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HEALTH-PROMOTING BEHAVIORS, HOPE, AND HEALTH-RELATED QUALITY  
OF LIFE IN PERSONS IMPACTED BY PARKINSON'S DISEASE

BY

AMY K. FORBES

A dissertation submitted in partial fulfillment of the requirements for the degree

Doctor of Philosophy

Major in Nursing

South Dakota State University

2017

HEALTH-PROMOTING BEHAVIORS, HOPE, AND HEALTH-RELATED  
QUALITY OF LIFE IN PERSONS IMPACTED BY PARKINSON'S DISEASE

This dissertation is approved as a creditable and independent investigation by a candidate for the Doctor of Philosophy in Nursing degree and is acceptable for meeting the dissertation requirements for this degree. Acceptance of this does not imply that the conclusions reached by the candidates are necessarily the conclusions of the major department.

Kay Foland, PhD, RN, PMHNP-CNP

Dissertation Advisor

Date

Mary Minton, PhD, RN, CNS

Head, Department of Nursing

Date

Dean, Graduate School

Date

This dissertation is dedicated to my mom. And for others with chronic illness who struggle to maintain quality of life.

“Hope” is the thing with feathers –  
That perches in the soul –  
And sings the tune without the words –  
And never stops – at all –  
  
And sweetest – in the Gale – is heard –  
And sore must be the storm –  
That could abash the little Bird  
That kept so many warm  
  
I’ve heard it in the chilliest land –  
And on the strangest Sea –  
Yet, never in Extremity,  
It asked a crumb – of Me.  
  
*Emily Dickinson (C.1891/1960)*

## ACKNOWLEDGMENTS

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A special thank you to my colleagues and PhD *sistas* in the doctoral program. The joy, laughter, and tears together has made this journey more meaningful than I could have imagined.

Thank you to my husband and children who were patient every time I said I needed to write just five more minutes. Thank you to my dad for encouraging me and for saying, “Education is something no one can take away from you.” Thank you for the life lessons that you teach me every day. I love you to the moon and back.

Finally, I want to thank the persons with Parkinson’s disease that shared their time and experiences with me, and my mother who had such tough days with Parkinson’s disease, yet always put on a smile. Thank you for being my inspiration, Mom, for being the wind beneath my wings. Your love is always with me and eternally supports me.

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## ABBREVIATIONS

<i>B</i>	Beta Coefficient
<i>df</i>	Degrees of Freedom
<i>M</i>	Mean
<i>N</i>	Total Sample
<i>P</i>	Significance level
<i>r</i>	Pearson Product-moment Correlation Coefficient
<i>SD</i>	Standard Deviation
<i>SEM</i>	Standard Error of the Mean
<i>t</i>	Statistical test to compare difference om group means
PDF	Parkinson's Disease Foundation
HRQOL	Health-Related Quality of Life
PDQ	Parkinson's Disease Questionnaire (measures quality of life)
HHI	Herth Hope Index- measures hope
HPLP	Health-Promoting Lifestyle Profile (measures health-promoting behaviors)
H&Y	Hoehn and Yahr (stage of Parkinson's disease score)

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## ABSTRACT

HEALTH-PROMOTING BEHAVIORS, HOPE, AND HEALTH-RELATED QUALITY  
OF LIFE IN PERSONS IMPACTED BY PARKINSON'S DISEASE

AMY FORBES

2017

**Objective:** The purpose of the study was to determine the relationship between hope, health-promoting behaviors, and health-related quality of life (HRQOL) in persons with Parkinson's disease.

**Background:** The incidence of Parkinson's disease is high in Midwest and Northeast regions of the United States. Parkinson's disease affects motor and non-motor symptoms and has a variety of complications. Parkinson's disease is related to genetic and environmental factors. HRQOL decreases in Parkinson's disease; thus, the effect of hope and health-promoting behaviors on health is crucial as the disease advances.

**Methods:** A descriptive correlational design was used to guide the study. A convenience sample of persons with Parkinson's disease who completed three questionnaires was used to measure health-promoting behaviors and HRQOL while modifying for disease severity.

**Results:** Exploratory factor analysis was used to examine dimensions of hope, health-promoting behaviors (HPLP), and HRQOL. Confirmatory factor analysis determined goodness of fit for the structure of the study data. The construct reliability of the

confirmed factor structure model showed an adequate inter-item consistency (Cronbach's alpha 0.70, QOL = .792, HPLP = .857, and hope = .844). After meeting the assessment of the reliability test, convergent validity, discriminant validity and confirmation of model fit of the factor model, a summated scale or a composite variable was created. The summated scale variables met five assumptions of the multivariate regression method to assess for appropriateness of method used. Finally, a path analysis was constructed where together hope and HPLP explained about 62% of the variation of scores within the dependent measure in HRQOL. Hope became non-significant statistically, with the inclusion of HPLP. Effects of varying stages of disease severity and its relation to the direct effects of hope and HPLP to the dependent measure in HRQOL was contemplated.

