(H5, H6)

(H3)

(H6)

(H2,H6)

GENDER

(H1)

TOTAL
PAIN
INTENSITY

DEPRESSION

(H5, H6)

(H6)

(H1)

(H4)

NON-
RELIGIOUS
COPING

(H6)

(H2,H6)

RACE

(H6)

SPIRITUAL
WELL-
BEING
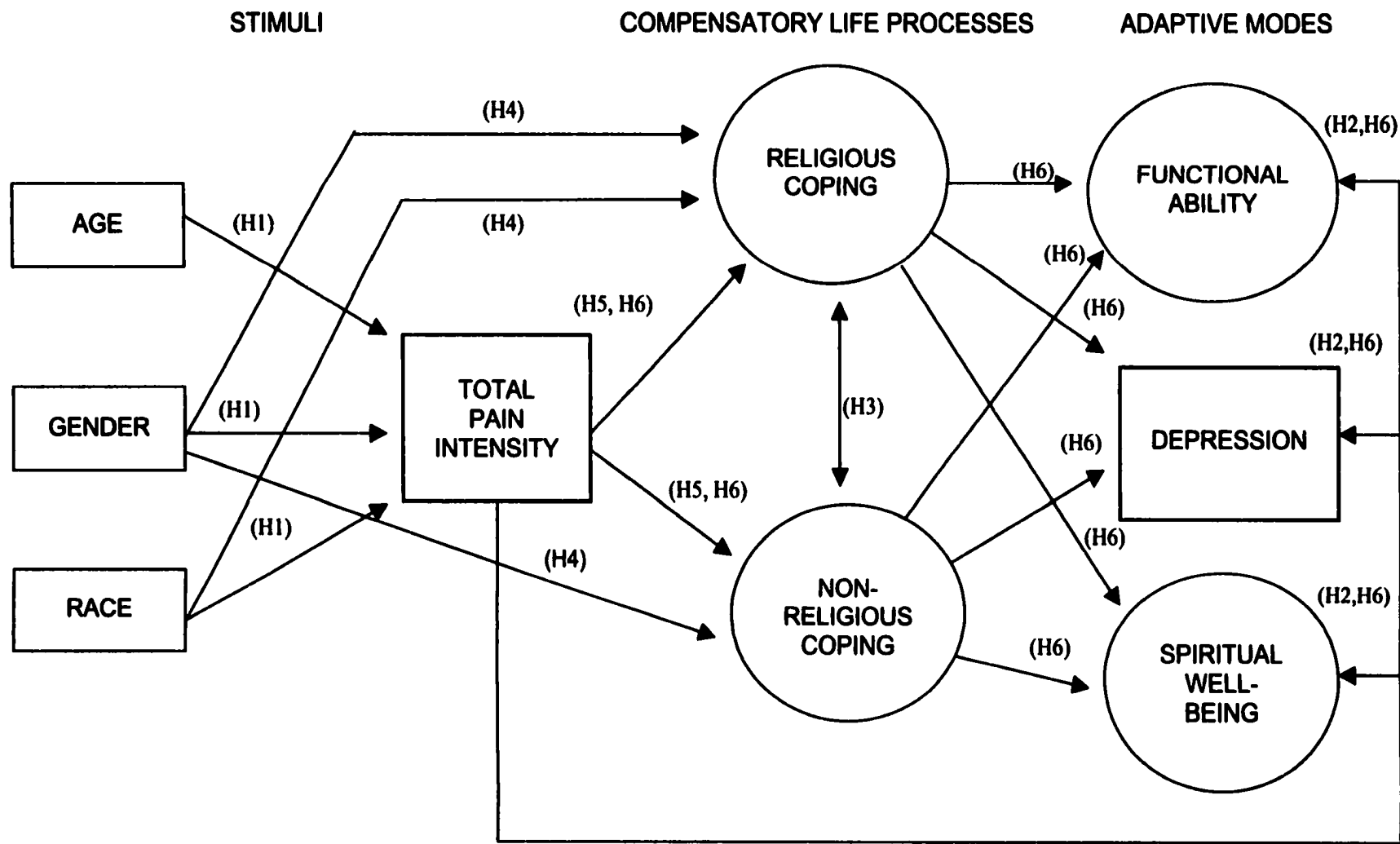
Figure 3. Diagram of the ACP model and hypothesized relational statements.

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Conclusion

Scholarship in nursing is evident when there is a synthesis of knowledge, theory, research, philosophy, and practice (Meleis, 1997). The ontology or patterns of knowing in nursing were identified in 1978 when Carper developed a model that categorized nursing knowledge into (a) empirical (e.g., theoretical knowledge that aims to describe, explain, and predict), (b) ethical (e.g., moral decision making), (c) personal (e.g., self knowledge), and the (d) esthetical (integrating action and the art of nursing) (White, 1995). The middle-range theory of adaptation to chronic pain through religious and non-religious coping in Judeo-Christian elders will increase disciplinary knowledge by providing a more in-depth empirical explanation of the cognator processes utilized in adaptation. The cognator processes in Roy's model are identified but not clearly defined and explained. Further work is needed to develop how cognator processes alter the focal stimulus in the compensatory adaptational process. Data from this study may support existing empirical evidence, and provide explanatory relational statements that link chronic pain, religious and non-religious coping, and health outcomes in Judeo-Christian elders.

Chapter II: Review of the Literature

Pain in Late Life

A review of the key research literature in the last twenty years that investigated pain, coping, and health outcomes in older adults will be presented in this section. First, research that examined the prevalence of the focal stimuli (e.g., chronic pain), contextual correlates (e.g., age, gender, and race), and outcomes (e.g., functional ability, depression, and psychological well-being) of chronic pain among older adults will be presented. Second, the use and correlates (e.g., age, gender, and race) of coping strategies (e.g., religious and non-religious coping strategies) in the management of chronic pain will be explored. Finally, the relationship between chronic pain, coping strategies (e.g., religious and non-religious coping), and health outcomes (e.g., functional ability, depression, and psychological well-being) will be reviewed.

Prevalence of Chronic Pain in Older Adults

While the phenomenon of pain has been studied extensively in the scientific community, pain in older adults has only recently become the focus of research. There have, however, been a limited number of epidemiological studies that examined the prevalence and scope of pain among elderly adults. Ferrell and colleagues (1990) found that 71% of residents in one long-term care facility reported at least one significant pain problem, and the pattern of pain symptoms was often described as being intermittent or continuous. Movement, weight bearing, or exertion was typically reported as the reason for intermittent pain. Thirty-six percent of residents reported more than one location of pain

(Range = 1-4), with the lower back being the most frequently cited source, followed by previous fractures and neuropathies. Effects of pain included impaired mobility, decreased ability to participate in activities, and sleep disturbances in approximately one-half of the residents.

A later study investigated the prevalence of pain among skilled nursing home residents with cognitive impairment. Residents in this sample were cognitively impaired, with an average score of 12 (S.D. = 7.9, Range = 0-30) on the Folstein Mini-Mental State Exam (cognitively intact is scored as ≥24). Pain at the time of the interview was reported by 62% of residents, and 42% complained of pain in more than one body location. Arthritis was identified as the most common cause of pain, followed by old fractures and neuropathies. Pain locations most frequently cited were the back, knee, ankle, and foot. Residents described their pain as tiring, nagging, hurting, exhausting, and annoying (Ferrell, Ferrell, Rivera, 1995).

In a community-based sample, Werner and associates (1998) found that approximately one-half of a sample of community-dwelling elders reported having pain. Among the elders experiencing pain, the intensity was rated, on average, as mild. The major source of pain was musculoskeletal/arthritic pain, headaches, and lower back. Elders with severe to excruciating pain were also found to have 1) more ADL impairments, 2) greater number of co-morbid conditions, 3) used pain medications more often, 4) had musculoskeletal disease, and 5) diagnosis of dementia.

These studies highlight the fact that pain is a significant problem in older adults. The high prevalence of musculoskeletal disease (e.g., arthritis) in this population was found to be the most common cause of this finding. In addition, a high percentage of older adults reported that they experienced pain in more than one body location. This may explain why pain was also found to be significantly associated with mobility impairments, inactivity, and difficulty performing activities of daily living (Ferrell, et al., 1990; Werner, Cohen-Mansfield, Watson, & Pasis, 1998). Thus, chronic pain is a significant problem for older adults and warrants investigations into the use of coping strategies to manage chronic pain in this population.

Relationship Between Background Contextual Factors and Pain

Relationship between age and pain. Age-related changes in the sensory pathway (e.g., sensory receptors, peripheral nerves, and the central nervous system) and the reduced production of natural opioids have been hypothesized to influence the sensation and perception of pain in late life (Gibson & Helme, 1995; Klinger & Spaulding, 1998). In a sample of chronic pain patients, Turk and colleagues (1995) reported that patients in the Young group (e.g., ≤ 69 years of age) reported significantly higher pain intensity scores then those in the Old group (e.g., ≥ 70). Similarly, Corran and associates (1997) found that pain clinic patients who were younger than 65 years of age reported significantly more pain than those patients 65 years of age and older. However, an extensive review of the research literature on pain and aging concluded that there was no definitive evidence to suggest age-related changes in late life alter the sensation and

perception of pain (Harkins, Kwentus, & Price, 1984). Harkins and associates determined that the disparity in findings across these studies was largely the result of differences in methodology (e.g., pain was induced with different modes of thermal, mechanical, and electrical stimuli) and subject selection (e.g., healthy volunteers). Therefore, additional studies are warranted to determine if age-related differences in pain perception exist among community-dwelling older adults experiencing chronic pain.

Relationship between gender and pain. Results of studies using experimentally induced pain in humans suggested that women have lower pain thresholds (e.g., minimum amount of stimulation that elicits self-reported pain) and have less tolerance (e.g., endurance of pain measured by time or stimulus intensity) to noxious stimuli than men (Miaskowsk, 1999; Vallerand, 1995). However, few studies have investigated these differences in older adults. A recent meta-analysis of 17 studies conducted by Riley III and associates (1998b) found that male participants reported significantly higher mean pain threshold levels to different types of noxious stimuli than female participants. These studies however, were based on samples of high school and undergraduate students. These researchers also found that the male participants had significantly higher levels of pain tolerance than did female participants across 9 studies with samples ranging from 10 to 81 years of age (Riley III, Robinson, Wise, Myers, & Fillingim, 1998b).

Paulson and colleagues (1998) reported that female adults rated the intensity of pain higher and had significantly greater cerebral activation with positron

emission tomography (PET) than male adults using thermal stimuli. In this sample, age ranged in this sample between 18 and 39 years. Riley III, Gilbert, and Heft (1998a) investigated gender differences in orofacial pain among elders 65 years and older and found that women were more likely to report jaw joint and face pain than men. There were no significant differences, however, in pain intensity ratings across orofacial locations.

Keefe and colleagues (2000) investigated gender differences in pain intensity and pain behavior among adult patients with similar osteoarthritic conditions. These researchers found that women reported greater pain intensities and displayed more pain behaviors (e.g., guarded movements, rubbing and flexing of the knee, and joint rigidity) than men with similar disease pathology.

Findings from these studies suggest that gender differences in pain threshold and pain tolerance have been found, however most of these studies have been done on young and healthy samples using noxious stimuli to elicit pain. Further research is needed in samples of community-based older adults experiencing chronic pain to generalize these findings.

Relationship between race and pain. Ethnic group affiliation has been found to be associated with differences in pain perception. Bates, Edwards, and Anderson (1993) investigated the differences between the perception of chronic pain intensity and six ethnic/cultural groups (e.g., Americans, Hispanics, Irish, Polish, Italian, and French Canadian) and found that Hispanic participants reported significantly higher pain intensity ratings than the Americans, French Canadians, and Polish. In addition, Hispanic participants reported more pain-related

interference with work and daily activities and expressed significantly higher degrees of unhappiness, depression, tension, and anger with their pain.

Johnson-Umezulike (1999) examined the differences in pain perception between elderly African Americans and Caucasians and found that the African American elders reported significantly lower pain intensities than Caucasian elders, and *nagging* was the pain descriptor selected most often by participants in both racial groups. Jordan and colleagues (1998) found no significant differences in self-reports of pain severity and negative affect between adult African-American and Caucasian women.

To summarize, the research evidence explaining the relationship between background contextual factors and pain among older adults is limited and yields diverse results. There is some evidence, however, to suggest that adults 65 years and younger, adult females, Hispanic adults, and Caucasian elders perceive and report higher pain intensities than those who are 65 years and older, adult males, and African-American elders. Thus, these contextual factors appear to have some influence on pain and warrant further investigation.

<u>Outcomes of Pain</u>

<u>Relationship between pain and functional ability.</u> Functional ability is the actual or potential capacity of individuals to perform activities and tasks of daily living (Frank-Stromberg & Olsen, 1997). The ability to perform everyday tasks is critical in late life because it is considered essential for independent living (Horgas, Wilms, & Baltes, 1998). Functional disability (e.g., impairments in one or more ADL or IADL tasks) is caused by a variety of cognitive and physical

conditions that are common in late life. Chronic pain, which is typically a symptom of pathology, has also been consistently linked with functional disability (Keefe, et al., 2000; Moss, Lawton, & Glicksman, 1991; Verbrugge, et.al., 1991). One explanation of this relationship has been conceptualized as the "disablement process" (Nagi, 1991). According to this model, the disablement process will begin with some form of pathology (e.g., disease or injury) that can lead to functional impairments or dysfunctions in bodily systems (e.g., cardiovascular, neurological, or musculoskeletal). These functional impairments are directly linked with functional limitations (e.g., restrictions in mobility, motion, and strength) that can lead to disability. Functional disability is characterized by difficulty performing ADL (e.g., daily activities related to personal care) and IADL tasks (e.g., activities related to caring for home and community living. Thus, one explanation for the association between chronic pain and functional disability is that arthritis can lead to musculoskeletal impairments, limiting an individual's strength and mobility, and resulting in difficulty performing ADL and IADL tasks.

Williamson and Schulz (1992) found, in a sample of community-dwelling older adults, that pain restricted the ability to maintain regular eating habits, go shopping, and to work on hobbies. Moss, Lawton, and Glicksman (1991) found that older adults who reported having pain had higher levels of restricted activity, had longer periods of doing nothing and napping, and spent less time visiting with others. Finally, Kahana and associates (1997) reported that among older adults residing in retirement communities, elders who reported greater and more frequent pain intensities were less likely to engage in a variety of valued social

activities and had difficulty performing ADL and IADL activities. Thus, the relationship between pain and functional disability is well established in the research literature.

Relationship between pain and depression. A large number of research studies have reported that a positive association exists between depression and chronic pain (see Romano & Turner, 1985 for review). Parmalee, Katz, and Lawton (1991) found that institutionalized elders who reported more intense pain and had greater numbers of painful body locations had higher levels of depression than elders with less pain and fewer painful body locations. Cohen-Mansfield and Marx (1993) found support for these research findings among residents in a large suburban long-term care facility. In addition, an association between depression and pain has also been found among elders residing in the community (Horgas, 1998; Williamson & Schulz, 1992).

Relationship between pain and spiritual well-being. To date, there has been no known published research that investigated the relationship between pain and spiritual well-being. The relationship, however, between pain and other dimensions of psychological well-being have been examined. Kahana and associates (1997) studied the relationship between pain, positive and negative affect, self-esteem, and life satisfaction as indicators of well-being among community-dwelling older adults. These researchers found that elders with pain were generally more negative, had lower self-esteem, and were less satisfied with life than elders without pain.

Moss and associates (1991) measured levels of happiness, hope, and interest in the world as indicators of psychological well-being among older community-dwelling residents with pain. In this study, elders with pain were found to be significantly more unhappy than elders without pain. Higher levels of anxiety among institutionalized elders with pain have also been reported (Casten, Parmalee, Kleban, Lawton & Katz, 1995).

In summary, an association between pain, functional ability, depression and various indicators of psychological well-being among older adults is well established in the research literature. Spiritual well-being, however, has not been explicitly examined as an indicator of spiritual health in elders with chronic pain. Thus, investigation of the relationship between chronic pain as a predictor variable and spiritual well-being as an outcome variable represents a new line of inquiry.

Coping with Pain in Late Life

According to Lazarus (1993), coping strategies must be measured separately from their outcomes to determine their adaptiveness (e.g., ability to improve outcomes) or maladaptiveness. When coping implies efficacy (e,g., one coping strategy is considered inherently better than another), there is an inevitable confound between the process of coping and the outcome of coping. Coping, as defined by Lazarus and Folkman (1984), is the use of "cognitive and behavior efforts to manage specific external and internal demands that are appraised as taxing or exceeding the resources of the person" (p.141). The function of these cognitive and behavioral efforts are either directed at changing the environment

(e.g., problem-focused) or directed inward to change the meaning of an event, or to increase understanding (e.g., emotion-focused). Coping function, therefore, "refers to the purpose a strategy serves; outcome refers to the effect a strategy has" (Lazarus & Folkman, 1984, p. 149). Thus, the use of coping strategies will be measured and examined independent of health outcomes in this study.

Relationship Between Religious and Non-Religious Coping

Individuals use both problem-focused and emotion-focused coping strategies when dealing with stressful events. Generally, problem-focused coping is typically used when demands are appraised as amenable to change. When nothing can be done to change the threat or demand, emotion-focused coping is more often used (Lazarus & Folkman, 1984).

Coping efforts that use religious beliefs or behaviors to prevent or reduce the negative emotional outcomes of stress has been conceptualized as religious coping (Dossey, et al., 2000; Koenig, 1994) and function as an emotion-focused strategy (Lazarus & Folkman, 1984). Religious coping strategies include the use of prayer, attending religious services, reading the Bible, listening to religious programs and music, and seeking counsel from clergy (Koenig, G. 1998; Koenig, Pargament, & Nielsen,1998; Pargament, 1997). Other non-religious coping strategies are either cognitive efforts (e.g., use of self-statements such as "I can deal with this") or behavioral efforts that include increasing or decreasing specific activities (e.g., resting, exercising, use of heat and cold) (Turner, Jensen, & Romano, 2000).

The relationship between religious and non-religious coping among older adults has not been explicitly examined. Theoretically, if chronic pain is appraised as amenable to change, then behavioral coping strategies will be used. Conversely, if pain is appraised as not amenable to change, then cognitive coping strategies will be used. Both religious and non-religious coping strategies have behavioral and cognitive components. Therefore, elders may choose to use a combination of strategies that include both religious and non-religious coping efforts. Thus, this study will postulate that a positive association will exist between the use of religious coping and non-religious cognitive coping strategies.

Relationship Between Gender, Race, Religious and Non-Religious Coping

Very little empirical literature has focused on gender and racial differences in the use of religious coping strategies to manage chronic pain. Research, however, that examined gender and racial differences in the use of general pain coping strategies, which include the use of prayer and seeking spiritual comfort as indicators of religious coping, has been reported. Jordan, Lumley, and Leisen (1998) examined ethnic differences in pain coping strategies between African-American and Caucasian women and found that African-American women used praying, hoping, and diverting attention significantly more often than Caucasian women did. Caucasian women reported using more coping statements (e.g., "I tell myself that I can overcome the pain") and ignoring the pain. There were no differences between the racial groups in self-reports of pain severity or negative affect. In addition, praying and hoping was a positive and significant predictor of

inactivity among African-American women, but was associated with increased activity in Caucasian women.

Dunn and Horgas (2000) found that 96% of community-dwelling elders reported using prayer to cope with stress. In addition, women and African Americans reported using prayer to cope significantly more often than men and Caucasians. There were no significant differences in the use of prayer as a coping strategy according to marital status, religion (e.g., Catholic or Protestant), age groups, or socio-economic levels.

Affleck and colleagues (1999) explored gender and disease effects on daily pain, mood, and coping among osteoarthritis (OA) and rheumatoid arthritis (RA) patients and found no gender or disease differences in the use of pain reduction attempts (e.g., did something specific to try and reduce the pain). Women with RA and OA reported using a higher proportion of relaxation, distraction, redefinition, venting emotions, seeking spiritual comfort, and seeking emotional support pain coping strategies than did men.

Keefe and associates (2000) examined gender differences in the use of catastrophizing as a coping strategy among adult patients with OA of the knee. A catastrophizing scale was used to assess how frequently the patients reported using catastrophic thoughts and ideas (e.g., "I worry all the time about whether it will end"). These researchers found that women patients with more intense pain used catastrophizing to cope with pain more often than men.

These findings provide some evidence to suggest that background contextual factors may influence individuals' use of coping strategies. Women and African-

Americans, for instance, have been found to use prayer and seek spiritual

comfort more often then men and Caucasians. Women with severe pain were

also found to use catastrophizing more often than men. Further research is

needed to validate these findings with other racially diverse, representative

samples of older populations.

<div align="center">Pain, Coping, and Health Outcomes</div>

Although the use of religious coping to manage pain in elders has not been

widely examined, it has been cited by elders as a major coping strategy (Crisson,

& Keefe, 1988; Keefe, et al., 1990; Rosenstiel & Keefe, 1983). In these studies,

the use of prayer as a religious coping strategy is usually measured as a single

item on a larger, more general coping scale, or as a religious coping subscale.

Most attention has been given to the investigation of frequently used coping

strategies among older adults suffering with chronic arthritis and their adaptive or

maladaptive relationship with physical and mental health outcomes. The results

of these studies will be summarized below.

<u>Relationship Between Pain, General Coping Strategies, and Health Outcomes</u>

Coping with pain among older adults with arthritis (e.g., osteoarthritis and

rheumatoid arthritis) has been widely examined in the scientific community

because of the high prevalence of this disease in this population (Verbrugge, et

al., 1991). Keefe and associates (1987) examined the pain coping strategies of

osteoarthritis patients with chronic knee pain. He found that patients who used

diversion, reinterpretation, coping self-statements, ignored the pain, prayed and

hoped, and increased their level of activity were more psychologically and

physically disabled and had higher ratings of pain. Patients who used more catastrophizing and rationalized that they could control and decrease their pain were less psychologically and physically disabled, and had lower ratings of pain.

Keefe and associates (1991) further investigated the use of pain coping strategies in rheumatoid arthritis patients who had knee replacement surgery and reported that the most frequently used strategies included calming self-statements, praying or hoping, diversion, and exercise. Patients who had a greater sense of control over their pain and could rationalize and think through their pain experience had lower pain intensity, lower levels of physical and psychological disability, and exhibited less pain behavior than those patients who perceived less control and could not rationalize their pain. Patients who reported using more coping strategies were also able to walk at a faster pace after surgery than patients who reported using fewer coping strategies. In addition, Keefe and associates found that there were no differences between age and gender on the use or perceived effectiveness of coping skills.