**Conclusions:** This study advances knowledge regarding the relationship between hope, HPLP, and HRQOL in persons with Parkinson's disease. The increased knowledge raises awareness of the importance of hope and health-promoting behaviors despite various stages of disease severity.

*Key words:* hope, health-promoting behaviors, health-related quality of life, Parkinson's disease, factor analysis

## CHAPTER 1: INTRODUCTION AND BACKGROUND

### Phenomenon of Interest

Parkinson's disease is a chronic, progressive neurological disease that afflicts more than one million Americans, a number expected to double by 2030 (National Parkinson's Foundation [NPF], 2015). The main symptoms of Parkinson's disease include bradykinesia, rigidity, and tremors. These motor symptoms respond well to treatment in the early stages, but the disease also has non-motor symptoms and is progressive with a variety of complications (Winter et al., 2010). Parkinson's disease is the second-most common neurodegenerative disorder, after Alzheimer's disease (NPF, 2015). About 60,000 new cases of Parkinson's disease are diagnosed each year in the United States, and this number does not include the large number of cases that go undetected (Parkinson's Disease Foundation [PDF], 2016). The incidence of Parkinson's disease is projected to triple by 2050, an increase that is directly related to the aging population and the increased risk of developing Parkinson's disease with age. Peak incidence of the disease is typically between 70 and 79 years of age, but four percent of persons with Parkinson's disease have early onset, which is diagnosed before age 50 (PDF, 2016).

The Midwest and Northeast regions of the United States have a *Parkinson's disease belt* with higher prevalence and incidence of the disease in a nonrandom distribution. These regions report that the rate of Parkinson's disease is up to 10 times greater than other geographic areas in the United States. In addition, there is case clustering in the Midwest. Nebraska has the highest incidence of Parkinson's disease in the United States, affecting 329.3 per 100,000 people. In addition, South Dakota, North

Dakota, Minnesota, and Iowa have the highest incidence of people with Parkinson's disease in America. These rural states are also recognized for their high agriculture productivity and use of heavy insecticides and pesticides in farming areas (American Parkinson's Disease Association [APDA], 2012). According to the South Dakota Parkinson Foundation (2016) there are 3,000 persons in South Dakota that have Parkinson's disease.

Both genetic and environmental factors contribute to the likelihood of contracting Parkinson's disease. Although men are one-and-a-half times more likely to develop Parkinson's than women, research is not conclusive about whether this difference is due to genetics, hormones, or behavioral differences (NPF, 2015). Two thirds of patients with Parkinson's disease have no family history of the disease (Center for Disease Control [CDC], 2015). Having a first-degree relative with Parkinson's, such as a parent or sibling, increases the risk of Parkinson's disease by four percent to nine percent compared to the general population (NPF, 2015). Thirteen gene mutations are associated with Parkinson's disease. Environmental factors alone do not cause Parkinson's disease unless there is also a genetic risk. A common analogy relating the causative factors for Parkinson's disease is that genetics is the gun, but something in the environment pulls the trigger (PDF, 2016).

Exposure to pesticides, chemicals such as manganese, rural living, farming, and well water are all known environmental risks that increase the rate of Parkinson's disease (NPF, 2015; Owens, 2008). Ethnically similar individuals who are genetically susceptible to Parkinson's disease reside in this area of the country (Wright Willis, Evanoff, Lian, Criswell, & Racette, 2010). For example, the Spellman-Muenter family in Iowa links 200 cases of Parkinson's disease to kindred who have genes associated with



Parkinson's disease (Gwinn, 2009). Furthermore, both the area of the country (which relates to the exposure of environmental toxins) and a person's ethnicity (which increases genetic risk) may lead to an increase of Parkinson's disease for people in the Midwest and Northeast regions of the United States.

### **Health-Related Quality of Life**

Quality of life often decreases when a person goes through an experience as is threatened can a person understand the important connection between humanity and human dignity. Patients with Parkinson's disease often lose dignity when they are no longer able to care for themselves, interact with their families, or participate in their communities, thereby rendering them without a sense of belonging. When people maintain health-related quality of life (HRQOL) and increased hope, they also maintain their dignity. According to the American Nurses Association (ANA, 2015), nurses are obligated to uphold the first provision of the *Code of Ethics* for nurses and act with compassion and appreciation for human dignity (p. 1). This underlying provision respects the patient's basic needs, values, and lifestyle, and ultimately leads to an overall betterment of humanity.

Parkinson's disease is associated with daily physical limitations, compromised communication, and eventual decreased cognitive functioning. Parkinson's disease affects more than physical functioning; it also contributes to psychosocial malfunctioning. According to Welsch et al. (2003), depression, anxiety, and decreased social interaction are common in patients with Parkinson's disease. All of these factors may decrease HRQOL. Along with the decline in motor symptoms, non-motor symptoms, such as depression, anxiety, and cognitive impairment, as well as fatigue,

pain, sleep, and bladder problems, contribute to lower HRQOL (Kadastik-Eerme, Rosenthal, Paju, Muldmaa, & Taba, 2015).