Brown, Nicassio, and Wallston (1989) examined the relationship between pain, the use of active and passive pain coping strategies and depression over time. These researchers found that patients who reported moderate levels of pain intensity were also moderately depressed at baseline. The severity of depression, however, increased over time with the frequent use of passive coping strategies (e.g., depending on others, restricting social activities) while depressive symptoms decreased with the use of active coping strategies (e.g., staying busy or active).

Affleck, Urrows, Tennen, and Higgins (1992) explored daily coping with pain among individuals with rheumatoid arthritis by having participants record their use of coping strategies, joint pain, and mood in a diary for 75 consecutive days. Forty percent of these participants recorded at least one pain coping strategy per day. The most frequently reported pain coping strategies in descending frequencies were relaxation, seeking spiritual comfort, distraction, and seeking emotional support. Daily pain was more intense among participants with greater disability and who perceived less control over their pain. Daily mood was more positive among participants who had a greater sense of control over their pain and in older participants. Finally, participants who recorded using more relaxation strategies had less intense pain. Participants who recorded using more emotional expressions and seeking spiritual comfort described their pain as more intense.

Hampson and colleagues (1996) investigated the coping abilities of patients with osteoarthritis. These authors found that participants who appraised their pain and health more negatively and used more passive coping strategies (e.g., depended on others, engaged in wishful thinking, and restricted activity) were more depressed over time than patients who appraised their pain and health more positively.

Keefe and associates (2000) reported that among adult men and women with osteoarthritic pain, the use of catastrophizing was found to mediate the relationship between gender and three health outcomes. In this study, women were found to report significantly greater pain intensities, higher levels of physical

disability, and demonstrate more pain behaviors than men. This relationship, however, was no longer significant after the inclusion of catastrophizing as a relational path between gender and pain intensity, physical disability, and pain behaviors. In other words, the use of catastrophizing, as a coping strategy, lowered the levels of pain intensity, physical disability, and pain behaviors among women with osteoarthritic pain.

These research findings suggested that patients with arthritis cope with pain almost on a daily basis. Pain coping strategies that were used most often included coping self-statements, praying and hoping, ignoring the pain, relaxation, diversion, and exercise. Active pain coping strategies was found to be related to better psychological and physical health outcomes than passive coping strategies. In addition, support was found for the theoretical model that postulated that coping efforts function as a mediator between stress and health outcomes (Folkman & Lazarus, 1988). These findings, however, were in adult samples, and the need to investigate the use of pain coping strategies in geriatric populations is necessary to enhance the generalizability of these findings.

Relationships Between Pain, Religious Coping and Health Outcomes

There is a growing body of evidence that support an association between the use of religious coping to manage pain and health outcomes. For instance, Keefe and colleagues (1987; 1991; 1997a; 1997b) investigated the pain coping strategies of osteoarthritic and knee replacement patients using the Coping Strategies Questionnaire (CSQ). The CSQ is a 42 item scale consisting of seven, six-item subscales; religious coping is measured via a subscale called *praying or*

hoping. Keefe and colleagues reported that a high percentage of patients from these studies reported used prayer or hoping as coping strategies and were characterized as being active copers engaged in a variety of coping strategies. However, the frequent use of prayer or hoping was found to be associated with higher pain intensities, higher levels of psychological and physical disabilities, and lower levels of self-efficacy for function.

Burke and Flaherty (1993) investigated the coping strategies of elderly women with osteoarthritis and found that 90% of the sample reported using prayer to cope based on the Ways of Coping Scale (WOCS). Prayer is measured on the WOCS as a single item in the positive reappraisal subscale. According to this subscale, prayer is used to reappraise the pain experience to find meaning and purpose to suffering, and provides evidence for spiritual and personal growth.

Findings from these pain studies support the high prevalence of religious coping among older adults and a positive association with higher levels of pain and disability. Religious coping was not found, however, to be significantly related with better psychological outcomes. One possible explanation maybe related to the measurement tools used in these studies. According to Nunnally and Bernstein (1994), the assessment of reliability of any measurement tool is a direct function of the number of items used in the scale. Therefore, the use of a single item to measure religious coping is not a reliable measure of this construct.

Another possible explanation is that coping is situation specific and differs across various health conditions. Further investigation is needed using different

measures of religious coping to determine how it is used, and whether these strategies are adaptive or ineffective in managing the negative effects of chronic pain in older adults.

<div align="center">Roy Adaptation Model-Based Research</div>

Since the first publication of the Roy Adaptation Model (RAM) in 1970, nurses from around the world have used RAM to guide their nursing practice, education and research (Boston Based Adaptation Research in Nursing Society, 1999). This section will present gerontological research studies that adopted major concepts and propositions from the RAM as their theoretical framework. Gerontological research will be the focus of this review because older adults are the population of interest and, to date, there is no known published research that has used the RAM to examine chronic pain in older adults.

RAM-Based Gerontological Research

Use of the RAM to guide gerontological research studies has been found to successfully contribute to this growing body of nursing science. Campbell (1992) studied the effect of diary writing on depression in a sample of community-based elders and found a significant decrease in depressive thoughts and ideation among elders who participated in the diary writing intervention. Using concepts from the RAM, Campbell defined the focal stimulus in this study as any negative thought processes that contribute to the onset and maintenance of depressive behavior in older adults. This conceptualization was confirmed in the diary writings of elders as they conveyed positive and negative thoughts about their past and present situations. Negative thoughts about deteriorating health, loss of

independence, death of spouses, and expressed unhappiness with their treatment by family and friends were found to contribute to the development and maintenance of depression among these elders. Nursing interventions included assisting the elders in identifying negative thought patterns and promoting more positive ideation. Campbell concluded that the RAM provided the nursing structure that guided the interaction between the nurse and the elder participants.

Chen (1994) investigated the relationship between hearing loss, loneliness, and self-esteem in a sample of older adults. Chen conceptualized hearing loss as a focal stimulus and measured the elders' perception of their hearing handicap as a cognator coping function. The amount of loneliness experienced among the elders and their levels of self-esteem were conceptualized as behavioral outcomes (e.g., interdependency and self-concept modes) and determined the effectiveness of the cognator coping function. Chen found that elders with higher levels of hearing handicap reported higher levels of loneliness and had lower self-esteem scores than elders with lower levels of hearing handicap. Thus, Roy's theoretical framework supported the hypothesized relational statements of this study.

McGill and Paul (1993) studied the effects of cancer (e,g., focal stimulus) on functional status and hope among older adults and found that more education, financial security, and better physical health predicted higher levels of hope in this population. This predictive model was congruent with the propositions of RAM; contextual stimuli can have a positive or negative effect on the focal stimuli (Roy & Andrews, 1999).

Calvert (1989) and Francis, Turner, and Johnson (1985) examined the effect of human-pet interactions (e.g., environmental contextual stimuli) on the psycho-social well-being (e.g., self-concept and interdependence modes) among institutionalized elders. These studies found that residents who interacted and cared for pets were less lonely, had higher life satisfaction scores, were less depressed, and reported being happier than residents who did not interact with pets. Both studies used key concepts and the conceptual framework of the RAM to investigate these relationships.

Preston and Dellasega (1997) examined the relationship between age-related stress and self-reported health in elderly married men and unmarried men/women. These authors used the four behavioral modes from the RAM to develop their argument for how age-related stress in married women can affect their self-reported health. Preston and Dellasega hypothesized that married women would experience the most stress because of a) menopausal changes (e.g., physiological and self-concept stresses), b) empty nest syndrome (e.g., role performance stress), c) having a greater potential for caring for an ailing spouse (e.g., physiological stress), and d) the high rate of widowhood in this population (e.g., interdependence stress). Their findings supported the propositions and relational statements in the RAM and the research hypothesis in this study.

Finally, Houston (1993) used the RAM to framework a study that investigated the physiological effects of rocking in the elderly. Houston was interested in whether rocking elicited a relaxation response in elders. Houston found that

rocking in this population did not elicit a relaxation response (e.g., significant decreases in heart rate, blood pressure, and temperature), but actually increased these physiological parameters, which is consistent with the body's response to exercise. Findings from this study did not support the author's hypothesis however, the results were consistent with propositions from the RAM. In addition, a suggested nursing implication from these findings was that active rocking might be used as a form of low-exertion exercise for frail and functionally disabled older adults.

Support for using the RAM as a framework for gerontological nursing research is evident from the studies presented above. Successful adaptation to age-related changes is vital to the maintenance of health and well-being in late life. The RAM does provide a holistic framework that identifies the interrelatedness of mind, body, and spirit as adaptive processes that promote human and environmental integration across the life span (Roy and Andrews, 1999).

<u>Conclusion</u>

Untreated or poorly managed pain is a significant and multidimensional problem in late life that negatively affects individuals physically, psychologically, socially, and spiritually. Therefore, it is necessary that the approach to pain management be holistic and include pharmacological and non-pharmacological interventions. Research findings indicate that the use of more adaptive coping strategies as a non-pharmacological intervention in pain management is linked to better physical and mental health outcomes. A high percentage of older adults have reported using religious coping strategies to prevent or eliminate the

negative effects of medical illness and chronic arthritic pain. However, it is difficult to determine whether religious coping is an adaptive or maladaptive coping strategy in older adults because of the disparate findings presented in the research literature. This study hoped to clarify some of the issues that are identified in the proposed study hypotheses and research questions.

Chapter III: Methods

Research Design

The purpose of this study was to explore the use of religious and non-religious coping strategies to manage chronic pain among elderly adults and the influence of these strategies on health outcomes. A cross-sectional, correlational survey design was used to investigate the research questions and to test a middle-range theory of adaptation to chronic pain using structural equation modeling in a sample of community dwelling older adults. This study examined the relationships between chronic pain, religious and non-religious coping, and the health outcomes of functional ability, depression, and spiritual well being. Participants for this study were drawn from a racially diverse metropolitan area in the Midwest.

A feasibility study that included six participants was conducted prior to data collection for instrument clarity and presentation. Participants were asked to time how long it took them to complete the survey, and to indicate whether any questions were unclear or confusing. Participants stated that it took them approximately 20 to 30 minutes to complete the survey and that questions were easily answered. One participant suggested that I add "no pain" as a scale item to one of the pain questions that asked if they had pain right now. The participant stated that they had pain in the morning until taking prescribed arthritic pain medication, and had no pain at this time interval. This scale item was then added to reflect current pain that was controlled. Of the six participants, data from five

participants were used in the total sample. The excluded participant had no pain, but agreed to fill-out the survey to assess for clarity and instrument presentation.

Sample and Sampling

A convenience sample of community-dwelling adults, 65 years of age and older, were recruited from 11 senior centers, two senior apartment complexes, one Health-O-Rama, and one volunteer center. Computer searches (e.g., www.seniorhousing.net and comnet.org/detroiteldernet) of all independent living senior-housing facilities in the Detroit Metropolitan area were used to identify possible data collection sites. Chosen research sites were located within a 30-mile radius of the City of Detroit. Sixteen sites were contacted; two sites from the city of Detroit, one site north of Detroit, one site east of Detroit, six sites west of Detroit, and five sites south of Detroit. Of these sites, only one refused to authorize permission to use their facility to recruit participants for the study. Inclusion criteria included seniors:

1. 65 years of age or older,

2. with chronic pain (e.g., pain of at least 3 months duration),

3. who were Judeo-Christian, (e.g., Catholic, Protestant, or Jewish).

Exclusion criteria included seniors that were cognitively impaired (e.g., unable to report 10 or more animals on the Animal naming test) (Bank, MacNeill, & Lichtenberg, 2000).

Power Analysis and Sample Size

Estimating statistical power in structural equation models (SEMs) has not been well established, however, various methods have been identified in the

research literature. Power is an important issue in SEM because it is influenced by sample size and misspecification errors (e.g., poorly designed model), the latter of which is not typically known by the researcher. Large sample sizes can magnify the effects of small specification errors, which is likely to generate a significant model chi-square, and result in the rejection of a true model. Small sample sizes can mask the effect of large specification errors, resulting in a non-significant chi-square and acceptance of a model that should be rejected. Therefore, having sufficient power is essential in the prevention of committing type I and type II errors (Tanaka, 1987).

The method developed by MacCallum, Browne, and Sugawara (1996) was used to determine the sample size and power estimate in this study. MacCallum and associates used an inferential approach to the assessment of model fit that measured the root-mean-square error of approximation (RMSEA; Steiger & Lind, 1980). This approach uses confidence intervals (CIs) and hypothesis testing to estimate the fit of the model in the population. In other words, if the fit index of the model is contained in the CI, the hypothesis is not rejected. If the fit index of the model falls outside the CI, the hypothesis is rejected. These authors further suggest that it is unlikely that any hypothesized model will be an exact fit in the population and that one could best expect to obtain a close approximation of the real-world relationships and effects. Therefore, a close approximation of fit was used to calculate the power and sample size.

The formula used by MacCallum and colleagues (1996) to determine whether the sample size (N) is large enough is based on the degrees of freedom (df) of

the hypothesized model. For example, a very large CI will be obtained if your sample size and df are small, reducing power. In this situation, when df are small, a large N is required to narrow the CI. If your df are high, however, then a moderate N can be used to obtain a rather narrow CI. The formula for calculating df is:

$$d = \frac{p(p+1)}{2} - q$$

where d is the df, p is the number of manifest variables (e.g., exogenous and endogenous variables), and q is the number of parameters to be estimated. The number of manifest variables in this study was 18 and the number of parameters to be estimated was 49. Therefore, the degrees of freedom for this study were 122.

$$122 = \frac{18(18+1)}{2} - 49$$

Based on 122 degrees of freedom, having a sample size of 200 or more will yield a power estimate of 0.955 for testing a model of close fit (MacCallum et al., 1996).

Another method of estimating power with SEMs is based on a general "rule of thumb". In this approach, the guideline of 10 cases per manifest variable is used. (Tanaka, 1987). Using this approach, the model with 18 manifest variables would require a sample size of 180. Thus, the two approaches yield similar sample size estimates.

Two hundred and twelve seniors were interviewed for this study. However, because of missing data on inclusion criteria variables (e.g., religion and pain

duration), reported pain under three months duration, and being under 65 years of age, only 200 cases fit the inclusion criteria and were included in the study.

Procedures

The Principal Investigator of the study contacted site directors and an explanation of the study was given. Institutional agreement to participate was verbally obtained and documented with a signed letter of agreement (see Appendix A). Dates and times were established to visit the site, post flyers (see Appendix B), participant recruitment, and data collection. Site directors were asked to provide a quiet room with adequate lighting, tables, and chairs for data collection purposes. Sessions were scheduled in the morning between breakfast and lunch (e.g., 10:00 am) and in the afternoon around 1:00pm.

Data collection began with the researcher giving an informational talk to potential participants in a group format. The informational talk allowed the investigator to meet with potential participants and discuss the specific aims and ethical considerations of the study. An information sheet was given to each participant prior to data collection that included an explanation of the study, provided contact information for the researcher, described potential risks, and assured confidentiality (see Appendix C). Seniors willing to participate in the study verbally stated an understanding of the information sheet provided on this sheet prior to survey administration. Completion of the questionnaire indicated that the participants consented to be in the study.

Elders willing to participate were then asked to fill out a questionnaire (see Appendix D) that took approximately 30 minutes to complete. This measure was

administered to the participants in a group format. Research assistants (RAs) were present to help participants who requested assistance because of visual or writing difficulties. Assistants were trained to use a standardized interview format (e.g., read only what is printed on the questionnaire).

To assess the cognitive status of each participant, the RAs asked each participant, prior to survey administration, to name as many different animals as possible within one minute (e.g., Animal Naming test). Among Alzheimer's patients, animal naming scores have been found to distinguish between mild and severe impairment (Binetti et al., 1995). Fewer than ten animals cited in one minute was used as the cutoff score, and is suggestive of cognitive impairment (Bank, MacNeill, & Lichtenberg, 2000). The numbers of animals named were tallied on a cover-page that was paper clipped to the front of each survey.

One participant was unable to name ten or more animals in one minute and was excluded from the study. The participant was politely informed that they were ineligible to participate in the study because the investigators had determined filling out the questionnaire maybe too burdensome for some people (see Appendix E). Participants who were able to name ten or more animals within one minute were given the questionnaire and were included in the study. Upon completion of the research questionnaire, participants were given a $5.00 gift certificate from CVS pharmacy and promptly thanked for their time.

Ethical Considerations

Wayne State University Institutional Review Board (IRB) approval was obtained prior to data collection (see Appendix F for a copy of the original

approval, continuation approval, and amendment approval forms). Detailed

description of the IRB approved procedure was presented in the previous

section. This study attempted to represent the ethnic and cultural diversity found

among older adults in the Detroit Metropolitan Area. According to the 1990 US

census, the age-by-sex-by-race distribution of elders over 75 years of age was

27% White Males, 56% White Females, 6% Black Males, and 11% Black

Females. The age-by-sex-by-race distribution of elders 65 and older in this study

was 19.5% (n = 39) White Males, 60% (n = 120) White Females, 3.5% (n = 7)

Non-White Males and 17% (n = 34) Non-White Females.

Data Preparation

To ensure that the assumptions of multivariate analyses were not violated,

data preparation included procedures that dealt with missing data, assessment of

multivariate normality, and absence of multicollinearity. Procedures used to

address these issues are described below.

Missing data analyses and estimation. Missing data was analyzed first to

determine if the missing cases were random. According to Hertel (1976), if 15%

or more of the participants are missing data on any one variable, then the

missing cases are not considered random, and the variable may be excluded

from the analysis. In this study, two items from the Jette Functional Status Index

Scale (FSI) were found to have missing cases that were not considered random.

Further discussion will follow in the measure section addressing these FSI scale

items. All other missing data were determined to be random, however, and were

handled using mean imputation (e.g., replacing a missing value with the sample mean of available data) (Allison, Gorman, & Primavera, 1993).

Mean percentages of missing data for each scale was calculated by summing the percentages of missing data per item and dividing it by the total number of items in the scale. The mean percent of missing data for the Pain Coping Scale was 2.09% (range = .5% - 5.2% per item); 1.53% for the Religious Coping Scale (range = .5% - 3.8% per item); 1.14% for the Jette FSI (range = .5% - 8.0% per item); 1.63% for the Geriatric Depression Scale (range = .9% - 2.8% per item); and 1.19% for the JAREL Spiritual Well-being Scale (range = .5% - 2.8%). According to Cohen and Cohen (1983), mean imputation is acceptable if scales are determined to have random, missing data that is less than five to ten percent.

The web page (e.g., www.stanford.edu/~yesavage/GDS.html) for the Geriatric Depression Scale (GDS) provided the scoring procedure for the missing data on the GDS short-form (Yesavage, 2001). This procedure involved estimating scores based on existing data. For example, if a participant completed 12 of the 15 items and scored a four (e.g., reported yes on four items), they were considered to have 1/3 positive responses. One third of a point was then added to each of the three missing items, thus adding one point to the total GDS score. This formula was used to replace the missing data for the GDS.

Multivariate normality. Skewness and kurtosis statistics were assessed using histograms to determine univariate normality. Skewness estimates the symmetry of the distribution around the mean and kurtosis estimates the proportion of scores in the middle of the distribution, or in its tail, relative to those in a normal

curve (Kline, 1998). According to Li and colleagues (1998), an absolute value of two for skewness and seven for kurtosis is considered a significant departure from normality.

Skewness and kurtosis statistics in this study fell well below the absolute values of two for skewness and seven for kurtosis. The total Geriatric Depression Scale (GDS) score histogram, however, illustrated a positively skewed distribution (e.g., most of the cases below the mean) (skewness = 1.62, kurtosis = 2.77). Therefore, a square root transformation on the total GDS mean score was done that produced a histogram with a distribution much closer to normal (skewness = .22, kurtosis = -.64). According to Kline (1998), square root transformations normalize positively skewed distributions by pulling outlying scores closer to the center of the distribution.

Multicollinearity. The last assumption that was addressed was to assess for the absence of multicollinearity. Multicollinearity occurs when intercorrelations among some variables are too high, making certain mathematical calculations impossible to run or creating estimates that are considered unstable (Kline, 1998). According to Kline, bivariate multicollinearity can be easily identified in correlation matrices. For example, any bivariate correlation exceeding .85 may be considered redundant. In this study, the correlational matrix revealed bivariate correlations above .85 with total composite score variables computed with their respective subscales. For instance, the bivariate correlationship between behavioral coping subscale and the total pain coping scale score was .90 because the items in the behavioral coping scale are a part of the total pain

coping scale score. Therefore, a high correlation between these items is expected and is not considered multicollinearity (Kline, 1998). Similar scores were found among the religious coping subscales and total scores, and the functional status index subscales and total scores. All other bivariate correlationships were below .85 (see Table 2).

Insert Table 2 about here

Data Analyses

Descriptive statistics of the sample and measures were computed that included frequencies, means, reliability estimates, and confirmatory factor analyses. Bivariate correlations and t-tests were computed to answer research questions one through five and their respective hypotheses.

Structural equation modeling (SEM) was used as the statistical technique to analyze the proposed middle range theory of adaptation to chronic pain. SEM was chosen because this technique examines the covariances or correlations among proposed variables to determine if the hypothesized relationships between concepts within the model are plausible. It is a statistical technique that allows researchers to gain an understanding of how concepts relate to each other with an underlying assumption that a possible causal relationship exists between concepts (Ratner, Bottorff, & Johnson, 1998).

According to Bollen and Long (1993), there are five steps in the process of SEM: model specification, identification, estimation, testing fit, and

respecification. By including respecification as a step in the SEM process, the researcher acknowledges that the proposed model may not fit the data; therefore the model should be modified and retested using the same data. Thus, this SEM approach can be conceptualized as a "model generating" rather than just a model testing technique (Joreskog, 1993).

Specifying models. The first step in the SEM process is the specification or formulation of a model that is based on research findings and theory. The specified model is a representation of the theoretical relationships between the unobservable or latent concepts (e.g., structural equation component) and the connections between the latent concepts and the measured manifest variables (e.g., measurement component) (Ratner, et al., 1998).

The specified model for this study was presented in the first chapter (see Figure 2). A baseline "measurement model" with all paths in the specified model set to correlate was used as a comparison model that best fits the data. Allowing all paths in the measurement model to correlate and be estimated freely does not provide any theoretical or empirically sound information. The measurement model does, however, provide baseline fit indices that were compared with the proposed and respecified models.

Identification. The next step in the SEM process is to determine whether the proposed model is adequately identified. Identification in SEM is a problem when the researcher has proposed more coefficients or effects to be estimated relative to the number of variances and covariances in the data set (e.g., underidentification). The desired SEM is the overidentified model that estimates

fewer coefficients than the number of observed variances and covariances. The formula that is used to determine identification is:

$$t < \tfrac{1}{2}(p + q)(p + q + 1)$$

where t is the number of coefficients for paths to be estimated in the proposed SEM, p is the number of endogenous variables, and q is the number of exogenous variables (Carmines, 1986). In the proposed model, there are fifteen endogenous variables and three exogenous variables. Therefore, the calculation is as follows:

$$\tfrac{1}{2}(15 + 3)(15 + 3 + 1) = 171$$

In this model, the number of distinct parameters to be estimated was 49, which is less than the number of observed variances and covariances estimated to be 171. Thus, the proposed SEM model was an overidentified model.