HRQOL includes the following domains: physical functioning, physical role, bodily pain, general health perceptions, vitality, social functioning, emotional functioning, and mental health (Sigstad, Stray-Pederson, & Froland, 2005). In contrast to acute diseases wherein a cure is the ultimate goal, the goal of treating Parkinson's disease is to minimize symptoms and improve HRQOL. Welsch et al. (2003) developed a model for recognizing factors that affect quality of life in patients with Parkinson's disease. These factors include a multitude of measures that contribute to quality of life for those with Parkinson's disease, including physical function, mental/physical/emotional wellbeing, self-image, health related distress, cognitive function, communication, sleep and rest, eating, role function, energy/fatigue, and sexual function.

The Japanese Association of Patients with Parkinson's Disease found that patient education led to better HRQOL (Shimbo et al., 2004). In the Netherlands, researchers concluded that Parkinson's disease patients who have autonomic dysfunctions, nighttime sleep problems, and cognitive dysfunction are at risk for deterioration of HRQOL.

Of all the determinants contributing to HRQOL, depression is the strongest and the most common factor associated with decreased HRQOL in patients with Parkinson's disease (Kadastik-Eerme et al., 2002). Feelings of hopelessness are common in those who are clinically depressed (Abramson, Alloy, & Metalsky, 1989), and hopelessness concerning the future is one the main characteristics of depression (Beck, Rush, Shaw, & Emery, 1979). Therefore, having hope is pertinent to giving meaning and value to life; the contrary, the loss of hope, has been found to decrease quality of life (Rustoen, 1995).

## **Hope**

Hope is a positive belief that allows people with chronic illnesses to overcome devastating diseases and become survivors. Frankl, an Australian psychiatrist who spent years as a prisoner in concentration camps during World War II, describes an example of hope related to devastation. Frankl observed that if people lose hope, they do not live long. He believed people with hope have meaning in their lives, but if they have no hope, they have no meaning (Frankl, 1959).

In a study of 96 newly diagnosed cancer patients in Norway, hope was found to be a coping strategy to enhance quality of life (Rustoen, 1995). Hope contributes positively to health and is healing for those going through a period of stress or loss. A hopeful mindset helps persons cope in order to attain higher quality of life (Farran, Herth, & Popovich, 1995).

The concept of hope is essential for everyone, is applicable to all populations and all areas of life, and is vital for those suffering with a debilitating chronic disease like Parkinson's. Nurses have the moral obligation to help their patients nurture hope when faced with illness and disease (Simpson, 2004). Travelbee (1971) describes nursing as an interactive process and notes hope is a future-oriented quality in which people look forward to a time when life will be meaningful. Hope is a positive, joyful expectation that something good is going to happen. In medicine, hope is essential to promoting health and healing. By better understanding the function of hope in healing, nurses can help restore their patients' health.

Hope is often seen as an action (Green, 1977) and inspires persons to take action to utilize health-promoting behaviors (Dufault & Martocchio, 1985). Participating in

health-promoting behaviors for persons with cancer improves their quality of life. Cancer survivors, compared to the public, do not participate in equal levels of exercise, eating healthy, and maintaining a healthy weight (Meraviglia, Stuijbergen, Parsons, & Morgan, 2013). Nurses also must recognize the signs of hope and hopelessness in their patients' actions, and respond accordingly.

### **Health-Promoting Behaviors**

The social science of health promotion benefits the general public by teaching people to make better health choices (Ruth, 2015). According to McCutcheon (2015), health-promoting behaviors relate to the following sciences: biological, physical, psychosocial, and environmental. The common goal is improving health. McCutcheon described empowerment, participation, and community as attributes of health-promoting behavior. McCutcheon concluded that health-promoting behaviors lack definition and application in nursing literature.

Whitehead (2004) states nurses use terms like health promotion and health education interchangeably and the focus of health promotion should be more on community driven health reform, community empowerment, social objectives, and health policy. He criticizes some nursing theories for using a health education model and calling it health promotion.

Other nurse researchers have also scrutinized nursing literature on the contextualization of the term health promotion. Kemppainen, Tossavainen, and Turunen (2012) consider the focus of health promotion in nursing to be on disease prevention and needs to be overhauled to a health promotion philosophy.

A few researchers relate their definition of health promotion and health-promoting behaviors back to the World Health Organization and the importance of exerting control over health and health determinants to improve health (WHO, 2015). Polvsen and Borup (2011) refer to health promotion as the combination as the social and political process to regulate health determinants and improve health and quality of life. The College of Public Health (2013) describe the improvement on individual, group, community and system changes to improve overall knowledge, skills, attitudes and health behaviors.

Health-promoting behaviors are actions focused on developing levels of wellbeing and realizing health potential on an individual level, within families and communities, and throughout societies (Pender, 1987). Some examples of activities utilized for health promotion for persons with Parkinson's disease relate to healthy eating/diet, physical activity/exercise, stress level, sleep, inner peace, and self-esteem (Fowler, 1997).