Estimation. The third step in the SEM process is to choose what model-fitting program to use. Maximum likelihood (ML) estimation was the default method used to test the model-fit of the proposed model. The ML method estimates all model parameters simultaneously, and statistically assumes that these parameters are population values that maximize the likelihood or probability that the data (e.g., observed covariances) were drawn from this population (Kline, 1998).

Testing model fit. Testing model fit is the next step in the SEM process. The goal of SEM is to determine statistically if the relationships in the proposed model are compatible with the data variance and covariance matrix. Various goodness of fit tests, or "fit indices", were used to determine if the proposed model

covariance structure is different from the observed relationships. The Pearson chi-square (χ^2) statistic with degrees of freedom that are equal to the difference between the number of observations and parameters is the most basic fit index. Low and non-significant values of the χ^2 index are desired because it indicates that the proposed model does not differ significantly from an estimated just-identified model (e.g., model having equal coefficients to be estimated as the number of observed variances and covariances). The χ^2 statistic however, is very sensitive to large sample sizes and may give a significant result even though the difference between the observed and model-implied covariances are not significant. To reduce the sensitivity to sample size, some researchers divide the χ^2 statistic by the degrees of freedom (e.g., χ^2/df) generating a lower value. A general "rule of thumb" is that if the χ^2/df ratio is less than three than the model fit is minimally acceptable (Kline, 1998). Hair and colleagues (1998) have suggested that an "ideal fit" has a χ^2/df ratio of one, values between two and three are "good" and any value greater than five is "unacceptable."

Other researchers have addressed the χ^2 limitation by developing goodness of fit indices that are less sensitive to sample size. For example, the goodness of fit index (GFI), normed fit index (NFI), incremental index of fit (IFI), and comparative fit index (CFI) with values close to .95 are representative of "an adequate fit" to the data. The root mean square error of approximation (RMSEA) with values less than .05 is indicative of a "good fit," values ranging from .08 to .1 is indicative of a "mediocre fit," and values greater than .1 is indicative of a "poor fit". Choosing the model with the lowest Akaike's information

criterion (AIC) is indicative of the best fit to the data (Byrne, 2001). The formula to calculate AIC is as follows;

$$AIC = \chi^2 - 2df$$

Thus, models with few degrees of freedom (e.g., the more complex models) get larger reductions in the χ^2 values (Kline, 1998). These fit indices were used to assess the baseline measurement and the proposed models fit to the data.

Respecification. The last step in the SEM process is respecification. If the proposed model fits poorly, then the model should be modified and retested with the aim of generating a model that best fits the data (Ratner et al., 1998). In this study, statistical significance of parameter estimates was examined first and non-significant paths were incrementally deleted from the model. A parameter estimate with a critical ratio (CR) that is $>\pm1.96$ is considered a significant path (Byrne, 2001). Incremental deletion of each non-significant path was done and the model tested for fit. The $\chi2$ change between the baseline measurement model and each model was tested for significance using this formula:

$$\begin{array}{c} \text{New model } \chi^2 \text{ df} \\ \underline{\text{- Old model } \chi^2 \text{ df}} \\ \chi^2 \text{ and df change} \end{array}$$

A χ^2table (Hays,1994) was then used to determine if the χ^2 and df change was statistically significant. Similarly, the significance of the χ^2change between a newly specified model and the previous model was evaluated.

After all non-significant paths were deleted from the proposed model, the comparison between the measurement model and the last model evaluated was still found to be significantly different. Therefore, modification indices were

examined to determine if any additional paths could be added that would

significantly reduce the χ^2 statistic. Modification indices indicate how much a

particular coefficient is expected to change if the path is freed to estimate

(Ratner, 1998). Significant paths were then added to the model until a non-

significant χ^2 statistic was calculated (see Table 16 on page *).

Data was analyzed using SPSS Base 8.0 software (SPSS, 1998) and Amos

4.0 (Amos, 1995-1999). The level of significance for each test was pre-set at

0.05.

Measures

The measures described below follow the order in which they were presented

in the actual instrument (see Appendix D for copy of the Pain and Coping in

Elders (PACE) survey). The measures that were used in this study are linked

with the study variables and summarized in Table 3 on page 79. Specific

information about each measure in the research questionnaire will be presented,

followed by sample descriptive statistics. Formatting of each scale was modified

from the original version for ease of completion by elders, and to minimize writing

across all measures. In addition, the questionnaire was developed to

accommodate age-related changes in older adults by using white paper to

increase contrast, and 14-point font to facilitate reading. Literacy level of the

questionnaire was assessed at approximately the fourth grade using Microsoft

Windows98 (1999).

Section 1: Background contextual information. Participants were asked to

provide general demographic data (e.g., age, gender, race, marital status, level

of education, and religion) (Dunn & Horgas, 2000). Gender, marital status, race (e.g., nominal variables) and level of education (e.g., ordinal variable) were assessed using a checklist format. Participants were then asked to write in their age (e.g., continuous variable) and religion (e.g., nominal variable). Age, gender, and race were included in the proposed model as background contextual factors. The participants' marital status, level of education, and religion were asked for descriptive purposes. Religion and age were also used as validity checks of adherence to inclusion criteria.

Sample characteristics. Two hundred community-dwelling elders who met the inclusion criteria comprised the convenience sample of this study. The mean age of the sample was 76.36 ($\underline{SD}$ = 6.55), ranging from 65 to 97 years. Elders, on average, were able to name approximately 16 animals in one minute, with scores ranging from 10 to 30 per minute. Thus, all participants were considered cognitively intact. Seventy-seven percent of the sample were female (n = 154) and 23% were male (n = 46). The majority of elders were White/Caucasians (n = 159, 79.5%) followed by African Americans (n = 38, 19.0%), Asians (n = 1, 0.5%), American Indians (n = 1, 0.5%), and Bi-racials (n = 1, 0.5%). To avoid statistical problems with outliers and for parsimony, race was recoded to two categories: White and Non-White. Approximately one half of the elders reported being widowed, while 31.5% (n = 63) were married. Over three-quarters of the sample elders had an education level of high school or more, with less than a quarter having less than a high school education. With regard to religious affiliation, Protestant religions were reported most often by elders (n = 113,

56.5%) followed by Catholics (n = 76, 38%), Jews (n = 4, 2%),

Evangelists/Fundamentalists (n = 3, 1.5%), and Others (e.g., Mormons, Jehovah

Witness) (n = 4, 2.0%) (see Table 4). Thus, all participants were considered to

have religious beliefs that had historical roots in Judaism and/or Christianity (e.g.,

Judeo-Christians) (Merriam-Webster, 2001).

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Insert Table 4 about here

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Section 2: Pain questions. Four dimensions of self-rated pain were measured:

presence, duration, location, and intensity. The presence of pain was assessed

using a dichotomous scale (e.g., 0 = no and 1 = yes). To assess for pain

duration, participants were asked to write in the number of months or years they

have had pain. Years of pain were then recoded to months providing a

continuous variable for data analysis. A pain map was used to identify painful

body location(s). The pain map is pictorial representation of the front and back of

a human body. Participants were asked to place an X on all painful body

locations and to circle the most painful site. Thirty-four specific body locations

(e.g., head, neck, right and left shoulders, chest, right and left upper arms, right

and left elbow, ect.) were identified for scoring purposes. For parsimony, the 34

body locations were recoded into six generalized locations (e.g., head, upper

extremities, chest and abdomen, hip, back, and lower extremities) (Lichtenstein,

Dhanda, Cornell, Escalante, & Hazuda, 1998). A Verbal Descriptor Scale (VDS)

assessed the level of pain intensity on a six item scale, in which 0 = "no pain"

and 5 = "worst pain I can imagine" (Herr & Mobily, 1991). The VDS assessed

pain intensity using four reference points (e.g., average pain intensity in the last

week, worst pain intensity in the last week, least pain intensity in the last week,

and current pain). A comparative study of selected pain assessment tools

frequently used with older adults found the VDS to be the easiest to complete

and the most descriptive of their pain (Herr & Mobily, 1992). Summing the

average, worst, and least pain intensities during the last week created a total

pain intensity index that was conceptualized as the focal stimulus in the proposed

model. The presence of pain and pain duration were used as validity checks of

adherence to the inclusion criteria. Assessment of all painful body locations was

measured for descriptive purposes.

Self-reported chronic pain experienced by elders. On average, seniors in

the sample reported experiencing moderate pain (M = 3.00, SD = .85,

Range = 1-5) in the last week. The mean worst pain experienced in the last week

was moderate (M = 3.16, SD = .89). The least level of pain reported by the elders

was mild (M = 2.28, SD = 1.02), as was their current pain (M = 2.00, SD = 1.31).

The mean total pain intensity was 8.45 (SD = 2.35), ranging from three to fifteen.

Cronbach alpha for the total pain intensity index was .80.

Of particular interest was the duration of pain these elders experienced. The

mean duration of pain was approximately 12 years (SD = 177.03) ranging from 3

months to 87 years (see Table 5). The mean number of painful body sites

reported by elders was 3.98 (SD = 3.29). The most frequently reported painful

body locations were the lower extremities (n = 130, 65%) followed by the hips (n

= 92, 46%), upper extremities (n = 83, 41%), head (n = 35, 18%), back (n = 33, 17%), and chest and abdomen (n = 20, 10%) (see Table 6).

Insert Tables 5&6 about here

Section 3: Pain coping strategies. Non-religious pain coping strategies (e.g., items 14-29) were assessed using a modified version of the Coping Strategies Questionnaire (CSQ) (Rosenstiel & Keefe, 1983) developed by Lin (1995). This measure uses seven items from the original 42-item CSQ: six cognitive coping strategies (e.g., diverting attention, distraction, reinterpreting pain sensations, using self-statements, ignoring pain sensations, praying or hoping, and catastrophizing) and one behavioral coping strategy (e.g., increasing activity levels). In addition to these seven items, Lin (1995) added two cognitive coping strategies (e.g., imagery and hypnosis) and seven behavioral coping strategies (e.g., report of pain to clinicians, use of pain medications, heat, cold, massage, relaxation, and exercise) from the Agency for Health Care Policy and Research (AHCPR) guidelines for cancer pain management (AHCPR, 1994). Thus, Lin's coping scale consists of eight cognitive (Cronbach alpha = .72) and eight behavioral (Cronbach alpha = .70) coping strategies.

Two modifications to Lin's coping scale were done in this study. The first was done on item number seven, "You engage in active behaviors which divert your attention away from the pain, such as watching TV or listening to music." Listening to music was deleted from this item, and then added to the scale as

another behavioral coping item (e.g., item 29). Research literature has supported the use of music therapy as a distinct therapeutic intervention in the management of pain (Good, 1995) and has been classified as a complementary/alternative therapy (Dossey, et al., 2000).

The second modification to Lin's coping scale was the removal of item number five, "I tell myself to hope and pray that the pain will get better someday." Most general coping scales have a single item, or a subscale, which measures some form of religious coping. The intended purpose of this scale was to measure how often participants use non-religious coping strategies to manage pain. Therefore, the operational definition of this measure would logically exclude this item from the scale. For these reasons, the final scale used in this study included seven cognitive (e.g., items 14-18, 26, and 28) and nine behavioral coping items (e.g., items 19-25, 27, and 29).

Respondents were asked to rate how often they have used each coping strategy when they felt pain during the last week. A seven-point scale was used (e. g., 0 = "never do it" to 6 = "always do it"). A cognitive coping score (with a potential range of 0 – 42) and behavioral coping score (with a potential range of 0 – 54) were computed by summing the scores for each subscale. A total non-religious coping score was calculated by summing the scores of the entire scale, yielding a potential range of 0 – 96.

Use of non-religious pain coping strategies. On average, elders reported using behavioral coping strategies (M = 26.13, SD = 11.30) to manage their pain

more often than cognitive coping strategies ($\underline{M}$ = 13.34, $\underline{SD}$ = 8.50). The most

frequently used behavioral strategy was "reporting pain to doctors or nurses"

($\underline{M}$ = 4.25, $\underline{SD}$ = 2.06), followed by "taking pain medication" ($\underline{M}$ = 3.87,

$\underline{SD}$ = 2.23), "diversion" ($\underline{M}$ = 3.60, $\underline{SD}$ = 2.13), "exercise" ($\underline{M}$ = 3.60, $\underline{SD}$ = 2.12),

and "heat" ($\underline{M}$ = 2.93, $\underline{SD}$ = 2.23). The most frequently reported cognitive coping

strategy was the "use of self-statements" ($\underline{M}$ = 3.76, $\underline{SD}$ = 2.14), followed by

"distraction" ($\underline{M}$ = 2.39, $\underline{SD}$ = 2.30), "ignoring the pain" ($\underline{M}$ = 2.22, $\underline{SD}$ = 2.21),

"reinterpreting the pain" ($\underline{M}$ = 1.68, $\underline{SD}$ = 2.06), and "catastrophizing"

($\underline{M}$ = 1.64, $\underline{SD}$ = 1.93). On average, total non-religious pain coping scores

reported by elders was 39.46 ($\underline{SD}$ = 17.35, $\underline{Range}$ = 0 - 90). Reliability estimates

of the total pain coping scale was Cronbach alpha = .81; for the behavioral

coping scale, Cronbach alpha = .74; and for the cognitive coping scale, Cronbach

alpha = .71 (see Table 7).

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Insert Table 7 about here

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First-order confirmatory two-factor analysis of the pain coping scale was

calculated using Lin's (1995) hypothesized model. Factor loadings

(e.g., standardized regression weights) in the cognitive coping subscale ranged

from .36 to .69 and from .35 to .60 for the behavioral coping subscale. In the

cognitive subscale, "catastrophizing" (β = .36) and "hypnosis" (β = .38) had the

lowest factor loadings. "Taking pain medication" (β = .35) had the lowest factor

loading in the behavioral subscale. Overall fit of the model was as follows:

χ^2 = 271.58, df = 103, p < .00, GFI = .85, NFI = .65, IFI = .75, CFI = .74,

RMSEA = .09, and AIC = 337.58 (see Table 8). Factor loadings and fit indices

indicated an acceptable fit to the data.

Insert Table 8 about here

Religious coping strategies. A modified situation-specific version of the short-

form Religious Problem-Solving Scale (RPS) (Pargamet, et al., 1988) was used

to measure the frequency with which respondents report using religious

strategies to cope with pain. The original measure was modified slightly by

changing the word "problem" into "pain" (e.g., "when I have pain, I talk to God

about it and together we decide what it means"). This modification is consistent

with the intent of the original measure, and was done with the author's

permission (Pargament, personal communication, December 12, 2000).

The short-form RPS (Pargamet, et al., 1988) is an 18 item scale (e.g., 31-48)

consisting of three religious coping style subscales: collaborative (e.g., items 31,

35, 36, 40, 43, and 48), self-directive (e.g., 33, 37, 38, 42, 44, and 47), and

deferring (e.g., 32, 34, 39, 41, 45, and 46). In the collaborative style, the person

and God share the responsibility for coping. In the self-directive style, the person

takes on the responsibility for coping him/herself. In the deferring style, the

individual places the responsibility for coping on God.

Participants were asked to rate how often they have used each coping activity

when they felt pain during the past week. Responses were scored on a five-point

Likert scale (e.g., 1 = "never used" to 5 = "always used"). Scoring included

reverse coding for six items (e.g., 33, 37, 38, 42, 44, and 47). A total religious coping score was calculated by summing the response items, yielding a range of 18 – 90 possible points. Similarly, a separate score for each subscale was calculated, yielding a range of 6 – 30 possible points per subscale. Cronbach alphas for the three subscales have been reported as .93 for collaborative, .91 for self-directive, and .89 for deferring (Pargamet, et al., 1988).

Use of religious coping strategies. On average, elders reported using collaborative strategies (M = 18.58, SD = 8.68) most often, followed by deferring strategies (M = 16.77, SD = 8.11) and self directive strategies (M = 13.17, SD = 6.73). Total use of religious coping score had a mean of 58.18 (SD = 19.04, Range = 18 - 90) (see Table 9). The most frequently reported collaborative strategy was "When I worry about pain, I work together with God to make sense of it" (M = 3.19, SD = 1.65), which indicates that most of the elders prayed for God to work along with them to manage their pain. "When deciding on what pain treatments to use, I make a choice without God's help" was the most frequently reported strategy in the self-directive subscale (M = 2.36, SD = 1.56). When deferring to God to manage pain, elders reported that the strategy "I don't spend much time thinking about the pain I've had; God makes sense of it for me" was used most often (M = 2.95, SD = 1.56). Cronbach alphas for the three subscales were .96 for collaborative, .85 for self-directive, and .93 for deferring. Cronbach alpha for the total religious coping scale was .93 (see Table 9).

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Insert Table 9 about here

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First-order confirmatory three-factor analysis of the religious coping scale was calculated using Pargament's (1988) hypothesized model. Factor loadings (e.g., standardized regression weights) ranged from .82 to .94 in the collaborative subscale, .59 to .88 for the self-directive subscale, and .76 to .91 for the deferring subscale. The item, "When I have pain, I deal with my feelings without God's help" (β = .59) had the lowest factor loading. Overall fit of the model was as follows: χ^2 = 358.37, $\underline{df}$ = 132, $\underline{p}$ < .00, GFI = .83, NFI = .89, IFI = .93, CFI = .93, RMSEA = .09, and AIC = 436.71 (see Table 10). Factor loadings and fit indices indicated an acceptable fit to the data.

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Insert Table 10 about here

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Section 4: Everyday functional activities. The Functional Status Index (FSI) (Jette, 1987) was used to measure the health-related functional status of the respondents. The FSI is an 18-item scale (e.g., items 49-66) that is used to assess five dimensions of functional ability. These dimensions include 1) a three-item gross mobility subscale (e.g., walking inside your home), 2) a three-item hand activities subscale, (e.g., opening containers), 3) a four-item personal care subscale (e.g., washing all parts of the body), 4) a four-item home chores

subscale (e.g., doing laundry), and 5) a four-item social/role activities subscale (e.g., driving a car). Internal consistency for the five subscales in a sample of 149 rheumatoid arthritis patients (mean age of 52 years) ranged between .66 to .90 (Jette, 1987).

Participants were asked to rate how much difficulty they experienced while doing these activities during the past week. Responses were rated on a 4-point Likert scale ranging from 1 = "no difficulty" to 4 = "severe difficulty" The FSI subscales were created by summing the item scores across all subscales and dividing by the total number of items, yielding a total mean score. Overall FSI score was calculated by summing all item scores and dividing by eighteen (Jette, 1987).

Self-reported degrees of difficulty performing everyday activities. Elders reported having the most difficulty with everyday mobility activities (M = 6.51, SD = 2.59), followed by personal care activities (M = 5.58, SD = 2.42), home chore activities (M = 5.28, SD = 2.15), hand activities (M = 4.55, SD = 1.91), and social role activities (M = 4.37, SD = 2.02). Seniors reported having the most difficulty "climbing stairs" (M = 2.55, SD = 1.11), "moving in and out of chairs" (M = 2.10, SD = 1.00), and reaching into low cupboards (M = 2.06, SD = 1.02). Item 13 (e.g., doing yardwork) was deleted from the home chore subscale because a high percentage of older adults (n = 47, 22.2%) reported that this item was not applicable. In addition, item 15 (e.g., driving a car) from the social role subscale was deleted because 35 older adults (16.5%) also reported that this item did not apply. The deletion of these two items was consistent with Hertel's (1976)

general rule: if 15% or more of the participants had missing data on any one variable, then the missing cases are considered non-random, and the variable may be excluded from the analysis.

The total score of the FSI scale had a mean of 26.28 ($\underline{SD}$ = 8.64), ranging from 16 to 61. Cronbach alpha for the total FSI scale was .90. Cronbach alphas for the five subscales were .81 for mobility, .68 for hand, .83 for personal care, .66 for home chores, and .76 for social roles (see Table 11).

Insert Table 11 about here

First-order confirmatory five-factor analysis of the FSI scale was calculated using Jette's (1987) hypothesized model. Factor loadings (e.g., standardized regression weights) ranged from .73 to .78 in the mobility subscale, .60 to .86 for the hand subscale, .69 to .80 for the personal care subscale, .59 to .67 in the home chores subscale, and .71 to .85 for the social roles subscale. Overall fit of the model was as follows: χ^2 = 255.48, $\underline{df}$ = 94, $\underline{p}$ < .00, GFI = .87, NFI = .84, IFI = .89, CFI = .89, RMSEA = .09, and AIC = 339.48 (see Table 12). Factor loadings and fit indices indicated an acceptable fit to the data.

Insert Table 12 about here

<u>Section 5: Feelings/Geriatric Depression Scale.</u> The short-form Geriatric Depression Scale (GDS) (Yesavage, et al., 1982-83) (e.g., items 67-81) was used to assess the presence of depressive symptoms in the respondents. This brief, self-report depression scale was designed specifically for use with older adults. Burke, Roccaforte, and Wengel (1991) found that, among cognitively intact elders, the short form GDS had a sensitivity score of 67% and a specificity score of 78%.

Respondents were asked to answer yes or no to the items that best described how they felt over the past week. Examples of item questions are 1) "Are you basically satisfied with your life?" 2) "Do you feel that your life is empty?" 3) "Do you feel happy most of the time"? Scoring the GDS consisted of reverse coding for six items (e.g., 67, 71, 73, 77, 79, and 81) and summing all 15 items to yield one total depression score. A GDS score of five or more is indicative of depression (Yesavage, 2001).

<u>Self-reported depressive feelings among elders.</u> On the GDS, participants had a mean score of 2.47 (<u>SD</u> = 2.6, <u>Range</u> = 0-15. Cronbach alpha for the GDS was .79 (see Table 13).

Insert Table 13 about here

<u>Section 6: JAREL spiritual well-being scale.</u> Spiritual well-being was assessed using the JAREL Spiritual Well-being Scale (e.g., items 82-102) (Hungelmann, Kenkel-Rossi, Klassen, & Stollenwerk, 1996). This 21 item scale is composed of

three, seven-item subcales. The first subscale (e.g., items 82-87, 89) measured a faith/belief dimension that examined purpose in life, the relationship between spiritual beliefs and life style, and belief in a Supreme Being. The second subscale (e.g., items 88, 93, 95, 98, 99, 101, and 102) measured life/self-responsibility or the lack of a belief in a Supreme Power and difficulty in forgiving others. The third subscale (e.g., 90-92, 94, 96, 97, and 100) measured life satisfaction/self actualization or an acceptance of life situations and the ability to have loving relationships with others. Cronbach alpha for the JAREL among a sample of 114 older adults was .91 (DeCrans, 1990).

Respondents were asked to choose how much each statement described their beliefs in the last week. Responses were chosen from a 6-point scale ranging from 1 = "strongly disagree" to 6 = "strongly agree". Reverse scoring was done for seven items (e.g., 88, 93, 95, 98, 99, 101, and 102). Each subscale was summed to yield a score with a possible range of 7 – 42. A total spiritual well-being score was calculated by summing all 21 items to create a score with a possible range of 21 – 126.

Self-reported agreement ratings of the JAREL Spiritual Well-being Scale. On average, seniors reported that they agreed with the statements in the faith/belief subscale most often (M = 35.80, SD = 7.09), followed by the life satisfaction (M = 35.36, SD = 5.82) and self –responsibility subscales (M = 16.05, SD = 7.02). Total spiritual well-being score had a mean of 87.21 (SD = 11.67, range = 34 - 123). The majority of seniors reported "an ability to give and receive love" (M = 5.45, SD = 1.11), "a belief in a Supreme Power"

(M = 5.38, SD = 1.25), and "satisfaction with their lives" (M = 5.28, SD = 1.14).

Cronbach alpha for the total spiritual well-being scale was .85. Cronbach alphas

for the three subscales were .87 for faith/belief, .68 for self-responsibility, and .78

for life satisfaction (see Table 14).

Insert Table 14 about here

First-order confirmatory three-factor analysis of the JAREL spiritual well-being

scale was calculated using Hungelmann and associates (1996) hypothesized

model. Factor loadings (e.g., standardized regression weights) ranged from .50

to .84 in the faith/belief subscale, .36 to .65 for the self-responsibility subscale,

and .39 to .66 for the life satisfaction subscale. "I can't accept change in my life

(β = .36), "when I am sick I have less spiritual well-being" (β = .37), and "I set

goals for myself" (β = .39) had the lowest factor loadings. Overall fit of the model

was χ^2 = 507.26, df = 186, p < .00, GFI = .79, NFI = .71, IFI = .79, CFI = .79,

RMSEA = .09, and AIC = 597.26 (see Table 15). Factor loadings and fit indices

indicated an acceptable fit to the data.

Insert Table 15 about here

Table 2

<u>Correlations between the Exogenous and Endogenous Variables.</u>

	1	2	3	4	5	6	7	8	9	10	11	12	13
[1] Gender	1.000***												
[2] Race	.07	1.000***											
[3] Age	-.04	-.04	1.000***										
[4] Total Pain	.12	.01	.12	1.000***									
[5] Cognitive Coping	.11	.07	.07	.21**	1.000***								
[6] Behavioral Coping	.13	.12	.03	.31**	.53**	1.000***							
[7] Total Pain Coping	.14	.11	.05	.30**	.83**	.91**	1.000***						
[8] Collaborative Coping	.19**	.39**	.17	.22**	.33**	.43**	.44**	1.000***					
[9] Self-Directive Coping	.01	.13	.00	-.10	-.04	-.06	-.06	.24**	1.000***				
[10] Deferring	.22**	.35**	.03	.17*	.30*	.39**	.40**	.89**	.23**	1.000***			
[11] Religious Coping	.18**	.37**	.06	.14*	.26**	.34**	.35**	.91**	.56**	.91**	1.000***		
[12] Faith Belief	.16*	.21**	-.19**	-.05	.11	.20**	.18	.47**	.16*	.47**	.47**	1.000***	
[13] Self-Responsibility	-.00	.17*	-.15*	-.07	-.11	.06	-.02	.24**	.28**	.25**	.32**	.30**	1.000***

*p < 0.05 (2-tailed); ** p < 0.01 (2-tailed)

Table 2 cont.

<u>Correlations between the Exogenous and Endogenous Variables.</u>

	1	2	3	4	5	6	7	8	9	10	11	12	13
[14] Life Satisfaction	.12	.14*	-.10	-.00	.14*	.18*	.19**	.27**	.03	.30**	.22**	.62**	.22**
[15] Total Spiritual Well-Being	.12	.23**	-.19**	-.05	.05	.19**	.15*	.43**	.21**	.45**	.46**	.84**	.69**
[16] Mobility Mean Score	.20**	-.07	.09	.51**	.13	.28**	.24**	.12	-.04	.15*	.11	-.08	-.07*
[17] Hand Mean Score	.31**	-.06	.13	.24**	.12	.18**	.18*	.08	-.14*	.10	.03	-.03	-.11
[18] Personal Care Mean Score	.14	-.04	.19**	.35**	.21*	.23**	.25**	.12	-.14*	.12	.05	-.07	-.15*
[19] Home Chores Mean Score	.20**	-.13	.11	.44**	.15*	.28**	.25**	.12	-.10	.14*	.08	-.07	-.08
[20] Social Roles Mean Score	.03	-.05	.18**	.45**	.20*	.24**	.26**	.14*	-.15*	.08	.05	-.11	-.27*
[21] Functional Ability Score	.22**	-.09	.18*	.52**	.21*	.31**	.31**	.15*	-.14*	.15*	.08	-.09	-.16*
[22] Depression Score	.02	-.16*	.22**	.28**	.06	.08	.08	-.06	-.18*	-.13	-.14*	-.22**	-.24**

* $p < 0.05$ (2-tailed); ** $p < 0.01$ (2-tailed)

Table 2 cont.

Correlations between the Exogenous and Endogenous Variables.

	14	15	16	17	18	19	20	21	22
[14] Life Satisfaction	1.000 ***								
[15] Total Spiritual Well-Being	.77	1.000 ***							
[16] Mobility Mean Score	-.07	-.09	1.000 ***						
[17] Hand Mean Score	.02	-.05	.13	1.000 ***					
[18] Personal Care Mean Score	-.09	-.14	.19**	.57**	1.000 ***				
[19] Home Chores Mean Score	-.02	-.08	.11	.52**	.61**	1.000 ***			
[20] Social Roles Mean Score	-.06	-.05	-.17*	.32**	.50**	.59**	1.000 ***		
[21] Functional Ability Score	-.06	-.09	-.14	.69**	.81**	.86**	.76**	1.000 ***	
[22] Depression Score	-.29**	-.16*	-.32**	.21**	.25**	.30**	.39**	.35**	1.000 ***

* p < 0.05 (2-tailed); ** p < 0.01 (2-tailed)

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Table 3

Theoretical Constructs, Study Variables, Operational Definitions, and Study Measures

Constructs	Variables	Operational Definitions	Instruments (Level of Measurement)
Stimuli -Contextual -Focal	 Age, Gender, Race Total Pain Intensity	 Age, gender, and race of the participant. Self-reported summation of the average, worst, and least pain intensities experienced by the participant in the last week.	Demographic Data: -Age (interval) -Gender (categorical) -Race (categorical) Verbal Descriptor Scale (interval)
Compensatory Life Processes Coping	 Religious Coping Non-Religious Coping	The number of coping strategies that use religious beliefs or behaviors to prevent or reduce the negative physical and emotional correlates of stress associated with chronic pain the participant's report using in the last week. The number of non-religious cognitive or behavioral coping efforts used to prevent or reduce the negative physical and emotional correlates of stress associated with chronic pain that participants report using in the last week.	Religious Problem-solving Scale (interval) Pain Coping Strategies (interval)
Adaptive Modes -Physiological Mode -Psychological Mode	 Functional Ability Depression Spiritual Well-being	 The perceived level of difficulty in performing activities of daily living due to pain in the past week. The number of self-reported depressive symptoms felt in the last week. The perceived level of spiritual well-being in the last week.	 Functional Status Index (interval) Geriatric Depression Scale (interval) JAREL Spiritual Well Scale (interval)

Table 4

Background Contextual Description of the Sample (N = 200).

Variable	n	%	Mean	S.D.	Range
Age			76.36 yrs	6.55	65 – 97yrs
Animal Naming			15.85	4.24	10 - 30
Gender					
Male	46	23.0			
Female	154	77.0			
Race					
White	159	79.5			
Non-White	41	20.5			
Marital Status					
Married	63	31.5			
Widowed	105	52.5			
Divorced/ Separated	19	9.5			
Never Married	12	6.0			
Level of Education					
Less than High School	43	21.5			
High School	71	35.5			
More than High School	86	43.0			

Table 4 cont.

<u>Background Contextual Description of the Sample (N = 200).</u>

Variable	n	%	Mean	S.D.	Range
Religion					
Protestant	113	56.5			
Catholic	76	38.0			
Jewish	4	2.0			
Evangelist	3	1.5			
Other	4	2.0			

Table 5

Mean Scores and Standard Deviations of Self-rated Chronic Pain (N = 200).

Variable	Mean	S.D.	Range
Pain Intensity			
Worst Pain	3.16	.89	1 - 5
Average Pain	3.00	.85	1 - 5
Least Pain	2.28	1.02	1 - 5
Current Pain	2.00	1.31	0 - 5
Total Pain Index	8.45	2.35	3 - 15
Pain Duration (in months)	140.53	177.03	3 - 1044

Table 6

Frequencies and Percentages of Self-Reported Pain Locations (N = 200).

Variable	n	%
Head	35	18.0
Upper Extremities	83	41.0
Abdomen & Chest	20	10.0
Hip	92	46.0
Back	33	17.0
Lower Extremities	130	65.0

Table 7

Reliability Analyses, Mean Scores, and Standard Deviations of the Self-reported Use of Pain Coping Strategies, by Subscale and Total Score (N = 200).

Pain Coping Strategies (Item #) Variable	Cronbach Alpha	Mean	S.D.	Range
Cognitive Strategies	$\alpha = .71$	13.34	8.50	0 - 41
(14) Distraction		2.39	2.30	0 - 6
(15) Reinterpretation		1.68	2.06	0 - 6
(16) Self-statements		3.76	2.14	0 - 6
(17) Ignoring		2.22	2.21	0 - 6
(18) Catastrophizing		1.64	1.93	0 - 6
(26) Imagery		1.41	2.10	0 - 6
(28) Hypnosis		.25	.96	0 - 6
Behavioral Strategies	$\alpha = .74$	26.13	11.30	0 - 54
(19) Diversion		3.60	2.13	0 - 6
(20) Pain Medication		3.87	2.23	0 - 6
(21) Report Pain		4.25	2.06	0 - 6
(22) Heat		2.93	2.23	0 - 6
(23) Cold		1.42	1.91	0 - 6
(24) Massage		1.93	2.30	0 - 6
(25) Relaxation Techniques		2.28	2.22	0 - 6
(27) Exercise		3.60	2.12	0 - 6
(29) Music		2.27	2.45	0 - 6
Total Pain Coping Score	$\alpha = .81$	39.46	7.35	0 - 90

Table 8

Confirmatory Two-Factor Analysis of the Pain Coping Scale.

Pain Coping Strategies (Item #) Variable	Factor Loadings	
	Cognitive Strategies	Behavioral Strategies
(14) Distraction	.69*	
(15) Reinterpretation	.62*	
(16) Self-statements	.50*	
(17) Ignoring	.49*	
(18) Catastrophyzing	.36*	
(26) Imagery	.60*	
(28) Hypnosis	.38*	
(19) Diversion		.57*
(20) Pain Medication		.35*
(21) Report Pain		.48*
(22) Heat		.49*
(23) Cold		.41*
(24) Massage		.55*
(25) Relaxation Techniques		.50*
(27) Exercise		.60*
(29) Music		.52*

*$p < .05$

Fit Indices: χ^2 = 271.58, df = 103, $p < .00$, GFI = .85, NFI = .65, IFI = .75, CFI = .74, RMSEA = .09, AIC = 337.58

Table 9

Reliability Analyses, Mean Scores, and Standard Deviations of the Self-reported Use of Religious Coping Strategies, by Subscale and Total Score (N = 200).

Religious Coping Strategies (Item #) Variable	Cronbach Alpha	Mean	S.D.	Range
Collaborative Strategies	$\alpha = .96$	18.58	8.68	6 – 30
(31) When I have pain, I talk to God about it and together we decide what it means.		3.03	1.56	1 – 5
(35) Together, God and I put my plans to manage my pain into action.		3.00	1.60	1 – 5
(36) When it comes to deciding how to manage my pain, God and I work together as partners.		3.13	1.58	1 – 5
(40) When considering how to manage my pain, God and I work together to think of possible solutions.		3.14	1.59	1 – 5
(43) When solving a problem with pain, I work with God to make sense of it.		3.09	1.58	1 – 5
(48) When I worry about pain, I work together with God to find a way to relieve my worries.		3.19	1.65	1 – 5
Self-Directive Strategies	$\alpha = .85$	13.17	6.73	6 –30
(33) When I have pain, I deal with my feelings without God's help.		2.19	1.43	1 – 5
(37) I act to manage my pain without God's help.		2.00	1.41	1 – 5
(38) When I have difficulty managing my pain, I decide what it means by myself, without help from God.		2.18	1.50	1 – 5
(42) When thinking about how to manage my pain, I try to come up with possible solutions without God's help.		2.16	1.45	1 – 5

Table 9 cont.

Reliability Analyses, Mean Scores, and Standard Deviations of the Self-reported Use of Religious Coping Strategies, by Subscale and Total Score (N = 200).

Religious Coping Strategies (Item #) Variable	Cronbach Alpha	Mean	S.D.	Range
Self-Directive Strategies cont.				
(44) When deciding on what pain treatments to use, I make a choice without God's help.		2.36	1.56	1 – 5
(47) After I've gone through a rough time trying to manage my pain, I try to make sense of it without relying on God.		2.29	1.51	1 – 5
Deferring Strategies	α = .93	16.77	8.11	6 – 30
(32) Rather than trying to come up with the right solution to manage my pain myself, I let God decide how to deal with it.		2.91	1.56	1 – 5
(34) When pain makes me anxious, I wait for God to take those feelings away.		2.68	1.57	1 – 5
(39) I don't spend much time thinking about the pain I've had; God makes sense of it for me.		2.95	1.52	1 – 5
(41) When I have severe pain, I leave it up to God to decide what it means for me.		2.90	1.61	1 – 5
(45) Before I begin to treat my pain, I wait for God to take control and know somehow He'll work it out.		2.60	1.57	1 – 5
46) I do not have to think about managing my pain because God manages it for me.		2.75	1.61	1 – 5
Religious Coping Strategies	α = .93	58.18	19.04	18 - 90

Table 10

Confirmatory Three-Factor Analysis of the Religious Coping Scale (N = 200).

Religious Coping Strategies (Item #) Variable	Factor Loadings		
	Collaborative Strategies	Self-Directive Strategies	Deferring Strategies
(31) When I have pain, I talk to God about it and together we decide what it means.	.82*		
(35) Together, God and I put my plans to manage my pain into action.	.89*		
(36) When it comes to deciding how to manage my pain, God and I work together as partners.	.92*		
(40) When considering how to manage my pain, God and I work together to think of possible solutions.	.90*		
(43) When solving a problem with pain, I work with God to make sense of it.	.94*		
(48) When I worry about pain, I work together with God to find a way to relieve my worries.	.87*		
(33) When I have pain, I deal with my feelings without God's help.		.59*	
(37) I act to manage my pain without God's help.		.62*	
(38) When I have difficulty managing my pain, I decide what it means by myself, without help from God.		.62*	
(42) When thinking about how to manage my pain, I try to come up with possible solutions without God's help.		.88*	
(44) When deciding on what pain treatments to use, I make a choice without God's help.		.76*	
(47) After I've gone through a rough time trying to manage my pain, I try to make sense of it without relying on God.		.73*	

Table 10 cont.

Confirmatory Three-Factor Analysis of the Religious Coping Scale (N = 200).

Religious Coping Strategies (Item #) Variable	Factor Loadings		
	Collaborative Strategies	Self-Directive Strategies	Deferring Strategies
(32) Rather than trying to come up with the right solution to manage my pain myself, I let God decide how to deal with it.			.76*
(34) When pain makes me anxious, I wait for God to take those feelings away.			.79*
(39) I don't spend much time thinking about the pain I've had; God makes sense of it for me.			.76*
(41) When I have severe pain, I leave it up to God to decide what it means for me.			.91*
(45) Before I begin to treat my pain, I wait for God to take control and know somehow He'll work it out.			.89*
(46) I do not have to think about managing my pain because God manages it for me.			.87*

*p < .05
Fit Indices: χ^2 = 358.37, df = 132, p < .00, GFI = .83, NFI = .89, IFI = .93,
       CFI = .93, RMSEA = .09, AIC = 436.71

Table 11

Reliability Analyses, Mean Scores, and Standard Deviations of the Self-Reported Degrees of Difficulty Performing Everyday Activities (N = 200).

Everyday Activities (Item #) Variable	Cronbach Alpha	Mean	S.D.	Range
Total Mobility Score	α = .81	6.51	2.59	3 – 12
(49) Walking inside your home		1.86	.93	1 – 4
(50) Climbing Stairs		2.55	1.11	1 – 4
(51) Moving in and out of chairs		2.10	1.00	1 – 4
Total Hand Score	α = .68	4.55	1.91	3 – 11
(52) Opening Containers		1.92	1.00	1 – 4
(53) Writing		1.48	.85	1 – 4
(54) Dialing a phone		1.15	.50	1 – 4
Total Personal Care Score	α = .83	5.58	2.42	4 – 16
(55) Washing all body parts		1.42	.77	1 – 4
(56) Putting on pants		1.37	.71	1 – 4
(57) Putting on a shirt		1.37	.70	1 – 4
(58) Buttoning a shirt		1.42	.79	1 – 4
Total Home Chores Score	α = .66	5.28	2.15	3 – 12
(59) Doing Laundry		1.32	.71	1 – 4
(60) Reaching into low cupboards		2.06	1.02	1 – 4

Table 11 cont.

Reliability Analyses, Mean Scores, and Standard Deviations of the Self-Reported Degrees of Difficulty Performing Everyday Activities (N = 200).

Everyday Activities (Item #) Variable	Cronbach Alpha	Mean	S.D.	Range
Total Home Chores cont.				
(62) Vacuuming a rug		1.90	1.02	1 – 4
Total Social Roles Score	$\alpha = .79$	4.37	2.02	3 - 12
(64) Visiting family or friends		1.25	.64	1 – 4
(65) Attending meetings		1.39	.78	1 – 4
(66) Performing jobs		1.73	.96	1 – 4
Total Everyday Activity Score	$\alpha = .90$	26.28	8.64	16 - 61

Table 12

Confirmatory Five-Factor Analysis of the Jette Functional Status Index.

| Everyday Activities | Factor Loadings | | | | |
(Item #) Variable	Mobility Scores	Hand Scores	Personal Care Scores	Home Chores Scores	Social Roles Scores
(49) Walking inside your home	.73*				
(50) Climbing stairs	.79*				
(51) Moving in and out of chairs	.78*				
(52) Opening containers		.60*			
(53) Writing		.86*			
(54) Dialing a phone		.63*			
(55) Washing all body parts			.78*		
(56) Putting on pants			.69*		
(57) Putting on a shirt			.80*		
(58) Buttoning a shirt			.71*		
(59) Doing laundry				.59*	

Table 12 cont.

Confirmatory Five-Factor Analysis of the Jette Functional Status Index.

Everyday Activities	Factor Loadings				
(Item #) Variable	Mobility Scores	Hand Scores	Personal Care Scores	Home Chores Scores	Social Roles Scores
(60) Reaching into low cupboards				.67*	
(62) Vacuuming a rug				.63*	
(64) Visiting family or friends					.73*
(65) Attending meetings					.85*
(66) Performing jobs					.71*

*p < .05

Fit Indices: χ^2 = 255.48, df = 94, p < .00, GFI = .87, NFI = .84, IFI = .89,
        CFI = .89, RMSEA = .09, AIC = 339.48

Table 13

Reliability Analysis, Frequencies, and Percentages of Self-Reported Depressive Feelings (N = 200).

GDS Items (Item #) Variable	Cronbach Alpha	No n (%)	Yes n (%)
Total GDS Score	α = .79		
(67) Are you basically satisfied with your life?		13 (6.6%)	185 (93.4%)
(68) Have you dropped out of many of your activities and interests?		157 (79.3%)	41 (20.7%)
(69) Do you feel that life is empty?		178 (91.8%)	16 (8.2%)
(70) Do you often get bored?		145 (73.6%)	52 (26.4%)
(71) Are you in good spirits most of the time?		27 (13.6%)	171 (86.4%)
(72) Are you afraid that something bad is going to happen to you?		172 (87.3%)	25 (12.7%)
(73) Do you feel happy most of the time?		30 (15.3%)	166 (84.7%)
(74) Do you often feel helpless?		159 (80.3%)	39 (19.7%)
(75) Do you prefer to stay at home, rather than going out and doing new things?		156 (79.6%)	40 (20.4%)
(76) Do you feel that you have more problems with memory than most?		159 (80.7%)	38 (19.3%)
(77) Do you thing that it is wonderful to be alive now?		23 (11.7%)	174 (88.3%)
(78) Do you feel pretty worthless the way you are now?		178 (90.4%)	19 (9.6%)
(79) Do you feel full of energy?		84 (43.1%)	111 (56.9%)
(80) Do you feel that your situation is hopeless?		182 (92.4%)	15 (7.6%)
(81) Do you think that most people are better off than you are?		172 (88.2%)	23 (11.8%)

Table 14

Reliability Analyses, Mean Scores, and Standard Deviations of the JARELSpiritual Well-Being Scale, by Subscales and Total Score (N = 200).

Spiritual Well-Being Statements (Item #) Variable	Cronbach Alpha	Mean	S.D.	Range
Total Faith/Belief Score	α = .87	35.80	7.09	7 – 42
(82) Prayer is an important part of my life.		5.10	1.38	1 – 6
(83) I believe I have spiritual well-being.		5.26	1.10	1 – 6
(84) As I grow older, I find myself more tolerant of others' beliefs.		4.96	1.40	1 – 6
(85) I find meaning and purpose in my life.		5.18	1.21	1 – 6
(86) I feel there is a close relationship between my spiritual beliefs and what I do.		5.08	1.36	1 – 6
(87) I believe in an afterlife.		4.86	1.66	1 – 6
(89) I believe in a Supreme power.		5.38	1.25	1 – 6
Total Self-Responsibility Score	α = .68	16.05	7.02	7 – 39
(88) When I am sick I have less spiritual well-being.		2.70	1.83	1 – 6
(93) God has little meaning in my life.		1.87	1.56	1 – 6
(95) Prayer does not help me in making decisions.		2.45	1.84	1 – 6
(98) I prefer that others make decisions for me.		1.90	1.48	1 – 6
(99) I find it hard to forgive others.		2.48	1.63	1 – 6

Table 14 cont.