### **Summary Hope, Health-Promoting Behaviors, and Health-Related Quality of Life**

The perspective of a person with respect to hope, health promotion, and HRQOL plays a pivotal role in engaging health-promoting behaviors for people with Parkinson's disease and patient outcomes. Hope is foundational to healing and can empower people to choose health-promoting behaviors. Hope is related to action in empirical studies, and this action can parallel health-promoting behaviors (Fowler, 1997). Fowler's (1997) study showed a positive relationship between hope and a health-promoting lifestyle in persons with Parkinson's disease who completed the Herth Hope Index (HHI) and Health-Promoting Lifestyle Profile II (HPLP II). The literature lacks further support on the association between hope and health-promoting behaviors.

The association between Parkinson's disease and decreased HRQOL has been studied extensively worldwide (Caap-Ahlgren & Lannerheim, 2002; Haahr, Kirkevold, Hall, & Ostergaard, 2011; Leonardi et al., 2012; Miyashita et al., 2011; Post et al., 2011; Qin et al, 2009; Visser et al., 2009; Weintraub, Moberg, Duda, Katz, & Stern, 2004; Winter et al. 2010a, 2010b, 2011). However, there is limited research in the United States (Welsch et al., 2003). This creates a gap in the literature, given that the United States has the highest prevalence of Parkinson's disease in the world. Knowledge gained in this study will provide insight into ways to improve health, health-promoting behaviors, and HRQOL for those with Parkinson's disease. According to Pender, Murdaugh, and Parsons (2015) the purpose of nursing research is to create knowledge to enhance health. Enhancing health parallels easing the burden of disease.

Based on the literature by Fowler's (1997) there is a positive relationship between hope and a health-promoting lifestyle in persons with Parkinson's disease who completed the Herth Hope Index (HHI) and Health-Promoting Lifestyle Profile II (HPLP II) but the literature lacks further support on the association between hope and health-promoting behaviors. Hope interventions have improved quality of life in persons with cancer (Herth, 2000). The literature shows that health-promoting behaviors in a variety of populations including persons with breast cancer, HIV, multiple sclerosis, polio, and Parkinson's disease all relate to high levels of hope (Bouchard, 1992; Fowler, 1997; & Harrison, 1993).

The effect hope and health-promoting behaviors play on HRQOL is critical because health is so much more than absence of disease. For persons with Parkinson's disease and others with a chronic illness, health must be seen alongside a continuum with

disease. The severity of illness in Parkinson's disease severely decreases HRQOL (Global Parkinson's Disease Survey Steering Committee, 2002). Initiating hope and health-promoting behaviors can lessen the downward progression of the disease. By having stronger levels of hope and health-promoting behaviors, persons with Parkinson's disease will be better equipped to manage as their disease progresses and maintain their level of health, despite disease.

### **Purpose of the Study**

The purpose of this study is to examine the relationship between the concepts of hope, health-promoting behaviors, and HRQOL in people with Parkinson's disease. The hypothesis is a stronger level of hope and health-promoting behaviors will correspond to a higher HRQOL, modifying for disease severity and progression.

The aims of this study are as follows: (1) to conduct a comprehensive exploration of the relationships among hope, health-promoting behaviors, and HRQOL; (2) to test for a moderating effect of hope on the relationship between health-promoting behaviors and HRQOL; and (3) to explore the effect of disease severity on the relationship among hope, health-promoting behaviors, and HRQOL.

### **Research Questions**

1. What is the level of hope in persons with Parkinson's disease?
2. What is the relationship between hope and health-promoting behaviors on HRQOL in persons with Parkinson's disease?
3. What is the relationship among hope, health-promoting behaviors, HRQOL, and disease severity?