Reliability Analyses, Mean Scores, and Standard Deviations of the JARELSpiritual Well-Being Scale, by Subscales, and Total Score. (N = 200).

Spiritual Well-Being Statements (Item #) Variable	Cronbach Alpha	Mean	S.D.	Range
Total Self-Responsibility cont.				
(101) Belief in a Supreme Being has no part in my life.		2.15	1.76	1 – 6
(102) I cannot accept change in my life.		2.52	1.83	1 – 6
Total Life Satisfaction Score	α = .78	35.36	5.82	11 – 42
(90) I am able to give and receive love.		5.45	1.11	1 – 6
(91) I am satisfied with my life.		5.28	1.14	1 – 6
(92) I set goals for myself.		4.7	1.38	1 – 6
(94) I am satisfied with the way I am using my abilities.		4.72	1.42	1 – 6
(96) I am able to appreciate differences in others.		5.18	1.15	1 – 6
(97) I am pretty well put together.		5.08	1.23	1 – 6
(100) I accept my life situations.		4.96	1.37	1 – 6
Total Spiritual Well-Being Score	α = .85	87.21	11.67	34 – 123

Table 15

Confirmatory Three-Factor Analysis of the JAREL Spiritual Well-Being Scale.

Spiritual Well-Being Statements (Item #) Variable	Factor Loadings		
	Faith/Belief Score	Self-Responsibility Score	Life Satisfaction Score
(82) Prayer is an important part of my life.	.79*		
(83) I believe I have spiritual well-being.	.84*		
(84) As I grow older, I find myself more tolerant of others' beliefs.	.50*		
(85) I find meaning and purpose in my life.	.68*		
(86) I feel there is a close relationship between my spiritual beliefs and what I do.	.82*		
(87) I believe in an afterlife.	.65*		
(89) I believe in a Supreme power.	.72*		
(88) When I am sick I have less spiritual well-being.		.37*	
(93) God has little meaning in my life.		.65*	
(95) Prayer does not help me in making decisions.		.62*	
(98) I prefer that others make decisions for me.		.49*	
(99) I find it hard to forgive others.		.47*	
(101) Belief in a Supreme Being has no part in my life.		.44*	
(102) I cannot accept change in my life.		.36*	

Table 15 cont.

Confirmatory Three-Factor Analysis of the JAREL Spiritual Well-Being Scale.

Spiritual Well-Being Statements (Item #) Variable	Factor Loadings		
	Faith/Belief Score	Self-Responsibility Score	Life Satisfaction Score
(90) I am able to give and receive love.			.60*
(91) I am satisfied with my life.			.60*
(92) I set goals for myself.			.39*
(94) I am satisfied with the way I am using my abilities.			.65*
(96) I am able to appreciate differences in others.			.63*
(97) I am pretty well put together.			.66*
(100) I accept my life situations.			.62*

*p < .05

Fit Indices: χ^2 = 507.26, df = 186, p < .00, GFI = .79, NFI = .71, IFI = .79, CFI = .79, RMSEA = .09, AIC = 597.26

Chapter 4: Results

Results

The purpose of this study was to examine the relationships between background contextual factors (e.g., age, gender, and race), intensity of chronic pain (e.g., focal stimuli), the use of religious and non-religious coping, and the three health outcomes of functional ability, depression, and spiritual well-being (e.g., adaptive modes). The specific aim of this study was to test the hypothesized relational statements of a proposed middle-range theory of adaptation to chronic pain (ACP) using structural equation modeling. This section will present the results of each proposed research question and their respective hypotheses.

Bivariate Relationships Between Model Variables

To answer the research questions one through five and test their hypotheses, the bivariate relationships between the proposed model variables were examined (see Table 2 on page 85). Research question one examined the relationship between background contextual factors and chronic pain. No statistically significant relationship was found between background contextual factors of age ($r = -.12$, $p = .09$), gender ($r = .12$, $p = .08$), and race ($r = .01$, $p = .89$) and total pain intensity.

Research question two investigated the relationships between total pain intensity and three health outcomes. A significant and positive relationship was found between total pain intensity and functional ability ($r = .52$, $p = .00$), and between total pain intensity and depression ($r = .28$, $p = .00$). Specifically,

participants with higher pain intensity scores had higher levels of functional disability and depression. The relationship between total pain intensity and spiritual well-being was not statistically significant (r = -.05, p = .45).

Research question three assessed the relationship between religious and non-religious coping. A significant and positive association was found between religious and non-religious coping (r = .35, p = .00). In other words, greater use of religious coping was correlated with greater use of non-religious coping.

Research question four examined the relationship between background contextual factors and the use of religious and non-religious coping. A significant and positive relationship was found between gender and religious coping (r = .18, p = .01), and between race and religious coping (r = .37, p = .00). Women and Non-White participants reported using religious coping to manage pain more often than men and White participants did. A significant and positive correlation was also found between gender and non-religious coping (r =.14, p = .05). Women reported using non-religious coping strategies more often than men did.

Lastly, research question five investigated the relationship between total pain intensity and religious, and non-religious coping. Total pain intensity was significantly and positively related to religious coping (r = .14, p = .04) and non-religious coping (r = .30, p = .00). Specifically, participants with higher pain intensity scores reported a greater use of both religious and non-religious coping strategies to manage pain.

Testing Model Fit

Structural equation modeling (SEM), using Amos graphics 4.0 (Amos, 1995-1999), was used to answer research question six, "Does the use of religious coping and non-religious coping mediate the relationship between chronic pain and functional ability, depression, and spiritual well-being after controlling for background contextual factors?" To initiate the SEM process, a baseline measurement model with all paths set to correlate was run. The fit indices for the baseline model were as follows: χ^2 = 176.10, $\underline{df}$ = 104, $\underline{p}$ < .05, GFI = .91, NFI = .87, IFI = .94, CFI = .94, RMSEA = .06, and AIC = 310.10. Then, the proposed model was run and compared to the measurement model. The fit indices for the proposed model were as follows: χ^2 = 235.40, $\underline{df}$ = 122, $\underline{p}$ < .05, GFI = .88, NFI = .83, IFI = .91, CFI = .91, RMSEA = .07, and AIC = 333.40. A significant χ^2 and df change between the measurement model and the proposed model were found (χ^2 = 59.30, $\underline{df}$ = 18, $\underline{p}$ < .05), indicating that the proposed model could be improved.

Direct and indirect effects of the proposed model. The hypothesized relational paths in the proposed model that were found to be non-significant with the bivariate analyses were also found to be non-significant with SEM (see Figure 4). For example, no statistically significant direct effects were found between the background contextual factors: age (β =.12), gender (β = .13), and race (β = .00) and total pain intensity. The path between gender and non-religious coping (β =.14) was also not statistically significant. It should be noted here that coefficients in SEM are not Pearson correlation coefficients; they are

standardized regression coefficients (e.g., beta weights). Beta weights indicate an expected increase in Y standard deviation units, controlling for all the other predictor variables. Because the standard deviations of standardized variables are all set at 1.0, interpreting the values of beta weights can be directly compared across the predictors. For example, if $\beta_1 = .40$, it can be interpreted to mean that Y is expected to increase by .40 standard deviations given an increase in X_1 of one full standard deviation, controlling for X_2 (Kline, 1998). Other non-significant paths were found between non-religious coping and depression ($\beta = .19$) and non-religious coping and spiritual well-being ($\beta = -.04$). However, significant and positive direct effects were found between gender and religious coping ($\beta = .16$, $p < .05$) and race and religious coping ($\beta = .36$, $p < .05$). Women and Non-White participants reported using religious coping strategies significantly more often than men and White participants did.

In the SEM analyses, after controlling for background contextual variables, a significant negative direct effect was found between total pain intensity and spiritual well-being ($\beta = -.16$, $p < .05$), which was not the case in the bivariate analysis. Higher pain intensity levels were significantly associated with lower spiritual well-being scores. In addition, significant and positive direct effects were found between total pain intensity and functional ability ($\beta = .46$, $p < .05$) and between total pain intensity and depression ($\beta = .27$, $p < .05$), after controlling for background contextual variables. Specifically, participants with higher pain intensity levels were more functionally disabled and depressed. Total pain intensity was also found to be significantly and positively related to both religious

coping (β = .19, p < .05) and non-religious coping (β = .35, p < .05). Participants with greater pain intensity levels reported a greater use of religious and non-religious coping strategies. Simultaneous examination of these relationships indicated that the inclusion of religious and non-religious coping did not decrease or eliminate the relationships between pain and the health outcomes. Thus, the use of religious and non-religious coping, in the present study, did not mediate the relationship between total pain intensity and the three health outcomes.
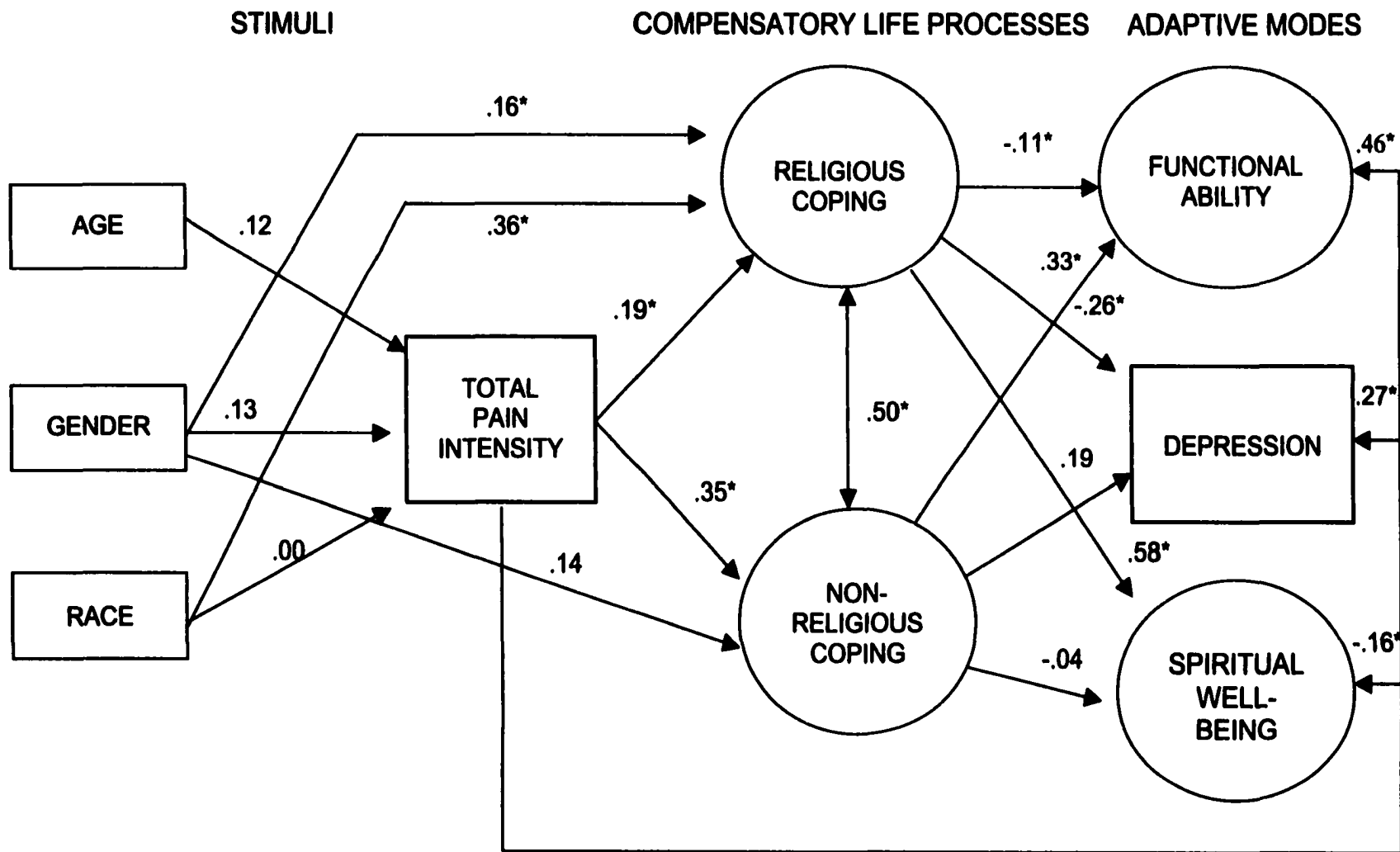
Figure 4. Diagram of the proposed ACP structural model with standardized regression weights.

Note. Estimate between religious and non-religious coping is a correlation coefficient. *P < .05

Respecification: Development of an Alternative Model

Because the SEM approach can be conceptualized as a "model generating" rather than just a model testing technique (Joreskog, 1993), the process of respecification was done to generate an alternative model that fit the data better. The non-significant paths were incrementally deleted from the proposed model until all non-significant paths were eliminated. With each path deletion, new fit indices were calculated for each model and compared to both the baseline measurement model and the previous model to test the χ^2 and df change for statistical significance. Once all of the non-significant paths were deleted, modification indices were examined to identify paths that would significantly decrease the χ^2 statistic if added to the model (see Table 16 for complete outline of the respecification process). For the final model (e.g., model 13), fit indices were as follows $\chi^2 = 202.45$, df = 124, p < .05, GFI = .90, NFI = .85, IFI = .94, CFI = .93, RMSEA = .06, and AIC = 296.45. A non-significant χ^2 and df change between the measurement model and model 13 was found ($\chi^2 = 26.35$, df = 20, p = .05). Thus, model 13 is the alternative model that best fits the data of this study.

_____

Insert Table 16 about here

_____

Direct and Indirect Effects of the Alternative Model.

Direct effects between the background contextual factors and the endogenous variables were found. For example, a significant and negative direct effect was found between age and depression (β = -.18, $\underline{p}$ < .05), and between age and spiritual well-being (β = -.23, $\underline{p}$ < .05). A significant and positive direct effect was found between gender and functional ability (β =.16, $\underline{p}$ < .05) and gender and religious coping (β = .13, $\underline{p}$ < .05). Race was found to have a significant and positive direct effect on religious coping (β = .36, $\underline{p}$ < .05) and a significant negative direct effect on functional ability (β = -.15, $\underline{p}$ = .05). Total pain intensity was found to have a significant and positive direct effect on religious coping (β = .20, $\underline{p}$ < .05), non-religious coping (β = .36, $\underline{p}$ < .05), functional ability (β = .47, $\underline{p}$ < .05), and a significant negative direct effect on spiritual well-being (β = -.14, $\underline{p}$ < .05). Total pain intensity was also found to have a significant positive indirect effect on depression through functional ability (β = .32, $\underline{p}$ < .05). Religious coping was found to have a significant negative direct effect on depression (β = -.18, $\underline{p}$ < .05) and a significant positive direct effect on spiritual well-being (β = .56, $\underline{p}$ < .05). Non-religious coping had a significant positive direct effect on functional ability (β = .22, $\underline{p}$ < .05) (see Figure 5). See table 17 for the factor loadings for each latent construct and the factor intercorrelations (see Table 18) for this respecified model.

Insert Tables 17 & 18 about here

STIMULI   COMPENSATORY LIFE PROCESSES   ADAPTIVE MODES
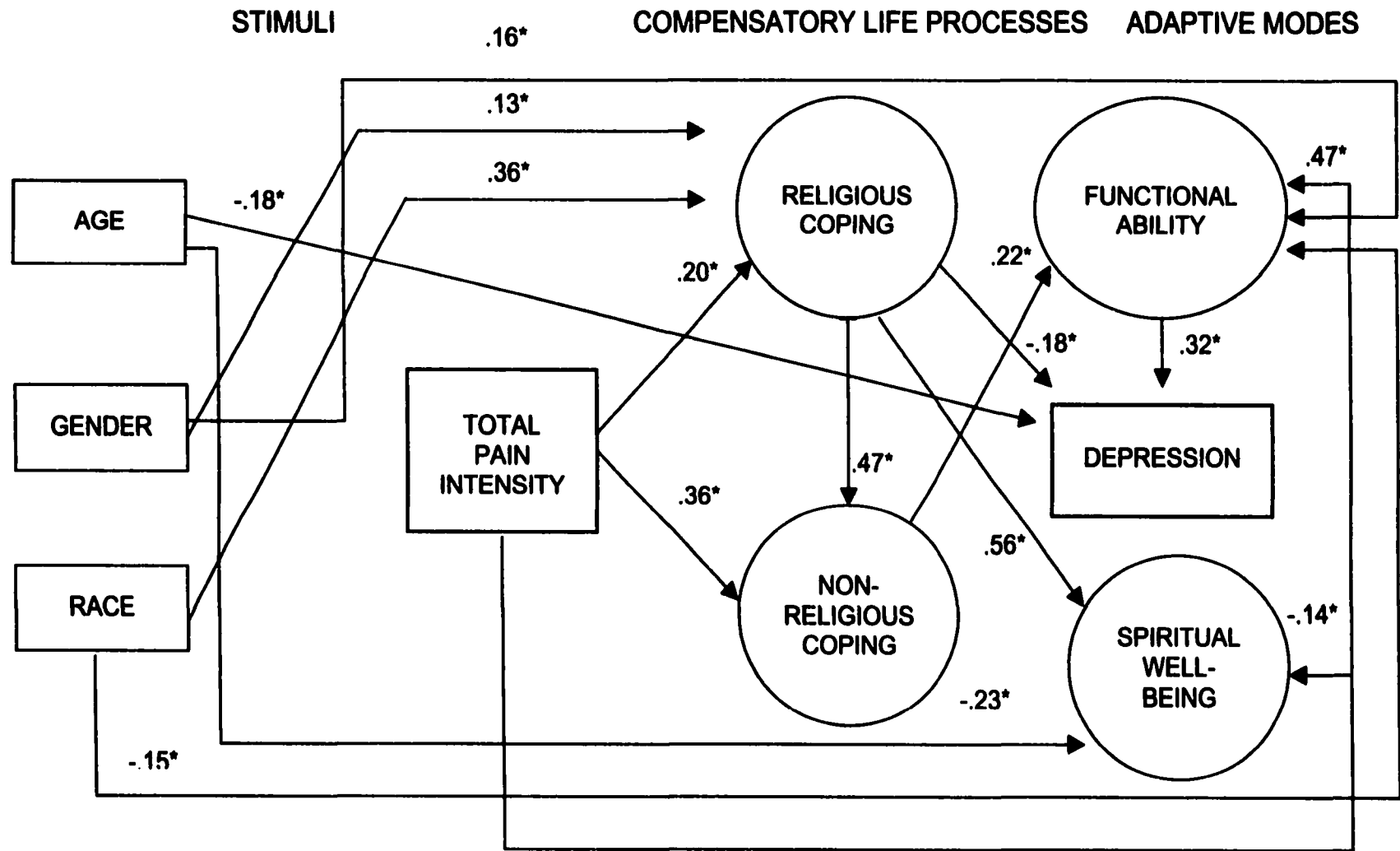

Figure 5. Diagram of the Alternative Model with Standardized Regression Weights.

Note. Estimate between religious and non-religious coping is a correlation coefficient. *P < .05

Table 16

Fit Indices of the Measurement Model, Proposed Model, and Respecified Models.

Models	χ^2	GFI	NFI	IFI	CFI	RMSEA	AIC	χ^2 & df CHANGE COMPARED TO MEASUREMENT MODEL.	χ^2 & df CHANGE COMPARED TO PREVIOUS MODEL.
Measurement Model	176.10 df = 104	.91	.87	.94	.94	.06	310.10		
Proposed Model	235.40 df = 122	.88	.83	.91	.91	.07	333.40	59.30* df = 18	
Model 2 Deleted nrc→spwb	235.55 df = 123	.87	.83	.91	.91	.07	331.58	59.45* df = 19	.15 df = 1
Model 3 Deleted race→pain	235.55 df = 124	.88	.83	.91	.91	.07	329.55	59.45* df = 20	.00 df = 1
Model 4 Deleted age→pain	238.60 df = 125	.88	.82	.91	.91	.07	330.60	62.50* df = 21	3.05 df = 1
Model 5 Deleted gender→pain	241.69 df = 126	.88	.82	.91	.90	.07	331.69	65.59* df = 22	3.09 df = 1
Model 6 Deleted gender→nrc	244.70 df = 127	.88	.82	.90	.90	.07	332.70	68.60* df = 23	3.01 df = 1

* $p < 0.05$; nrc = non-religious coping; rc = religious coping; spwb = spiritual well-being; → = direct path

Table 16 cont.

<u>Fit Indices of the Measurement Model, Proposed Model, and Respecified Models.</u>

Models	$\chi 2$	GFI	NFI	IFI	CFI	RMSEA	AIC	$\chi 2$ & df CHANGE COMPARED TO MEASUREMENT MODEL.	$\chi 2$ & df CHANGE COMPARED TO PREVIOUS MODEL.
Model 7 Deleted rc→function	245.92 df =f 128	.88	.82	.90	.90	.07	331.92	69.82* df = 24	1.22 df = 1
Model 8 Deleted nrc→depression	247.96 df = 129	.87	.82	.90	.90	.07	331.96	71.86* df = 25	2.04 df = 1
Model 9 Added age→spwb	235.38 df = 128	.88	.83	.91	.91	.07	321.38	59.28* df = 24	12.58* df = 1
Model 10 Added race→function	230.67 df = 127	.88	.83	.92	.91	.06	318.67	54.57* df = 23	4.71* df = 1
Model 11 Added age→depression	221.45 df = 126	.89	.84	.92	.92	.06	311.45	45.35* df = 22	9.22* df = 1
Model 12 Added gender→function	215.42 df = 125	.89	.84	.93	.92	.06	317.91	39.32* df = 21	6.03* df = 1
Model 13 Added function→depression	202.45 df = 124	.90	.85	.94	.93	.06	296.45	26.35 df = 20	12.97* df = 1

$\underline{p}$ < 0.05

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Table 17

Factor Loadings of each Latent Construct in the Alternate Respecified Model.

Factors	Latent Construct				Unique Variance
	RC	NRC	FUNC	SPWB	
Collaborative	.96				.92
Self-Directive	.24				.06
Deferring	.91				.82
Cognitive Coping		.61			.38
Behavioral Coping		.86			.74
Mobility			.71		.50
Hand			.59		.34
Personal Care			.70		.50
Home Chores			.85		.72
Social Roles			.70		.50
Faith/Belief				.95	.91
Self-Responsibility				.33	.11
Life Satisfaction				.64	.41

Note. RC = religious coping; NRC = non-religious coping; FUNC = functional ability
        SPWB = spiritual well-being.

Table 18

Factor Intercorrelations of the Alternative Respecified Model.