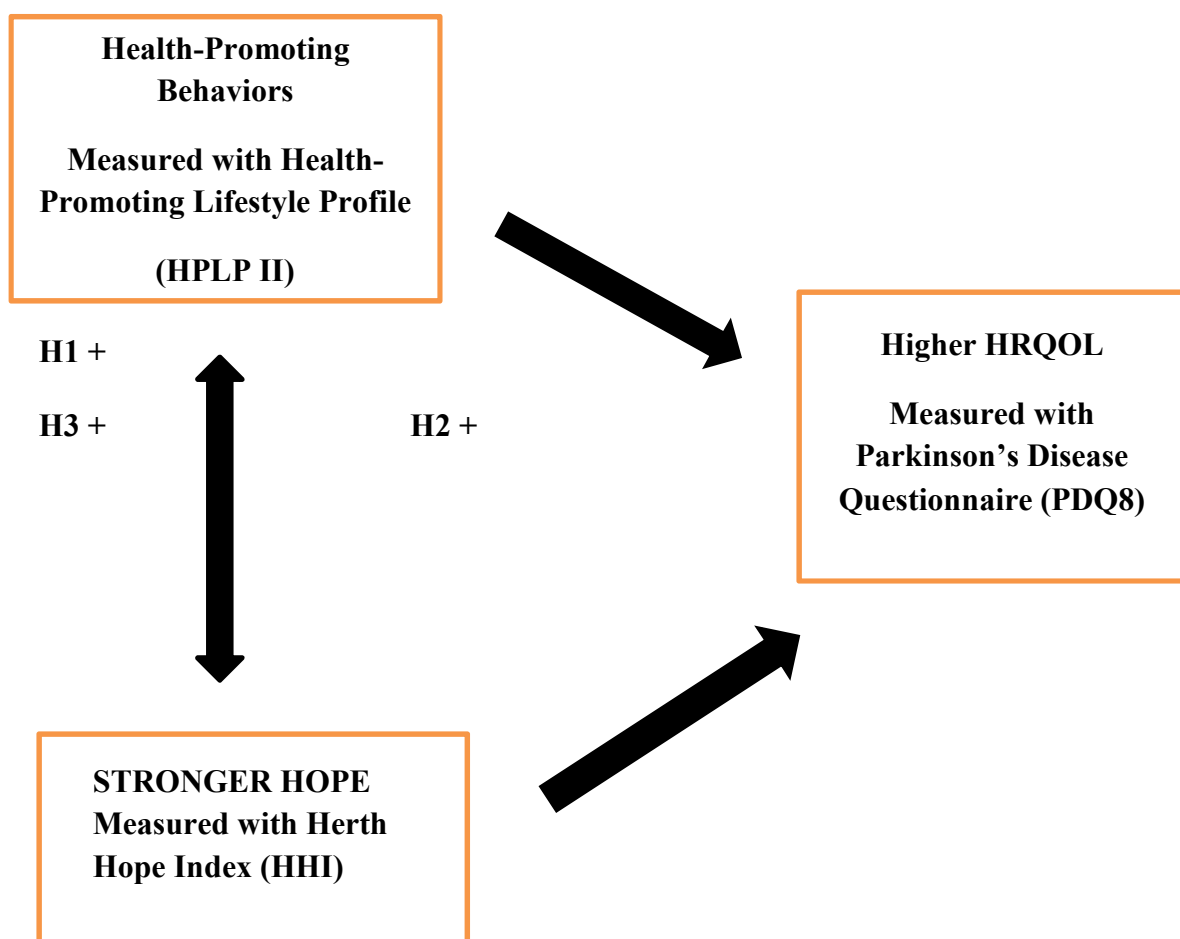


Figure 1. Study framework.

### Research Hypotheses

Three hypotheses are tested following the study framework. The first hypothesis (H1+) predicts that persons with Parkinson's disease have hope. The second hypothesis (H2+) predicts that health-promoting behaviors will correspond to a stronger measure of hope, which signifies a positive relationship between hope and health promoting behaviors. Health-promoting behaviors and stronger level of hope are expected to lead to a positive impact on HRQOL. The final hypothesis (H3+) proposed that higher levels of hope and health promoting behaviors will correspond with higher HRQOL, modifying for disease severity and progression which is measured by the patient's self-report in the



Hoehn and Yahr scale (see Appendix B).

### **Significance of the Study and Nursing Perspective**

Some of the overarching goals of Healthy People 2020 include increasing the years of healthy life and the quality of life for all Americans (U.S. Department of Health and Human Services, 2012). Nurses can contribute to the future of healthcare by promoting health for those who suffer from Parkinson's disease and other debilitating diseases. This goal is especially important in later stages of Parkinson's disease when medical treatment and medication no longer help fight the disease, and the focus of treatment is to improve quality of life. An increase in the number of people with Parkinson's disease will require an increased number of nurses to care for them. Nurses have an opportunity to help people cope with the wide variation of challenges from this incurable lifelong disease. Race, education, and income are significant and independent factors when determining the level of disability for Parkinson's disease patients. Researchers found health disparities in patients with Parkinson's disease who are both African American and lower income. African Americans and those with lower socioeconomic status had progressed disease and further disability in disease management upon seeking treatment. These disparities lead to earlier loss of independence ("Parkinson's Disparities," 2010).

A better understanding of the relationship among hope, health-promoting behaviors, and HRQOL will help nurses, patients, and caregivers promote a potential hope intervention and encourage health-promoting behaviors for those with Parkinson's disease. Attributes of hope can increase coping mechanisms, which lead to improved quality of life. Nurses play a significant role in influencing hope and, therefore, quality of

life (Herth, 2000).

Although the connection between hope and quality of life has been studied in people with cancer, it has not been studied in people with Parkinson's disease. Herth (2000) established that quality of life improves in cancer patients who receive hope intervention, and Pender (1987, p.4) noted that one of the national health professional goals is to promote health for those persons with chronic diseases or disability. Although health-promoting behaviors and hope have been studied frequently in persons with chronic illnesses, the literature reveals that this relationship was examined once in persons with Parkinson's disease (Fowler, 1997). Nurses are the leading section of health professionals; therefore, they have the opportunity to uphold national health promotion goals. Supporting a culture of health promotion is a significant role of nurses (Savage & Kub, 2009).

Another significant role for nurses is to encourage hope. Watson's Caring Model, written in 1988, describes instilling hope as part of the second carative factor of nursing (Watson, 2012). Nurses can integrate hope into their plan when caring for their patients. Nurses can also encourage patients to practice health-promoting behaviors influencing their overall health outcomes. Notably, by promoting health behaviors and encouraging hope, nurses show they value the HRQOL of persons with Parkinson's disease in all settings. Enhancing hope for patients with Parkinson's disease will, in turn, improve HRQOL and human dignity for those struggling with this disease.