	1	2	3	4	5	6	7	8	9
[1] Age	1.000 ***								
[2] Gender	-.04	1.000 ***							
[3] Race	-.04	-.07	1.000 ***						
[4] Total Pain	.12	.12	.01	1.000 ***					
[5] RC	.10	.20*	.40*	.22*	1.000 ***				
[6] NRC	.04	.15	.14	.36*	.52*	1.000 ***			
[7] FUNC	.18*	.23*	-.11	.56*	.17*	.39*	1.000 ***		
[8] Depression	.22*	.02	-.16*	.28*	-.08	.10	.39*	1.000 ***	
[9] SPWB	-.20*	.17*	.23*	-.05	.53*	.25*	-.11	.28*	1.000 ***

*p < 0.05 (2-tailed);

Note. RC = religious coping; NRC = non-religious coping; FUNC = functional ability
SPWB = spiritual well-being.

Chapter 5: Discussion

Discussion

The purpose of this cross-sectional, correlational study was to examine the relationships between chronic pain, the use of coping strategies as non-pharmacological interventions, and three health outcomes among Judeo-Christian elders. Specifically, this study examined the relationships between background contextual variables (e.g., age, gender, and race), self-reported pain intensity, the use of religious and non-religious coping as mediating factors, functional ability, depression, and spiritual well-being. The hypothesized relational statements were based on findings of previous empirical research, and a proposed middle-range theory of adaptation to chronic pain (ACP) derived from the Roy Adaptation Model (RAM). The study sample consisted of 200 community-dwelling Judeo-Christian elders from a large, Midwestern city. Structural equation modeling (SEM) was used to test the relationships between concepts of the ACP model. This chapter will present a discussion of the study (1) research findings, (2) conclusions, (3) strengths and limitations, and (4) implications for theory development, nursing practice, and future research.

Research Findings

This section will first discuss the sample characteristics, followed by the study findings as they related to each research question and their respective hypotheses. The process of model testing will then be described. Discussion of the alternative model will be presented last.

Sample characteristics. Two hundred community-dwelling elders from the Detroit Metropolitan Area consented to participate in this study. Most of the participants were recruited from senior community centers where they were actively engaged in social recreation (e.g., card playing, bingo, or arts and crafts). The average age of the participants, in this convenience sample, was approximately 76 years of age. The majority of seniors had a high school or more level of education, were White/Caucasians, female, widowed, and Protestant. These findings are congruent with the age-by-sex-by race distribution of the 1990 US census in the Detroit Metropolitan Area, and the distribution of religious affiliations across the United States (Roof & McKinney, 1987). In addition, mortality rates have declined in the United States causing a rapid population growth of aging adults, 65 years and older. Women, however, have shown the greatest decline in mortality rates and the highest relative gain in life expectancy (Rice, 1997). Thus, the high percentage of women in this study is also consistent with the life expectancy and mortality patterns reported in the United States.

The cognitive status of each participant was assessed using the Animal Naming test, which has been found to be relatively insensitive to the effects of age, education, and gender (Bank, MacNeill, & Lichtenberg, 2000). Most of the elders in this study were able to name 16 animals in one minute. Unverzagt and colleagues (1996) reported a mean score of 14 among a sample of normal, healthy, older African American adults. Thus, participants in this study were considered to be cognitively intact.

All participants in the study had chronic pain (e.g., pain that lasted for more than three months). On average, the study participants reported that their pain was of moderate intensity (e.g., a score of three on a scale of one to five). Lower extremities (e.g., hips, legs, knees, and ankles) were the most frequently reported painful body locations. Most of the seniors reported having pain for about 12 years.

These findings are somewhat inconsistent with previous research. Werner and associates (1998) found that, in a sample of community-dwelling elders, the average pain intensity rating was mild, and the most frequently cited painful body location was the lower back. The Iowa 65 + Rural Health Study found that a large number of rural elders reported leg and lower back pain that significantly interfered with their ability to perform everyday activities (Herr, Mobily, Wallace, & Chung, 1991; Lavsky-Shulan, et al., 1985). Among institutionalized elders, the prevalence of pain has been found to be slightly greater (e.g., 80%) than community-dwelling elders (e.g., 25-50%) (AGS, 1998; Loeb, 1999; Miaskowski, 1999), with the lower back (Ferrell, et al., 1990) and lower extremities being the most frequently reported painful body locations (Ferrell, et al., 1995). In addition, nursing home residents have been found to report more than one source of pain (Ferrell, et al., 1990). Thus, findings from this study support the hypothesis that pain in late life is a significant and prevalent problem, although the exact characteristics differ slightly across sample populations. Participants in this study reported more intense pain than in other studies.

Disparity among pain intensity ratings in the research literature, however, may mask the actual severity and prevalence of pain problems among older adults. According to McCaffery and Ferrell (1994), "Pain is whatever the individual says it is, existing whenever the individual says it does" (p. 56). Seniors have been known to minimize the experience of pain (e.g., rate their pain intensities lower) because of a belief that pain is a normal consequence of aging. Another reason may be a general fear that elders have of losing independence or becoming burdens to others (Miaskowski, 1999: Wells, et.al., 1997). Therefore, relying on self-reported pain intensity ratings may not provide enough information about an elder's health status. Examining the consequences or outcomes of untreated or poorly managed pain (e.g., functional disability and depression), in addition to pain intensity, may provide a more adequate assessment.

Relationships between background contextual variables and chronic pain. Research question one examined the relationship between age, gender, race (e.g., background contextual variables), and total pain intensity (e.g., self-reported summation of the average, worst, and least pain intensities experienced by elders in the last week). No statistically significant relationships were found between age, gender, or race (e.g., White and Non-White) and total pain intensity in both bivariate analyses and structural equation models. This finding is particularly intriguing because it is often assumed that older adults experience more chronic pain due to increased incidence of chronic diseases (e.g., osteoarthritis and rheumatoid arthritis) (Sorkin, Rudy, Hanlon, Turk, & Stieg, 1990). Conversely, older adults are also assumed to experience lower pain

intensities due to age-related changes in sensory pathways (e.g., sensory receptors, peripheral nerves, and the central nervous system) and the reduced production of natural opioids (Gibson, & Helme, 1995; Klinger, & Spaulding, 1998). However, an extensive literature review conducted by Harkins and associates (1984) concluded that the majority of findings that support these assumptions suffered from methodological weaknesses. Most of the studies that found age differences in pain intensity scores included participants that were under the age of 65, introducing young middle-aged chronic pain patients into the sample (Corran et al., 1997; Turk, et al., 1995).

Similarly, most of the reported findings that suggested men and women have different pain threshold and tolerance levels, and, in particular, that women experience more pain, were among very young samples (e.g., high school and undergraduate samples). In addition, these studies were based on experimental modes of noxious stimuli (e.g., thermal, mechanical, and electrical stimuli) to induce pain in healthy participants (Riley et al., 1998b meta-analysis). This present study only included seniors that were 65 years of age and older, generating a pure geriatric sample of participants experiencing chronic pain. Therefore, findings from this study suggest that regardless of age, or whether one is male or female, community-dwelling elders who are 65 years of age and older report similar chronic pain intensities.

The most unexpected finding among the contextual variables was that cultural/racial background had no influence on self-reported pain intensity. Many theoretical models have been proposed that link cultural influences with self-

expressions of pain. For example, Bates (1987) proposed a bio-cultural model of pain perception that integrated principals of the Gate Control theory (Melzack, & Wall, 1965) with Social Learning (Festinger, 1954) and Social Comparison theories (Bandura, 1977). According to this theory, children learn patterns of pain behavior by observing the reactions and behaviors of their parents and others in a specific cultural or ethnic group. Individuals learn how to interpret, express, and respond to pain in similar patterns. An assumption of this model is that there are no basic neurophysiological differences in pain sensation between ethnic groups. However, cultural differences are theoretically presumed to influence (a) the perception and expressions of pain, (b) meanings and attitudes about pain, and (c) the healthcare practices associated with pain (Villarruel & Ortiz de Montellano, 1992).

Findings from prior research suggest that cultural/racial differences influence the perception and expression of pain. For example, Bates and colleagues (1993) reported that Hispanic participants reported significantly higher chronic pain intensities, more interference with work and daily activities from pain, and were more depressed than Americans, French Canadians, and Polish participants. Johnson-Umezulike (1999) found African-American elders reported lower pain intensities than Caucasian elders. Jordan and colleagues (1998), however, found no significant differences in pain intensity ratings between African-American and Caucasian women. Similarly, findings from this study did not support the hypothesis that racial/cultural differences influence the perception of pain. However, it should be noted that this study sample was selected to

represent the community-dwelling elders in the Detroit Metropolitan area. Therefore, uneven distributions of men, women, White, and Non-White participants were interviewed. Thus, caution is warranted with the interpretation of the findings that examined gender and racial differences.

Relationships between chronic pain and health outcomes. The second research question investigated the relationships between the intensity of chronic pain, functional ability, depression, and spiritual well-being. Findings related to each of these relationships will be discussed below.

Functional ability. Bivariate and multivariate analyses revealed strong relationships between total pain intensity and functional disability ($r = .51$, $p = .01$; $\beta = .46$, $p = .05$). Seniors with higher pain intensities reported having more difficulty performing everyday activities than seniors with less intense pain. Participants reported having the most difficulty climbing stairs, moving in and out of chairs, and reaching into low cupboards because of their pain.

Chronic pain typically experienced by elders is often caused by damage to musculoskeletal tissue from chronic diseases, such as arthritis, degenerative joint disease, old fractures, and neuropathies. According to the disablement process described by Nagi (1991), musculoskeletal impairments and pain cause functional limitations by decreasing an individual's strength and mobility, resulting in difficulty performing everyday activities. The majority of elders in this study reported having pain in their lower and upper extremities, and in the hips. Impairments in these body locations would clearly cause an individual to have difficulty climbing stairs, moving in and out chairs, and reaching into low

cupboards. Similar findings have been consistently reported in the research literature (Keefe, et al., 2000; Moss, Lawton, & Glicksman, 1991; Verbrugge, et al., 1991). Thus, findings from this study affirm the results of previous work.

Depression. In this study, a moderate, significant, and positive association was found between depression and chronic pain intensity (r = .28, p = .01; β = .27, p = .05). Seniors with greater pain intensity ratings reported more depressive symptoms than seniors experiencing less pain. This was an expected finding because a large number of researchers have reported that a significant and positive relationship exists between pain and depression (Cohen-Mansfield, & Marx, 1993; Parmalee, et. Al., 1991; Romano & Turner, 1985; Williamson & Schulz, 1992). Several controversial theories that explain this relationship, however, have been identified in the literature. Because functional impairment, loss of control, and lifestyle changes are associated with pain, Rudy and associates (1988) postulated that depression is a common emotional response to pain. Melding (1992) proposed that aging contributes to neuro-endocrine deficiencies (e.g., serotonin and norepinephrine) making the elderly more vulnerable to developing depressive symptoms. Finally, Keefe and colleagues (1986) suggested a mediation model between pain, psychological or biological mechanisms (e.g., anxiety, tension, somatic preoccupation, and biochemical changes), and depression. This study, however, was not designed to specifically test these theories.

Spiritual Well-being. No statistically significant bivariate relationship was found between total pain intensity and spiritual well-being (r = -.05, p = .45).

However, after controlling for background contextual variables in the multivariate analysis, a small, significant, negative relationship (β = -.16, p < .05) was found. In other words, by holding the age, gender, and race of the elder constant, seniors with higher pain intensity ratings reported lower levels of spiritual well-being than seniors with less pain.

According to the National Interfaith Coalition on Aging (1975), spiritual well-being is "the affirmation of life in a relationship with God, self, community, and environment that nurtures and celebrates wholeness." It is saying "yes" to life, even when events or circumstances in an individual's life produce very high levels of stress. In this study, living with more intense chronic pain was associated with lower spiritual well-being among Judeo-Christian elders. Thus, the experience of living with intense chronic pain may undermine seniors' ability to affirm life by serving as a constant reminder of their health and mortality.

Relationship between religious and non-religious coping. The third major research question in this study examined the relationship between the use of religious and non-religious coping. A moderately strong, positive relationship was found between the use of religious and non-religious coping with bivariate and multivariate analyses. According to Lazarus and Folkman (1984), coping is the use of "cognitive and behavioral efforts to manage specific external and internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). In this study, the seniors used both religious (e.g., cognitive efforts) and non-religious coping strategies (e.g., cognitive and behavioral efforts) to manage chronic pain. Based on these conceptual definitions, the large intercorrelation

between religious and non-religious coping was an expected finding, because both have a cognitive component. In addition, these findings suggest that elders use more than one type of coping. For example, elders that use religious coping are likely to use non-religious coping and vice-versa.

Relationship between background contextual variables and coping. Research question four investigated whether gender and race influenced the use of religious and non-religious coping strategies to manage chronic pain. These relationships are summarized in the following sections.

Gender and the use of non-religious coping. A small, statistically significant relationship was found between gender and the use of non-religious coping in the bivariate analyses. Post hoc bivariate analyses were conducted to examine whether mean differences in each coping strategy existed across gender. Significant mean differences were found between men and women for two specific items: the use of diversion (t = -2.71, df = 198, p = .00), and the use of exercise (t = -2.35, df = 198, p = .02). These findings suggest that women reported using diversion and exercise significantly more often than men did.

Other studies have also found differences in the use of pain coping strategies between men and women. Affleck and associates (1999) reported that adult women experiencing arthritic pain used significantly more coping strategies per day than men did to manage pain. Keefe and colleagues (2000) found that women used more catastrophizing (e.g., an individual's tendency to worry about pain and one's ability to cope) than men did. It appears that gender influences the types of non-religious coping strategies used by elders. In this study,

however, these differences disappeared after controlling for other variables in the multivariate model. Thus, this was not a robust finding.

Gender and the use of religious coping. A significant relationship was found between gender and the use of religious coping with the multivariate analyses (β =.16, p < .05). In this study of Judeo-Christian elders, women reported using religious coping strategies to manage pain more often than men did. To determine what types of strategies these women used more often than men, post hoc t-test analyses were computed between gender and each of the three religious coping subscales. Women reported using more collaborative (t = -2.66, df = 198, p = .00) and deferring religious coping strategies (t = -3.12, df = 198, p = .00) than men did. In other words, women either prayed for God to work along with them to manage their pain or they prayed for God to manage their pain for them more often than did men. These findings are consistent with previous research findings that suggest women report using prayer to cope, or seek spiritual comfort, more often than men do when experiencing pain (Affleck et al., 1999; Dunn & Horgas, 2000).

Race and the use of religious coping. A strong relationship was found between race and the use of religious coping in multivariate analyses (β =.16, p < .05). The Non-White subsample, which was predominately African American, reported using religious coping strategies to manage pain more often than did the White subsample. To determine what specific religious coping strategies contributed to the racial differences, post hoc t-tests were computed between race and the three religious coping subscales. These analyses indicated

that Non-White participants reported praying for God to work with them to manage their pain (t = 6.00, df = 198, p = .00), and praying for God to manage their pain (t = 5.25, df = 198, p = .00) more often than White participants. This finding is consistent with prior research. For example, Jordan and colleagues (1998) examined racial differences in pain coping strategies between African-American and Caucasian women and found that African American women reported using praying and hoping significantly more often than Caucasian women did. In a sample of community-dwelling elders, Dunn and Horgas (2000) also found that African-American participants reported using prayer to cope significantly more often than Caucasians.

Pargament (1997) proposed a theoretical explanation of why background contextual factors influence the use of religious coping. He postulated that the elderly, African Americans, women, and widows have less societal access to resources and power. Religion, therefore, becomes an accessible resource that is easily called upon for coping in times of crisis. Women and African Americans report higher levels of personal religiousness and more religious involvement, and, thus, may gain more from the use of religious coping.

Chronic pain and the use of religious and non-religious coping. The fifth research question examined the relationship between the intensity of chronic pain and the use of religious and non-religious coping strategies. Statistically significant relationships were found between total pain intensity, religious (β = .19, p < .05), and non-religious coping (β = .35, p < .05). Participants with higher pain

intensity ratings reported using both religious and non-religious coping strategies significantly more often than participants experiencing less pain.

Among the non-religious coping strategies, participants, on average, reported using behavioral coping strategies ($\underline{M}$ = 26.13, $\underline{SD}$ = 11.30, $\underline{Range}$ = 0 - 90) more often than the cognitive strategies (see Table 9). This finding suggests that the elders used more problem-focused coping strategies (e.g., reporting pain to doctors and nurses, taking pain medication, diversion, and exercise) to manage their pain than emotion-focused strategies (e.g., reinterpretation and catastrophizing).

In addition, elders reported using collaborative religious coping strategies (e.g., working together with God to solve the pain problem) ($\underline{M}$ = 18.58, $\underline{SD}$ = 8.68, $\underline{Range}$ = 18 - 90) more often than self-directive and deferring strategies. These findings do not support previous research that suggested older adults use more passive, emotion-focused coping strategies (Folkman et al., 1987) and less information-seeking strategies (Felton & Revenson, 1987). According to Folkman and associates (1986), people use cognitive and behavioral efforts to manage demands that are appraised as taxing. Appraisal allows people to be selective in what they choose to attend to in their environment and whether they perceive the situation as harmful or threatening. The appraisal process acts as a cognitive mediator between the perceived demands, harms, and threats of the environment and the homeostasis of the individual. If the person perceives the stressor as a challenge or a threat, coping processes are mobilized to eliminate the sources of threat (e.g., problem-focused

coping), and/or to reduce emotional distress (e.g., emotion-focused coping) (Lazarus, 1993). Thus, elders in this study appraised their chronic pain symptoms as amenable to change, and therefore used more problem-focused coping strategies.

Testing the mediation model. The last research question tested the hypothesis that stated, "The relationship between total chronic pain intensity, functional ability, depression, and spiritual well-being will be mediated by the use of religious and non-religious coping, after controlling for background contextual factors (e.g., age, gender, and race)". Structural equation models were conducted to test this model. The results of these analyses did not support this hypothesis. The use of religious and non-religious coping strategies did not decrease or eliminate the statistically significant relationships between total pain intensity, functional ability (β =.46, p < .05), depression β =.27, p < .05), and spiritual well-being (β =-.16, p < .05), after controlling for background contextual variables (Baron & Kenny, 1986). Thus, there was no evidence to support the mediating effect of coping on the relationships between pain and physical or psychological outcomes.

According to Levin and Chatters (1998), findings from this study may support the "suppressor model." The suppressor model postulates that individuals turn to religion and other coping strategies to decrease the negative effects of illness or stress. In this study, higher chronic pain intensity had a negative effect on seniors' physically, psychologically and spiritually. According to Lazarus (1996), coping efforts are mobilized to change situations for the better, and/or to manage

negative emotional responses by transforming the meaning of the harm or threat. In this study, participants that reported higher pain intensity levels used more collaborative, religious coping strategies and more non-religious, behavioral coping strategies to manage pain. These problem-focused strategies are used when people appraise their situation as amenable to change. However, because chronic pain is typically associated with underlying pathological diseases, elders could only anticipate a temporary reduction in pain intensity from these coping efforts. Since coping efforts cannot completely eliminate the pain-producing chronic condition, individuals will continue to experience pain, and pain will continue to negatively effect the elders' health. Theoretically then, one can assume religious and non-religious coping strategies were used by elders in this study to temporarily manage or suppress pain, but these strategies cannot cure the chronic underlying disease. Future research studies, however, would have to test these assumptions in the framework of a suppressor model.

Although coping efforts did not mediate the relationships between pain and the health outcomes, significant relationships were found between the coping efforts and the health outcomes. Participants that reported the greatest use of religious coping (e.g., prayed for God to work with them to manage their pain, or prayed for God to manage their pain) were less functionally disabled (β =-.11, p < .05), less depressed (β =-.26, p < .05), and had higher levels of spiritual well-being (β =.58, p < .05) after controlling for other variables in the model. Seniors that used more non-religious coping strategies (e.g., taking pain medication, exercising, and diversion) were found to be more functionally disabled (β =.58,

$p < .05$). No statistically significant relationship was found between the use of non-religious coping, depression and spiritual well-being.

These findings suggest that the participants used both pharmacological and non-pharmacological interventions to manage their pain. Elders that were more functionally disabled reported using more pain medications, exercise, and activity engagement to divert their attention away from their pain. This finding suggests that the participants may have combined the use of analgesic drugs with other cognitive-behavioral coping strategies to manage their pain. Seniors that were less disabled prayed for God to work with them to manage their pain, or prayed for God to manage their pain (e.g., religious coping) which are more cognitive approaches to pain management. Thus, it appears that the level of functional disability from pain is associated with the types of coping strategies the elders used.

Finally, elders that reported using religious coping strategies more often were less depressed and had greater spiritual well-being than those who used religious coping less often. This finding supports prior research findings that found positive associations between the use of religious coping, illness, and mental health outcomes. For example, Koenig, Pargament, and Nielsen (1998) found higher quality of life scores and fewer depressive symptoms among medically ill hospitalized older adults who used more religious coping activities. In this study, religious coping activities were a) seeking support from clergy or church members, b) praying and offering spiritual help for others, c) working together with God), and d) appraising situations as God's plan. Ayele and

colleagues (1999) reported that elderly, medically ill patients who used religion as a coping resource were significantly more satisfied with life than those patients who did not use religion to cope. Thus, the use of religious coping has been linked with positive mental health outcomes among older adults dealing with chronic conditions in the hospital and in the community. The results of the present study lend further support for this finding.

Testing model fit. In this study, the measurement and structural components of the proposed model were specified and estimated together, using structural equation modeling. The measurement component specified, a priori, how each measurement factor should load on a particular theoretical construct. The structural component identified the hypothesized relational paths among the latent variables. Therefore, the fit of the model represented how well the measures represented the constructs in the model, and the magnitude of the proposed relationships between the constructs. Thus, a model that is found to have a "poor fit" may be the result of poorly developed measures and/or a poorly developed theoretical model (Ratner,et al., 1999). Overall, fit indices of the proposed model suggested "an adequate fit" to the data. The χ^2/df ratio was less than two, IFI and CFI indices were relatively close to .95, and the RMSEA was indicative of a slightly better than average fit (Byrne, 2001: Hair et al., 1998).

To determine why the proposed model did not have a better fit, factor loadings for each theoretical construct were examined (see Table 17). Factor loadings for each latent construct were found to be sufficient, except for the self-directive factors in the religious coping scale and the self-responsibility factors of the

JAREL spiritual well-being scale. Because the self-directive items reflected coping efforts that were not religious in nature, and the self-responsibility items reflected a lack of spiritual well-being, one would expect these factors to not load well with their respective latent constructs. However, the items from these subscales were used to capture those elders who did not use religious coping to manage their pain, and were less spiritually well. Therefore, these items added variability to the scales and were maintained in the analyses. Thus, these low factor loadings could have contributed to why the model did not fit better. In addition, six out of the eighteen hypothesized relationships were found to be non-significant, decreasing the fit of the proposed model's theoretical structure.

Respecification: The alternative model. Although the fit of the proposed model was considered adequate, the fit indices indicated that the model could be improved. Thus, modeling techniques were undertaken to develop an alternative model. After the deletion of seven non-significant paths and the addition of five paths, an alternative model that was not statistically significant from the measurement model was created. These indices, although improved from the proposed model, still indicated "an adequate fit" to the data.

Through the use of SEM respecification process, very interesting and intriguing relationships emerged from the data between the manifest variables. As in the proposed model, (a) background contextual variables did not directly effect total pain intensity, (b) females and Non-Whites used religious coping most often, (c) seniors with higher levels of pain intensity used religious and non-

religious coping strategies more often, (d) the magnitude of the relationship between religious and non-religious coping strategies was significantly large, (e) seniors with higher levels of pain intensity had greater difficulty performing everyday activities, and had lower spiritual well-being (f) seniors that used more frequent religious coping strategies were less depressed and had higher spiritual well-being, and (g) seniors that used non-religious coping strategies more often had greater difficulty performing everyday activities.

Significant direct effects between background contextual factors and health outcomes that were not hypothesized in the proposed model also emerged from the data. The relationships between gender and race on functional ability will be discussed first, followed by the relationships between age, depression, and spiritual well-being. The significant indirect effect of chronic pain intensity on depression through functional disability will be discussed last.

Relationships between gender, race, and functional ability. In this study, women (β =.16, p < .05). and White elders (β =-.15, p < .05) reported having more difficulty performing everyday activities than men and Non-White elders. Because co-morbidity was not assessed in this study, one can only speculate from prior empirical research that, as one ages, the incidence of osteoarthritis (OA) and rheumatoid arthritis (RA) becomes more common in women, and effects more body locations (Altman, 1990; Sinclair, Walston, Dwyer, Blackburn, Fuchs, 1998). To assess whether there were gender and racial differences in the number of reported painful body locations, post hoc t-tests were computed. No statistically significant differences in the number of painful body locations were

found between men and women (t = -1.490, df = 198, p = .138), and between White and Non-White elders (t = -1.236, df = 198, p = .218). Therefore, having more painful body locations did not appear to be the reason why women and White elders reported greater functional disability.

Gender and race did not influence self-reported pain intensity, thus differential pain intensity ratings was also not a significant contributing factor in the functional ability ratings. However, because pain duration was not included in the total pain intensity index, post hoc t-tests were calculated between pain duration, gender, and race to determine if women and Whites were more functionally disabled because they lived with pain for longer periods of time. There were no statistical differences in pain duration between men and women (t = .95, df = 198, p = .34), or between Whites and Non-Whites (t = -.13, df = 198, p = .90). Therefore, pain duration did not account for the relationship between gender, race, and functional ability.

Co-morbid conditions have been found to increase levels of self-reported pain intensity and functional disability in older adults (Farrell, Gerontol, Gibson, & Helme, 1995; Verbrugge et al., 1991). Thus, one can only speculate that, in addition to chronic pain, the women and White participants in this study had other co-morbid conditions that influenced their ability to function, which have been found to increase with age (Sorkin, et al., 1990). Future research should include comprehensive measures of medical conditions in order to examine these hypotheses.

Relationships between age, depression and spiritual well-being. Negative, significant relationships were found between age and depression (β =-.18, $\underline{p}$ < .05), and age and spiritual well-being (β =-.23, $\underline{p}$ < .05). In this study, older seniors reported fewer depressive symptoms, yet had lower levels of spiritual well-being than the younger seniors did. One would intuitively assume from these findings that the longer elders live with chronic pain, the more depressed and less spiritually well they would become. To test this assumption, a post hoc ANOVA was computed between pain duration (e.g., measured in months) and age. There was no statistically significant difference between the age of the elder and pain duration ($\underline{F}$ = .896, $\underline{df}$ = 198, p = .668). Thus, co-morbidity or other age-related stressful life events (e.g., loss of spouse and other loved ones, caregiver stress, and end of life issues) may, once again, have contributed to these relationships.

Most perplexing about these findings is that whatever the unexplained age-related factors were, they decreased spiritual well-being among the older elders, but did not depress them. This finding suggests that although the psychological and spiritual dimensions of human beings are interrelated, they are also distinct and separate domains. Thus, it is essential that health care providers assess the biological, psychological, social, and spiritual health of their patients.

Relationships between chronic pain, functional ability, and depression. The most intriguing relationships in the alternative model were found between chronic pain, functional ability, and depression. In this study, a statistically significant indirect effect was found between total pain intensity, functional ability, and the

number of depressive symptoms reported by the elders. In other words, seniors reported more depressive symptoms if they were more functionally disabled from chronic pain. Williamson and Schulz's (1992) study reported similar findings among community-dwelling older adults. Older adults that had greater difficulty conducting routine daily activities because of pain-related functional impairments were more depressed symptoms than older adults with lower pain-related functional impairments. These findings also support Rudy and associates (1988) theory that depression is a common emotional response to pain because of the influence that pain has on functional ability.

Conclusions

Very interesting relationships were found among the concepts of the proposed model that either validated or were inconsistent with previous research. First, background contextual variables of age, gender, and race were found to have no influence on the level of pain intensity experienced by the elders. On average, the elders reported experiencing moderate levels of pain intensity, with the lower extremities being the most frequently identified painful body location. Second, seniors that reported higher pain intensities were found to have higher levels of functional disability, were more depressed, and had lower levels of spiritual well-being. The relationship between total pain intensity and spiritual well-being represented an original finding and new line of inquiry. Third, because both have a cognitive component, a strong relationship between religious and non-religious coping was found, which also represented an original finding. Fourth, women reported using diversion and exercise more often than men, suggesting that

gender may influence the types of non-religious coping strategies used by elders. Women and African-Americans reported using religious coping strategies more often then men and Whites, which validates prior research findings. Elders with higher pain intensities reported using more collaborative religious coping strategies and non-religious behavioral coping strategies to manage their pain. This fifth finding suggests that these elders appraised their pain as amenable to change and used more problem-focused coping strategies. Sixth, the use of religious coping and non-religious coping strategies did not mediate the relationship between total pain intensity and the three health outcomes. However, elders that reported using religious coping more often were less functionally disabled, less depressed, and had higher levels of spiritual well-being. Elders that used more non-religious coping strategies were more functionally disabled. Thus, participants in this study used both pharmacological and non-pharmacological interventions to manage chronic pain. In addition, these findings suggest that the level of functional impairment had an influence on the types of coping strategies used by elders. The seventh, and final contribution, was the development of an alternative model that suggested higher pain intensity levels had an indirect effect on depression through functional disability.

Limitations

Although this study has many strengths, it was not without methodological limitations. For example, the cross-sectional research design limited the interpretation of the path coefficients to correlates or associations, rather than causal or predictive relationships. With longitudinal research designs, causal or

predictive path coefficients can be estimated with SEM, providing the researcher with a more powerful test. In addition, despite prior research that supports the use of cross-sectional designs when investigating mediation models, the use of longitudinal data is a better design to test these hypotheses. Thus, a longitudinal design would have strengthened the findings of this study.

Another limitation was the use of convenience sampling, which is a non-probability type of sampling technique. The major limitation of this type of sampling technique is that it can produce a less accurate representation of the targeted population (Polit & Hungler, 1999). The majority of elders in this sample were recruited from senior centers where they were actively involved in social recreation. Seniors were also recruited from senior apartment buildings to capture elders that may have been home bound. However, the distribution of active elders was greater than homebound elders, which may not be an accurate representation of the community-dwelling older adults coping with chronic pain. The inclusion of only Judeo-Christian elders into the study also limited the findings to this portion of the population. In addition, the uneven distributions between men and women, and between Whites and Non-Whites, while representative of the racial and gender distributions of the Detroit Metropolitan area, limited the statistical power to detect differences.

One final limitation was the use of SEM as a statistical technique. Because SEM is a model generating technique, the respecification process is flexible and not bound by firm statistical rules. One controversial issue surrounding the use of SEM is that a researcher can misuse SEM to fit the data to a model that was

statistically created, rather than from an a priori proposed model based on substantive theory and empirical research. In addition, numerous alternative models, with adequate fit, can be generated from one set of data, decreasing confidence in research findings (Kline, 1998). This study did test an a priori model. The alternative model, however, was generated statistically, based on substantive theory and empirical findings.

Implications

According to Meleis (1997), scholarship in nursing is evident when there is a synthesis of knowledge, theory, research, philosophy, and practice. Thus, a specific aim of this study was to enhance nursing theory, research, and practice by integrating the findings from this study into the existing theoretical and empirical knowledge. Therefore, this section will present the study implications for nursing theory, research, and practice.

Implications for nursing theory. This study was based on a middle-range theory of adaptation to chronic pain (ACP) that was developed from the theoretical framework and concepts of a nursing extant grand theory, the Roy Adaptation Model (RAM) (Roy & Andrews, 1999). The ACP model tested the relationships between background contextual variables (e.g., age, gender, and race), the focal stimulus (e.g., total chronic pain intensity), compensatory life processes (e.g., the use of religious and non-religious coping strategies), and adaptive responses (e.g., functional ability, depression, and spiritual well-being) among community-dwelling Judeo-Christian elders. The RAM's theoretical framework provided an adequate fit to the data and supported the majority of the

hypothesized relationships and findings from prior research. In addition, the assumptions that were developed for the ACP model from the RAM were also supported. This section will first discuss the ACP model assumptions, followed by ACP model findings as they relate to RAM.

ACP model assumptions. The five ACP model assumptions, synthesized from Roy's scientific and philosophical assumptions (Roy, 1997), were supported in the study findings. The focal stimulus (e.g., total pain intensity) was found to provoke greater uses of religious and non-religious coping responses among the Judeo-Christian elders. Elders purposefully used these coping efforts to manage chronic pain. The majority of elders reported that they prayed for God to work with them to manage their pain or for God to manage their pain for them. Finally, elders that reported using higher levels of religious coping were less functionally disabled, less depressed, and had higher levels of spiritual well-being. Elders that used more non-religious coping strategies to help them deal with their pain were more physically disabled. Therefore, adaptation to chronic pain is the process and outcome of Judeo-Christian elders who choose religious and non-religious coping strategies to create human and environmental integration that promotes survival, growth, and integrity. Thus, the underlying assumptions adopted from Roy's model were congruent with the findings of this study.

ACP model findings as they relate to RAM. According to Roy and Andrews (1999), humans are holistic adaptive systems in constant interaction with external stimuli. Roy classified the three types of stimuli that interact with human systems as focal (e.g., stimuli immediately affecting the system), contextual (e.g., all other

conscious stimuli that contribute to the effect of the focal stimuli), and residual (e.g., unknown factors affecting the system). In the ACP model, the focal stimulus was the total self-reported chronic pain intensity experienced by the elders in the last week. Age, gender, and race were conceptualized as background contextual variables because prior research findings suggested that these factors had an influence on self-reported intensity of chronic pain. The RAM provided the theoretical framework for establishing the directional, hypothesized relational paths between the background contextual variables and the focal stimulus. However, in this study, age, gender, and race did not influence the level of total pain intensity reported by the elders. Thus, whether relationships were or were not found between concepts, important empirical information concerning the chronic pain experiences of elders was gained, contributing to existing knowledge.

Conceptualizing total pain intensity as the focal stimulus, rather than an adaptive outcome, represented a new line of inquiry that is consistent with the theoretical framework of the RAM. Elders with higher total pain intensities reported using more religious and non-religious coping strategies to manage chronic pain. These coping efforts, however, provide only temporary pain relief, due to the chronic nature of underlying pathological diseases. Elders continued to experience chronic pain, and pain continued to have an effect on the elders' physically, psychologically, and spiritually. Consistent with the RAM, one could postulate that the health outcomes, whether adaptive or ineffective, were also acting as feedback mechanisms in the elders, affecting both the pain stimulus

and the use of coping efforts. These feedback mechanisms are a central process in the RAM, and supports Roy's conceptualization of humans as holistic adaptive systems in constant interaction with stimuli (Roy & Andrews, 1999). This cross-sectional study measured the influence of pain and coping on three health outcomes in the past week. Participants with higher pain intensities reported that they used more religious and non-religious coping strategies in the past week than participants with lesser pain. However, because the daily effects of the coping strategies were not measured directly after they were used, the temporal relationships between the use of coping strategies and their effects were also not measured. Therefore, the cross-sectional design used in this study may not have captured the true effectiveness of the coping strategies used by the elders, or the influence of the behavioral adaptive or ineffective outcomes acting as feedback mechanisms into the system. Thus, a longitudinal study that measures the daily effects of coping, and incorporates feedback mechanisms (e.g., behavioral responses) as additional paths, may be the best design to test this model in future studies based on the RAM as a theoretical framework.

Although the cross-sectional design was not the best method to test this model, the use of structural equation modeling (SEM) allowed this researcher to examine all the relationships between the focal stimulus, coping processes, and the adaptive outcomes simultaneously. These analyses provided more in-depth empirical explanations of the cognator processes used among Judeo-Christian elders experiencing chronic pain. According to Roy and Andrews (1999), coping processes in the cognator subsystem involve perceptual and information

processing, learning, judgement, and emotion. However, these abstract cognator processes are not clearly defined and explained. In this study, the participants identified that they used more problem-focused religious and non-religious coping strategies to manage their pain. The greater use of these problem-focused strategies suggests that the elders appraised their pain as amenable to change. However, because chronic pain is typically a symptom of tissue damage caused by chronic disease, only temporary changes in pain were expected. Thus, cognator coping processes among elders experiencing chronic pain are continuously activated and challenged to integrate life processes.

In summary, the theoretical framework and major concepts from the RAM were used to create the ACP. The ACP model was then tested using structural equation modeling (SEM), and after model respecification procedures, was found to have an adequate fit to the data. The majority of the ACP hypothesized relational paths, based on the RAM, supported existing substantive theories and empirical research. Thus, the RAM framework provided the basis for a parsimonious and testable middle-range theory, the ACP.

Implications for nursing research. Model testing is a hallmark of nursing research, and although there are controversial issues with SEM, this technique does provide researchers with a powerful mechanism for testing and modifying theories. Structural equation modeling allows the relationships between multiple variables to be tested simultaneously, incorporates measurement error in the variables, and permits numerous indicators of theoretical constructs (Ratner, et al., 1998).

Another advantage to using SEM is that it has a technique for testing models with feedback loops (e.g., non-recursive models). This study tested a recursive model that had all unidirectional relational paths. However, findings from this study suggested that, because chronic pain is a persistent problem, altering the model to include feedback loops between pain, functional ability, depression, and spiritual well-being may create a better fitting model. Adding feedback loops would also be more representative of the RAM's theoretical framework. Thus, SEM can be used to analyze more complex models.

In addition, SEM is a model generating technique, and through the respecification process, new relationships between concepts emerge from the data. Interpretations of these findings are then drawn from theories and previous research, new hypotheses are created, and future research studies are formulated. Thus, SEM is a very powerful statistical technique that can be used to test and/or generate nursing theoretical models.

Recommendations for future research. The development of the ACP model is in its infancy. Further testing of other age-related background contextual factors (e.g., co-morbidity and major life events) that have been found to influence the intensity of pain, and to negatively influence the health of older adults, is warranted. Because the management of chronic symptoms typically have temporary effects, future studies that test for mediation between any chronic condition, coping efforts, and health outcomes need to measure the efficacy of coping efforts in addition to the use of coping strategies. It is also recommended that the researcher use a longitudinal design to investigate the relationships

between chronic pain intensity, use of daily coping efforts, the efficacy of the coping efforts, and health-related behavioral outcomes. Previous research has shown that the use of daily pain coping diaries, as measurement tools, is a possible research strategy for investigating these relationships (Affleck, et al., 1992; Affleck, et al., 1999; Stone & Neale, 1984). Thus, future research should be conducted that tests these relationships in a longitudinal design that uses a pain coping diary as the measurement tool.

Implications for nursing practice. Despite the many theoretical and reported scientific differences in age, gender, and race, chronic pain was found to be a significant problem for all community-dwelling older adults in this study. Findings from this study support the conceptualization that chronic pain is a multidimensional stressor that negatively effects individuals physically, psychologically, and spiritually. On average, elders in this study reported having to cope with moderate levels of pain, which affected their abilities to perform everyday activities, increased depressive symptoms, and decreased spiritual well-being. Increasing nursing awareness and knowledge of the high prevalence of chronic pain in late life, in addition to the negative impact pain has on health, is the first step in recognizing that pain is not a natural consequence of aging. Pain should be treated, and not simply tolerated.

Because chronic pain is multidimensional, nurses need to assess older adults holistically, and not just rely on elders' self-report of pain. Older adults have been known to under-report pain symptoms because of a belief that pain is a consequence of aging. Thus, assessment of the consequences of pain, in

addition to the self-report of pain, may provide nurses with a more accurate assessment of the chronic pain experiences of their elderly patients.

In addition to assessment strategies, findings from this study support the use of pharmacological and non-pharmacological interventions to manage chronic pain. Elders that had the most difficulty performing everyday activities reported using more behavioral coping strategies to manage their pain. Taking pain medications, reporting pain to doctors and nurses, diversion, and exercise were the non-religious coping strategies the elders used most often. These findings suggest that 1) elders were focused on solving their pain problem so that they could perform everyday activities with less difficulty, 2) elders appraised their chronic pain as treatable, 3) elders sought professional help from health care providers to help manage their pain, and 4) combining the use of pain medications and cognitive coping strategies may provide better pain relief. Prior research has suggested that older adults used more passive coping strategies and less information-seeking efforts than younger adults. This study, however, found elders used more active, problem-focused strategies. Thus, elders appear to be open to pain management options in an effort to feel better. Therefore, nurses that care for geriatric patients need to maintain current knowledge of treatment strategies for pain management in late life.

Chronic pain was also found to indirectly increase depression among elders through functional disability. Elders that were unable to perform everyday activities, and remained at home because of pain, were found to be more depressed. Thus, nursing interventions should focus on pain management

strategies that help to keep elders active and able to function. These interventions promote both physical and mental health in the elderly.

Women also reported using exercise and diversion more often than men did, even though there was no gender differences in pain duration, intensity, and locations. It is well known that staying active and exercising has health benefits for people across the life-span. But for seniors experiencing chronic pain, especially arthritic pain, every movement could mean increased pain. Therefore, the use of analgesics may provide an elder with enough pain relief to move and exercise painful areas of the body. In addition, special attention is warranted for men to be encouraged to remain active and exercise more often.

Findings from this study also found support for the growing body of evidence that suggest an association exists between the use of religious coping and positive mental health outcomes. Judeo-Christian elders in this study, particularly women and Non-Whites, that used religious coping more often were found to be less depressed and had higher levels of spiritual well-being than elders that used religious coping less often. The spiritual health of individuals is equally as important to human systems as biological, psychological, and social health. However, not much is known about the factors that influence spiritual health among older adults. Praying to God for help in managing pain was found to be significantly associated with higher levels of spiritual well-being. Having a strong faith and belief in a God that is willing to help are essential attributes that need to be assessed to determine whether patients will benefit from the use of religious coping. Nurses should feel more comfortable in assessing prayer as a coping

and treatment strategy, and should encourage elders to continue using religious coping to promote spiritual well-being and mental health. Nurses do not have to feel they are intruding into the private religious lives of their elderly patients or that they need to share the patient's religious beliefs. Nurses do have to acknowledge the importance of religious beliefs and the use of prayer as coping strategies in the lives of older adults dealing with chronic pain (Dunn & Horgas, 2000).

In summary, testing the proposed ACP model found very interesting and intriguing relationships between chronic pain, the use of religious and non-religious coping, and three health outcomes. In addition, these research findings had implications for nursing theory development, practice, and future research.

APPENDIX A

APPROVAL LETTER FROM RESEARCH SITE

Project Title: Pain and Coping in Elders (PACE)

Principle Investigator: Karen S. Dunn
Doctoral Student, College of Nursing
Research Assistant, Institute of Gerontology
Wayne State University

This letter, signed by an appropriate official, authorizes the use of this site for the purposes of this research study. The purpose of the PACE study is to investigate the prevalence of pain, how it affects the lives of older adults, and how elders manage and cope with pain.

By signing this approval letter, the site grants permission for Karen S. Dunn to:
1). pass out flyers to potential participants,
2). meet with potential participants and give informational talks about the specific aims and ethical considerations of the study.
3). distribute and collect questionnaires.

This letter of approval grants no other obligations or approval, expressed or

implied. In signing, the site indicates that this doctoral student/research assistant

is welcome to use the facility and welcomes the opportunity to participate in this

research.

Facility Name:_____

Address:_____

Name/Title of Authorizing Official:_____

_____Date:_____
      Signature of Authorizing Official

APPENDIX B

Attention Seniors,

The College of Nursing (CON) and the Institute of Gerontology (IOG) of Wayne State University would like to welcome you to the Pain and Adaptive Coping in Elders (**PACE**) research study. This study is being conducted in various adult community centers around the metropolitan Detroit area. The purpose of this study is to identify how older adults cope with chronic pain. If you are **65 years of age or older** and have had **pain for at least 3 months** you are eligible to participate in this very important study.

To answer this very important question, a researcher and her assistants from CON/IOG will be here to give a talk about the study and to distribute a research questionnaire on _____, in the _____. **All information and your identity will be kept confidential.** In addition, you will receive a small reimbursement for your time.

APPENDIX C

ID#_____

Pain and Adaptive Coing in Elders (PACE)

Principal Investigator- Karen S. Dunn, RN, MSN. Wayne State UniversityInstitute of Gerontology and College of Nursing

Information Sheet

A   Introduction and Purpose:

You are being asked to be in a study about health and pain in older adults. We would like to know if you have pain, how it effects you, and what you do to ease and cope with pain. We are asking older adults in an around the Detroit area to complete this survey.

B   Procedure:

You will be asked to fill out a research questionnaire. It will take about 30 minutes to 45 minutes to complete this survey.

C   Benefits:

There are no direct benefits to being in this study. However, you may benefit from telling us about your health and what you do for any pain you have. The results of this study may benefit older adults by helping doctors and nurses to learn about pain, how it effects elders, and what elders do to relieve and cope with pain.

D   Risks:

There are no anticipated risks to being in this study. There are no physical risks to you by being in this study. There is a slight emotional risk due to being asked about your health and pain. Thinking about these things may bring out feelings you have (e.g., feeling sad, depressed, or anxious). You are free to stop filling out the forms at any time. You may call and talk to me, Karen Dunn, RN, MSN at

(313-577-2297) about your feelings if you wish. In addition, you may call the Information and Referral Line at Harper Hospital (313-745-8974) for information about depression and health conditions. There are no social risks to this study. No one will be able to find out what you have told us about your health or pain. All information will be seen only by this nurse conducting this study.