### **Definitions**

**Theoretical Definition Hope.** A multidimensional energy, always present and changing, which is described by a positive, yet unclear belief of reaching a future benefit

(Dufault & Martocchio, 1985, p. 380). Hope is an individualized future orientated experience that offers possibility and optimism despite uncertainty.

**Operational Definition Hope.** Hope is always changing, particularly when overcoming life events such as chronic illnesses like Parkinson's disease or aging. In this study, hope is determined by a measurement at a point in time on the Herth Hope Index (HHI) scale.

**Theoretical Definition Health-Related Quality of Life (HRQOL).** HRQOL relates to an individual's perception of their well-being related to disease and health status (Winter, 2010a). Dignity has also been noted as a fundamental component of quality of life (Manthorpe et al., 2010). In this study, quality of life is limited to HRQOL, which has many facets. The focus is on the following domains related to Parkinson's disease: "mobility, activities of daily living, emotional well-being, stigma, social support, cognition, communication and bodily discomfort," (Rodriguez-Violante et al., 2013, p.11).

**Operational Definition Health-Related Quality of Life (HRQOL).** In this study the Parkinson's Disease Questionnaire-8 item version (PDQ-8) will measure HRQOL and specifically the domains of "mobility, activities of daily living, emotional well-being, stigma, social support, cognition, communication and bodily discomfort," (Rodriguez-Violante et al., 2013, p.11).

**Theoretical Definition Health-Promoting Behaviors.** The World Health Organization (WHO, 2015) defines health promotion as "the process of enabling people to increase control over their health and its determinants, and thereby improve their health." Health-promoting behaviors relate to "activities directed toward increasing the

level of well-being and actualizing the health potential of individuals, families, communities and societies” (Pender et al., 2015, p. 4).

**Operational Definition Health-Promoting Behaviors.** In this study, health-promoting behaviors will be measured using Pender’s Health-Promoting Lifestyle Profile II (HPLP- II). The scale for HPLP-II measures self-actualization, health responsibility, exercise, nutrition, interpersonal support, and stress management (Walker, Sechrist, & Pender, 1987).

**Theoretical Definition Parkinson’s Disease.** Nearly 200 years ago, Dr. James Parkinson of London noted a phenomenon he called the *shaking palsy*. The first characteristic he noted included a tremor at rest, stooped posture, and a shuffling gait (Parkinson, 1817). Three classic signs of the disease are tremor at rest, rigidity, and slowness. Two of these three clinical manifestations are necessary for diagnosis (Bunting-Perry & Vernon, 2007).

**Operational Definition Parkinson’s Disease.** Parkinson’s disease is a chronic progressive neurological disease with motor, non-motor, and neuropsychiatric symptoms, which mainly effects the elderly. Parkinson’s disease is characterized by a loss of dopamine in the brain (Bunting-Perry & Vernon, 2007).

**Theoretical Definition Disease Severity.** Disease severity indicates the amount of disease in the body. In Parkinson’s disease the greater the amount of motor disability leads to greater disease severity. Disease severity does not indicate disease progression, it is only the statement of where the patient is rated at the current time (Bunting-Perry & Vernon, 2007).

**Operational Definition Disease Severity.** Hoehn and Yahr (H&Y) staging

measures the disease severity of Parkinson's disease in the study. The mildest stage with unilateral symptoms is H&Y 1. A wheelchair-bound or bed-ridden state is the most severe stage, which is H&Y 5 (Hoehn & Yahr, 1967).

## **CHAPTER 2: REVIEW OF LITERATURE**

### **Introduction**

The purpose of this study is to describe the relationship between hope, health-promoting behaviors, and quality of life in people with Parkinson's disease. The critical literature review provides a foundation for examining this relationship. The literature review begins with an examination of both the prevalence and health consequences of Parkinson's disease. It synthesizes findings on the concepts of hope, health-promoting behaviors, and health-related quality of life (HRQOL). Literature was reviewed by concepts and in phases. The theoretical framework guiding the study is also described.

### **Prevalence of and Health Cost Related to Parkinson's Disease**

As the number of persons with Parkinson's disease grows the costs of treating them also increases. The economic impact of Parkinson's disease is an estimated \$25 billion per year in the United States (PDF, 2016). The financial burden for Parkinson's disease patients combines direct costs and indirect costs of the disease, such as treatment, social security payments, lost income from work, and homecare. Medications alone cost an individual with Parkinson's disease \$2,500 a year, and therapeutic surgeries can cost around \$100,000 dollars per patient (PDF, 2016).

The highest prevalence of the disease in the United States is in Nebraska, followed by South Dakota (CDC, 2015). The heartland of America is well known for farming communities that heavily use insecticides and pesticides. Studies have noted the occupational risks of farming associated with Parkinson's disease, illustrating that the risk of Parkinson's disease rises with exposure to pesticides --(Kenborg, Lassen, Lander, & Olsen, 2012; Wright Willis, Evanoff, Lian, Criswell, & Racette, 2010). Common

pesticides are neurotoxic and can trigger changes in the brain that are similar to the loss of neurons in the brain and other pathological features that cause idiopathic Parkinson's disease (Allen & Levy, 2013).

The Agriculture Health Study also suggests that contact with pesticides increases the danger of Parkinson's disease (Kamel et al., 2007). The study initially compared 79,557 persons who applied pesticides in relation to self-reported Parkinson's disease. Applying the chemical paraquat was associated with 87 prevalent cases of Parkinson's disease. The odds ratio for the incidence of Parkinson's disease for those that applied chemical compared to the cohort control was 2.3%, confidence interval: 1.2, 4.5, and  $p = .0009$ . The study noted that certain chemicals may increase Parkinson's disease risk, a premise that needs further investigation. A limitation of the study was the dependence on self-reporting of disease.

A Danish study of gardeners exposed to pesticides concluded that an association between a small-dose exposure to pesticides and the risk for Parkinson's disease could not be ruled out (Kenborg et al., 2012). The study of 3,124 male members of the Danish Union of Gardeners indicated a weak but dose-related association of pesticide exposure and diagnosis of Parkinson's disease using hospital-registered data (Kenborg et al., 2012).

A number of studies over the past 25 years suggest well water contaminated with agricultural pesticides play a role in the etiology of Parkinson's disease (Gatto et al., 2009; Marder et al., 1998; Morano et al., 1994; Smargiassi et al., 1998; Wang, Fang, Cheng, Jiang, & Lin, 1993; Wechsler et al., 1991; Wong et al., 1991). Several of these reports were small, less than 100 cases and all were self-reported exposure to pesticides.

Gatto, Cockburn, Bronstein, Manthripragada, & Ritz (2009) found consuming well water contaminated by agricultural pesticides increases the relative risk of Parkinson's disease. This study took place between 2001 and 2007 in Central Valley California, which is well known for its high agricultural activities. This study did not rely on self-reporting, but sampled the water for six different pesticides and compared to documented data. They completed a geographic system of controls and found 368 cases with Parkinson's disease had consumed private well water 4.3 years longer than the 341 controls enrolled in their study. The study supports consuming well water contaminated with pesticides has an associated risk of Parkinson's disease.

### **Summary**

As the population ages, the number of persons with Parkinson's disease increases, and so does the financial burden of the disease (Achey et al., 2014). The financial loss and burden of Parkinson's disease in cost of medicines and treatments does not compare to the emotional loss and suffering from disease. The growing number of persons with Parkinson's disease is concerning, especially in the agricultural heartland of America where the disease prevalence and risk for the disease is already high compared to other areas of the United States (CDC, 2015; Kamel et al., 2007; PDF, 2016).

### **Hope**

The key literature search for *hope* examined literature from the EBSCOhost database (incorporating the following databases CINAHL, MEDLINE, and PsychINFO). The years were limited from 2000 to 2017. Next, the search for terms *hope* and *nursing* were combined. *Nursing* was added to the search to decrease the number of articles,



which was focused on *hope* for a cure or *hope* for stem cells in Parkinson's disease. Pertinent literature from earlier years was also included in the literature review.

Hope first appeared in healthcare literature in the mid-1960s with a focus on spirituality (Lynch, 1965). Since then, many researchers have redefined hope. According to Erickson (1964), hope is part of the developmental process as the first stage of development, an outcome of basic trust versus mistrust, which is the basis for experiencing security with an attachment figure. The quality of the attachment experience contributes to later experiences of either hope or despair. An infant or young child's attachment to a parental figure provides a foundation that can either encourage the child to hope or to despair. A good role model of hope can have a positive effect on a child's development; even in situations promoting negative effects of home, however, an individual can choose to overcome any trust barriers developed in childhood to potentially yield an outcome of hope. Further studies showed that hope had a positive correlation with social support (Edwards, Ong, & Lopez, 2007; Heaven & Ciarrochi, 2007; Mahat, Scoloveno, & Whelan, 2002; Yarcheski, Mahon & Yarcheski, 2001; Vacet et al., 2010).

Critical literature on hope was identified by a concept analysis building on the work of Dufault and Martocchio (1985) who described hope in persons with cancer. Hope has two spheres: (1) generalized hope, where the end result is desired; and (2) particularized hope, which relates more to meaning in life. The two spheres can overlap. There are six dimensions of hope depicting experiences related to "affective, cognitive, behavioral, affiliative, temporal, and contextual" domains (Dufault & Martocchio, 1985, p. 381). Health practices, self-care agency, and health-promoting factors are positive

outcomes of hope and are consistent with Dufault and Martocchio's conceptualization of hope (Canty-Mitchell, 2001; Mahat & Scoloveno, 2001; Mahat et al., 2002; Mahon et al., 2004).