E   Voluntary Participation/Withdrawal:

Taking part in this study is voluntary. You may choose not to take part in this study, or if you decide to take part, you can later change your mind and withdraw from the study. You will not be penalized for not participating in anyway. In addition, you do not have to answer any questions that you do not want to.

F   Costs:

There is no cost to being in this study.

G   Compensation:

In the unlikely event that you become injured as a result of taking part in this study, treatment will be offered to you, or you will be given information about where to receive medical care; but your insurance company will be responsible for the costs. No reimbursement, compensation or free medical care is offered by Wayne State University. You will receive a $5.00 gift certificate to Rite Aid or CVS pharmacies for completing the questionnaire.

I   Confidentiality:

All information collected about you during the course of this study will be kept confidential to the extent permitted by law. You will be identified in the research records by a code number. Information, which identifies you personally, will not be released without your written permission, however, your records may be reviewed by the study sponsor, its agents, the Wayne State University Human Investigation Committee, and appropriate federal agencies. Information from this study may be published, but your identity will be kept confidential in any publications.

J   Questions:

This study will be explained to you and all of your questions will be answered. If you have any questions in the future or in the case of a research related injury or illness, you may contact Karen Dunn at (313) 577-2297. If you have any questions about your rights as a research subject, you can call Dr. Peter A. Lichtenberg, the Chair of the Human Investigation Committee, at (313) 577-1628.

K   Consent to Participate in a Research Study

By completing and returning the survey, it will indicate to us that you have read the information above, your questions have been answered, and you have agreed to be in this study.

APPENDIX D

Pain and Coping in Elders (PACE)
Research Study Questionnaire
Section 1: Background Contextual Information

Please mark one answer with an "X".

1. *Are you male or female?*

	(1) Male
	(2) Female

2. What is your marital status?

	(1) Married
	(2) Living as married
	(3) Separated
	(4) Divorced
	(5) Widowed
	(6) Single, never been married

3. What is the highest grade of school or level of education that you completed?

	(1) Less than 7th grade
	(2) Junior high school (9th grade)
	(3) Partial high school (10th or 11th grade)
	(4) High school graduate
	(5) Partial college (at least one year)
	(6) College or university graduate
	(7) Graduate professional training (graduate degree)

4. **What race or ethnic group do you consider yourself?**

	(1) **White/Caucasian**
	(2) **Black/African American**
	(3) **Asian**
	(4) **Native Hawaiian/Pacific Islander**
	(5) **American Indian/Alaskan Native**
	(6) **Hispanic**
	(7) **Arabic**
	(8) **Other WRITE IN:**_____

Please write in your answer.

5 What is your date of birth?

___ ___ / ___ ___ / ___ ___ ___ ___
  month   day   year

(For example, the month of May is recorded as 05- the fifth month of the year.)

6.   What is your religion?_____

Section 2: Pain Questions

Now we want to learn more about the **pain** you experience.
Please **check only one box** next to the answer that **best describes your pain.**

7.   Did you have pain **in the last week?**

	(0) **No**
	(1) **Yes**

8.   **Where you have the most severe pain,** please **write in how long** you've had this pain

I have had pain for

_____.

(e.g., months or years).

9.   **Most of the time** your pain **in the last week** was.....

	(5) **Worst pain I can imagine**
	(4) **Severe pain**
	(3) **Moderate pain**
	(2) **Mild pain**
	(1) **Slight pain**

10. Your worst pain in the last week was .....

	(5) **Worst pain I can imagine**
	(4) **Severe pain**
	(3) **Moderate pain**
	(2) **Mild pain**
	(1) **Slight pain**

11. Your least pain in the last week was.....

	(5) **Worst pain I can imagine**
	(4) **Severe pain**
	(3) **Moderate pain**
	(2) **Mild pain**
	(1) **Slight pain**

12. Your pain right now is.....

	(5) **Worst pain I can imagine**
	(4) **Severe pain**
	(3) **Moderate pain**
	(2) **Mild pain**
	(1) **Slight pain**

13. Please place an "X" where you have <u>pain</u> on this picture of the body and then draw a

circle around the "X" where you have <u>the most severe pain.</u>
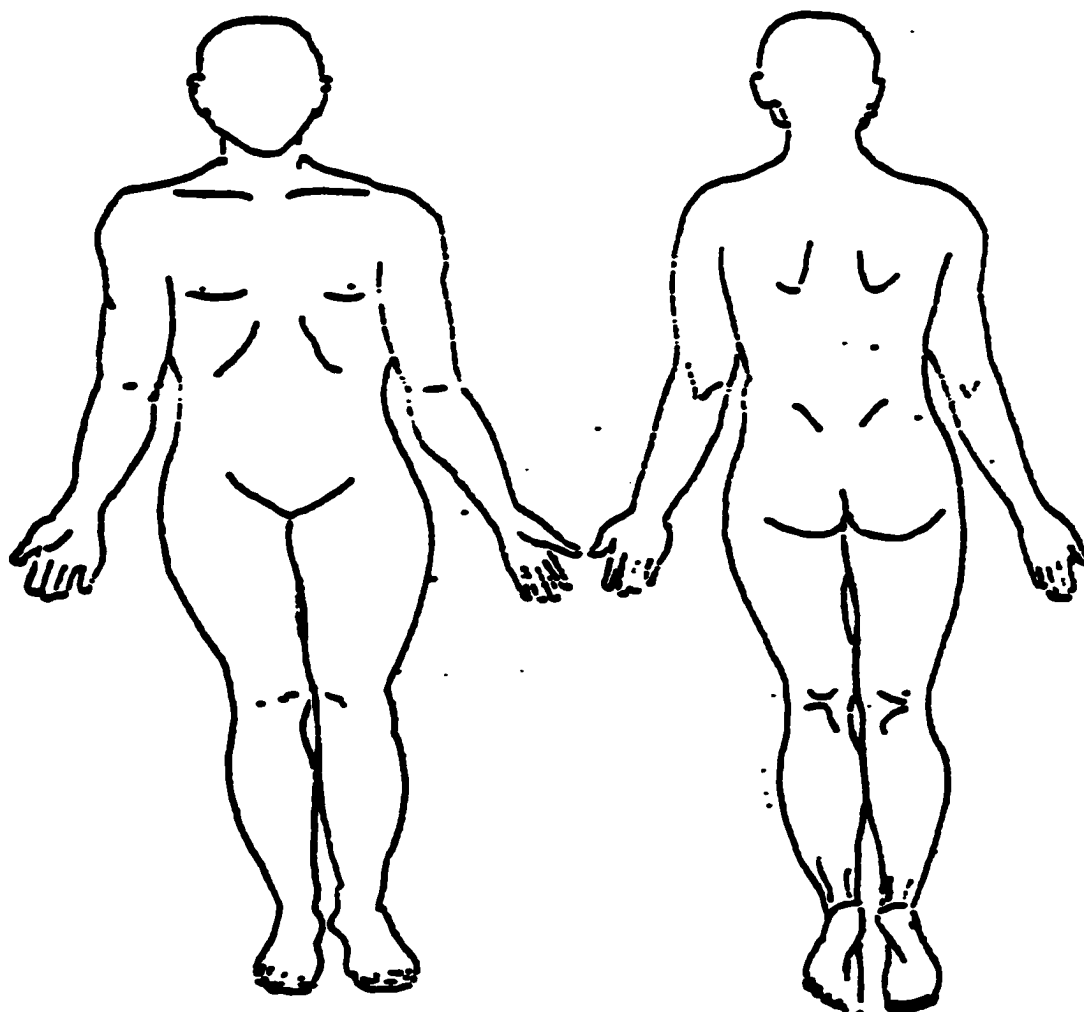
Section 3: Pain Coping Strategies

People who have pain develop many **ways to cope**, or **deal with** it. Below is a list of things that people do when they feel pain. For each item, **please circle one number** on the rating scale to show **how often you have used** that activity when you felt pain **during the past week.**

0 = **Never do it**
3 = **Sometimes do it**
6 = **Always do it**

Pain Coping Strategies		How often have you used this activity when you felt pain in the last week?
		Never do it · · · **Sometimes do it** · · · **Always do it**
▓▓▓▓	▓▓▓▓	▓▓▓▓
15.	I imagine something that is inconsistent with the experience of pain (e.g., I think of my pain as some other sensation, such as numbness).	0 1 2 3 4 5 6
▓▓▓▓	▓▓▓▓	▓▓▓▓
17.	I tell myself that my pain doesn't hurt or affect me in any way.	0 1 2 3 4 5 6

	Pain Coping Strategies	How often have you used this activity when you felt pain in the last week?		
		Never do it	Sometimes do it	Always do it
19.	I engage in active behaviors which divert my attention away from the pain, such as watching TV.	0 1 2 3 4 5 6		
21.	I tell my doctors or nurses about my pain.	0 1 2 3 4 5 6		
23.	I apply cold, such as ice packs, ice wraps, or ice massage to try to decrease my pain.	0 1 2 3 4 5 6		
25.	I use relaxation techniques, such as deep breathing, or meditation.	0 1 2 3 4 5 6		

	Pain Coping Strategies	How often have you used this activity when you felt pain in the last week? Never do it / Sometimes do it / Always do it		
27.	I do mild exercises or range-of-motion exercises to ease my pain.	0 1 2 3	4 5	6
29.	I listen to music to try to decrease my pain.	0 1 2 3	4 5	6

Religious Coping Strategies

Below is a list of **religious activities** people have used when they feel pain. For each item, **please circle one number** on the rating scale to show **how often you have used** that activity when you felt pain **during the past week.**

1 =	**Never used**
2 =	**Rarely used**
3 =	**Sometimes used**
4 =	**Often used**
5 =	**Always used**

	Religious Coping Strategies	How often have you used this religious activity when you felt pain in the last week?				
		Never Used	Rarely Used	Sometimes Used	Often Used	Always Used
32.	Rather than trying to come up with the right solution to manage pain myself, I let God decide how to deal with it.	1	2	3	4	5
34	When pain makes me anxious, I wait for God to take those feelings away.	1	2	3	4	5
36.	When it comes to deciding how to manage my pain, God and I work together as partners.	1	2	3	4	5

	Religious Coping Strategies	**How often have you used this religious activity when you felt pain in the last week?** **Never Used**	**Rarely Used**	**Sometimes Used**	**Often Used**	**Always Used**
38.	When I have difficulty managing my pain, I decide what it means by myself without help from God.	1	2	3	4	5
40.	When considering how to manage my pain, God and I work together to think of possible solutions.	1	2	3	4	5
42.	When thinking about how to manage my pain, I try to come up with possible solutions without God's help.	1	2	3	4	5
44.	When deciding on what pain treatments to use, I make a choice without God's help.	1	2	3	4	5
46.	I do not have to think about managing my pain because God manages it for me.	1	2	3	4	5
48.	When I worry about my pain, I work together with God to find a way to relieve my worries.	1	2	3	4	5

Section 4: Everyday Functional Activities

Please answer the following questions about your everyday activities. We would like to know how **difficult** it was for you to do each of these activities, on the average, **during the past week.** By difficult, we mean **how hard it was** or **how much physical effort** it took to do the activity **because of your pain.** Please circle one number.

1 = No difficulty
2 = Mild difficulty
3 = Moderate difficulty
4 = Severe difficulty

	During the past week, how much difficulty did you have...	No difficulty	Mild difficulty	Moderate difficulty	Severe difficulty
50.	Climbing stairs	1	2	3	4
52.	Opening containers	1	2	3	4
54.	Dialing a phone	1	2	3	4
56.	Putting on pants	1	2	3	4
58.	Buttoning a shirt	1	2	3	4
60.	Reaching into low cupboards	1	2	3	4

	During the past week, how much difficulty did you have...	No difficulty	Mild difficulty	Moderate difficulty	Severe difficulty
62.	Vacuuming a rug	1	2	3	4
64.	Visiting family or friends	1	2	3	4
66.	Performing jobs	1	2	3	4

Section 5: Feelings/Geriatric Depression Scale

Please choose the best answer for how you have felt **over the past week.** Please **circle one** number.

		NO	YES
68.	Have you dropped out of many of your activities and interests?	0	1
70.	Do you often get bored?	0	1
72.	Are you afraid that something bad is going to happen to you?	0	1
74.	Do you often feel helpless?	0	1
76.	Do you feel that you have more problems with memory than most?	0	1
78.	Do you feel pretty worthless the way you are now?	0	1
80.	Do you feel that your situation is hopeless?	0	1

Section 6: JAREL Spiritual Well-being Scale

Please circle the choice that **best** describes how much you agree with each statement in the **last week**. Circle only **one** answer for each statement. There is no right or wrong answer. *The meaning of the answers is as follows:*

1 = Strongly Disagree (SD)
2 = Moderately Disagree (MD)
3 = Disagree (D)
4 = Agree (A)
5 = Moderately Agree (MA)
6 = Strongly Agree (SA)

		SD	MD	D	A	MA	SA
83.	I believe I have spiritual well-being.	1	2	3	4	5	6
85.	I find meaning and purpose in my life.	1	2	3	4	5	6
87.	I believe in an afterlife.	1	2	3	4	5	6
89.	I believe in a Supreme power.	1	2	3	4	5	6
91.	I am satisfied with my life.	1	2	3	4	5	6

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1	=	Strongly Disagree (SD)
2	=	Moderately Disagree (MD)
3	=	Disagree (D)
4	=	Agree (A)
5	=	Moderately Agree (MA)
6	=	Strongly Agree (SA)

		SD	MD	D	A	MA	SA
93.	God has little meaning in my life.	1	2	3	4	5	6
95.	Prayer does not help me in making decisions.	1	2	3	4	5	6
97.	I am pretty well put together.	1	2	3	4	5	6
99.	I find it hard to forgive others.	1	2	3	4	5	6
101.	Belief in a Supreme Being has no part in my life.	1	2	3	4	5	6

Dear Seniors:

When you have finished, please give your survey to one of the research nurses. They will give you a gift certificate as a token of our appreciation. Thank you for your generous time and effort.

APPENDIX E

Good morning/afternoon and welcome to the Pain and Coping in Elders (PACE)study. My name is ****** and I am here to assist you with any problems or questions you may have. Before we begin, I need to ask you a question that may seem a little unusual. However, it is important, so please bear with me.

I am going to give you exactly one minute to answer this question, so time is very important. Do you have any questions?

Are you ready?

When I say go, please name as many animals as you can in one minute.

Ready, set, go!

of
animals_____

Eligible participants

Will be given the questionnaire.

Ineligible participants

Thank you for answering this question. I appreciate your willingness to participate in this study and the time you spent talking to me. Based on our interview today, you are not eligible to participate in the study at this time. The study investigators have determined that the PACE study questionnaire would be too burdensome for some people to answer (e.g., the questionnaire takes approximately 30-45 minutes to fill out). This does not mean that you would not be eligible for some other future study, however. The investigators are just concerned about the well-being of all study participants. Thank you again for your time.

APPENDIX F

WAYNE STATE UNIVERSITY

NOTICE OF EXPEDITED APPROVAL

TO: Karen Dunn, RN, MSN
(Institute of Gerontology)
24510 Foxmoor
Woodhaven, MI 48183

FROM: Francis G. LeVeque, D.D.S._____
Chairman, Human Investigation Committee

DATE: March 20, 2000

RE: Protocol # 03-88-00(B03)-ER; "Pain and Adaptive Coping in Elders (PACE)

The above-referenced Protocol, Information Sheet, and Consent Form were **APPROVED** following Expedited Review (Category 7*) by the B03 Chairman, for the Wayne State University Institutional Review Board (B03), for the period of **March 20, 2000** through **March 19, 2001**.

> **EXPIRATION DATE: March 19, 2001**

This approval does not replace any departmental or other approvals that may be required.

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date. You may **not** continue any research activity beyond the expiration date without HIC approval.

- If you wish to have your protocol approved for continuation after the above approval period, please submit a completed Continuation Form at least <u>six weeks</u> before the expiration date. It may take up to six weeks from the time of submission to the time of approval to process your continuation request. **Failure to receive approval for continuation before the expiration date will result in the automatic <u>suspension</u> of the approval of this protocol on the expiration date. Information collected following <u>suspension</u> is unapproved research and can <u>never</u> be reported or published as research data.**
- If you do not wish continued approval, please submit a completed Closure Form when the study is terminated.

All changes or amendments to your protocol or consent form require review and approval by the Human Investigation Committee (HIC) **BEFORE** implementation.

You are also required to submit a written description of any adverse reactions or unexpected events on the appropriate form (Adverse Reaction and Unexpected Event Form) within the specified time frame.

*Based on the Expedited Review List , Revised November, 1998
c: Ann L. Horgas, Ph.D., Institute of Gerontology, 87 E. Ferry, 226 Knapp

WAYNE STATE UNIVERSITY

NOTICE OF EXPEDITED CONTINUATION APPROVAL

TO: Karen S. Dunn
(College of Nursing/Institute of Gerontology)
24510 Foxmoor
Woodhaven, MI 48183

FROM: Francis G. LeVeque, D.D.S. _____
Chairman, Human Investigation Committee

DATE: March 5, 2001

RE: Re-review of Protocol #: 03-88-00(B03)-ER "Pain and Coping in Elders" No funding requested

The above-referenced protocol and Continuation Form, submission dated 02/12/01 and received in the HIC Office on 02/21/01, were **APPROVED** following Expedited Review by the Chairman of the Wayne State University Institutional Review Board (B03) for the period of **March 5, 2001 through March 4, 2002.**

> ### EXPIRATION DATE: March 4, 2002

This approval does not replace any departmental or other approvals that may be required.

Federal regulations require that all research be reviewed at least annually. **It is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date.** You may **not** continue any research activity beyond the expiration date without HIC approval.

- ◆ If you wish to have your protocol approved for another year, please submit a completed Continuation Form at least **six weeks** before the expiration date. It may take up to six weeks from the time of submission to the time of approval to process your continuation request.
  Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol on the expiration date. Information collected following suspension is unapproved research and can never be reported or published as research data.

- ◆ If you do not wish continued approval, please submit a completed Closure Form when the study is terminated.

All changes or amendments to your protocol or consent form require review and approval by the Human Investigation Committee (HIC) **BEFORE** implementation.

You are also required to submit a written description of any adverse reactions or unexpected events on the appropriate form (Adverse Reaction and Unexpected Event Form) within the specified time frame.

WAYNE STATE UNIVERSITY

Notice of Expedited Amendment Approval

To: **Karen S. Dunn**
College of Nursing/Institute of Gerontology
24510 Foxmoor
Woodhaven, MI 48183

From: Francis G. LeVeque, D.D.S. ___
Chairman, Human Investigation Committee

Date: March 5, 2001

RE: **Expedited Amendment to Protocol #:** 03-88-00(B03)-ER "Pain and
Coping in Elders (PACE)" Source of Funding: No funding requested

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The following requested change(s) to the above-referenced protocol have been
APPROVED following **expedited review**, and are effective immediately.

- Receipt of a PI-initiated protocol amendment (Sample size was increased from 100
  to 200 on the basis of power analysis--200 research questionnaires will be
  administered to a sample of community—dwelling adults; the use of the "Research
  Screener" was eliminated; addition of a research questionnaire to be administered to
  participants in a group interview format, with compensation of a $5 gift certificate
  given to participants). The flyer has been changed for clarity. An Information Sheet
  will be used rather than a consent form. All items submitted on behalf of the PI on
  February 12, 2001.

This protocol, as amended, will be subject to annual review by **March 19, 2001.**

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ABSTRACT

ADAPTATION TO CHRONIC PAIN:
RELIGIOUS AND NON-RELIGIOUS COPING IN JUDEO-CHRISTIAN ELDERS

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December 2001

Advisor:	Dr. Ann Horgas
Major:	Nursing
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The purpose of this cross-sectional, correlational study was to examine the relationships between chronic pain, the use of religious and non-religious coping, and the health outcomes of functional ability, depression, and spiritual well being. Specifically, three research questions were addressed: (1) What are the relationships between background contextual factors, pain intensity, and the use of religious and nonreligious coping, (2) What is the relationship between pain intensity and the three health outcomes, and (3) Does the use of religious and nonreligious coping strategies mediate the relationship between pain and the three health outcomes? Structural equation modeling was used to test a middle-range theory of adaptation to chronic pain (ACP), derived from the Roy Adaptation Model.

The study sample consisted of 200 community-dwelling older adults from a Midwestern city. The mean age was 76 years. 77% were female and 23% were male; 79.5% were Caucasian and 20.5% were Non-white. The results of

correlational analyses indicated that age, gender, and race were not significantly related to the level of pain intensity experienced by the elders. Women (β = .16) and Non-white participants (β = .36) reported using religious coping strategies more often than did men and Whites. Higher pain intensity was found to be related to higher levels of functional disability (β = .46), depression (β = .27), and lower levels of spiritual well-being (β = -.16), after controlling for other variables in the model. Elders with higher pain intensity reported using more collaborative religious coping strategies and non-religious behavioral coping strategies to manage their pain. The use of religious coping and non-religious coping strategies did not mediate the relationship between total pain intensity and the three health outcomes. However, elders that reported using religious coping more often were less functionally disabled (β = -.11), less depressed (β= -.26), and had higher levels of spiritual well-being (β = .58). Elders that were more functionally disabled used more non-religious coping strategies. Thus, the results of this study supported the importance of both religious and non-religious strategies for coping with chronic pain among elderly adults. Implications for nursing research and practice will be discussed.

AUTOBIOGRAPHICAL STATEMENT

KAREN S. DUNN

Education

Wayne State University	PhD, Nursing	2001
Valdosta State University	MSN, Nursing	1997
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Honors/Awards

1996-97	Awarded Professional Nurse Traineeship from Valdosta State University.
2000	First Place, Institute of Gerontology Spring Poster Session. The prevalence of prayer as a spiritual treatment modality in elders. Institute of Gerontology Spring Poster Session; Wayne State University, Detroit, Michigan.
1998-2001	Graduate Research Traineeship, Institute of Gerontology, Wayne State University.
2001	Dissertation Research Award. Adaptation to chronic pain: Religious and Non-religious coping in Judeo-Christian elders. (Dissertation, Wayne State University).

Publications

Horgas, A. L., & **Dunn, K.** (2001). Pain in nursing home residents: Comparison of residents' self-report and nursing assistants' perceptions. Journal of Gerontological Nursing.

Dunn, K. S. (in press). The efficacy of physical restraints in institutionalized elders. Paper submitted for publication. . Journal of Gerontological Nursing.

Dunn, K. S., & Horgas, A. L. (2000). The prevalence of prayer as a self-care treatment modality in elders. Journal of Holistic Nursing.

Professional Memberships

1998-present	Midwest Nursing Research Society
1998-present	Gerontological Society of America
1999-present	National Institute of Healthcare Research
2001-present	Sigma Theta Tau