Hope differs depending on the environment, and hope changes when illness strikes. The different attributes that enable people to hope allow hope to be a unique and ever-changing process. Several patterns in the language describing hope were identified. Concepts that appeared repeatedly were as follows: hope is future orientated, requires energy, is goal orientated, and contains an element of uncertainty (Amendolia, 2010; Dorcy, 2010; Lohne & Severinsson, 2004). Other terms related to hope that appeared in the literature were power, realism, meaningful, internal, intuitive, integrative, holistic, anticipation, realism, and essential for life (Amendolia, 2010; Dorcy, 2010).

Duggleby et al. (2010) examined hope in 20 studies from a variety of countries in persons with different medical diagnoses. The authors described hope as being dynamic and future orientated, as well as being able to transcend possibilities and involve choice. Older and younger persons differed in their interactions with hope when suffering, but regardless of age, the 20 studies emphasized the importance of incorporating strategies to help those with chronic illness sustain hope.

For those afflicted with Parkinson's disease, the literature mentions a significant loss of self-esteem, which correlates to the need to promote hope, a health-promoting behavior, to improve self-esteem. Hope occurs when people have high self-esteem (Cantrell & Lupinacci, 2004; Heaven & Ciarrochi, 2007; Ritchie, 2001; Simon, Barakat, Patterson & Dampier, 2009; Vacek et al., 2010). Additionally, life satisfaction has a positive and statistically significant correlation with hope (Bronk, Hill, Lapsey, Talib &

Finch, 2007; Gilman, Dooley, & Florell, 2006; Hexdall & Huebner, 2007; Shoegren et al., 2006; Vacek et al., 2010; Valle et al., 2006; Wong & Lim, 2009).

Empirical studies suggest that religious values help with coping and have an association with increased hope. Heaven & Ciarrochi (2007) studied 784 participants and found participants who had higher religious values also had higher levels of hope. Miller and Kelly (2005) also found an elevated level of hope and optimism in persons with religious values. Their study linked religion to better mental health and having more hope improved coping mechanisms. Another study of 126 low socioeconomic minorities reported that having hope directly relates to religious coping. This study examined diaries of adolescents and discovered having hope helped buffer stress (Roesch, Duangado, Vaughn, Aldridge, & Villodas, 2010).

Hope is a construct that studies have shown to improve coping in multiple populations such as the elderly, those with cancer, spinal cord injury, mental illness, heart disease, and stroke (Bland & Darlington, 2002; Bluvol & Ford-Gilboe, 2004; Herth, 1993; Farran et al., 1995; Lohne & Severinsson, 2004). Hope improves coping skills and adaptation capacities and does not decrease as age increases (Lieberman and Tobin, 1983). In the elderly population, literature shows hope is an essential human need (Forbes, 1994).

Herth studied hope in 125 patients with recurrent cancer receiving treatment. The study was a quasi-experimental design with three groups. The first group received a hope intervention, the second group was an informational control group that received and the last group was a group that received no information other than regular hospital care. At the start of the study, the level of hope was low for all groups compared to other cancer

patients (Rustoen, 1998; Herth, 1990, Herth, 2000). A significant difference in the level of hope was found in the cancer patients related to level of energy, sleep, and concurrent losses. The hope score decreased slightly for all groups at three months. However, the hope control group did have significant higher mean hope score than the informational group ( $P=0.034$ ) and the control group ( $P=0.015$ ). The hope scores also decreased at six and nine months for the all groups, but the mean hope score for the hope intervention group remained higher than the attention group ( $P=0.032$ ) and the control group ( $P=0.025$ ) (Herth, 2000).

### **Summary of Hope**

Hope is thought to originate from the first stage of psychosocial development (Erickson, 1964). The two main spheres of hope are generalized hope and particularized hope with six domains: affective, cognitive, behavioral, affiliative, temporal, and contextual (Dufault & Martocchio, 1985) Hope occurs during chronic illnesses and promotes the healing process (Farran, Herth, & Popovich, 1995). Hope has been studied largely in populations with cancer (Dufault & Martocchio, 1985; Rustoen, 1995; Herth, 1989), in populations with chronic diseases (Duggleby et al., 2010; Lohne & Severinsson, 2004), and in healthy populations (Farran et al., 1990; Forbes, 1994). Three of the main attributes of hope are that it is future orientated, requires energy, and is goal orientated (Amendolia, 2010; Dorcy, 2010; Duggleby et al., 2010; Lohne & Severinsson, 2004).

### **Health-Related Quality of Life**

The literature search on *quality of life* surveyed literature from the EBSCOhost database (incorporating the following databases CINAHL, MEDLINE, and PsychINFO). The search was narrowed to full text and peer-reviewed articles from 2000 to 2017.

Articles specifically related to the concept of HRQOL were examined. The literature was researched using the terms *hope* and *quality of life* together. However, when limiting this process further by adding the term *Parkinson's disease*, no articles were found. Thus, the literature did not address the levels of hope and quality of life in persons with Parkinson's disease.

*Quality of life* it is an abstract idea with numerous meanings and with several conceptual definitions. Quality of life relates to culture, values, goals, and expectations HRQOL specifically relates to physical health and mental health (CDC, 2015). The literature discusses HRQOL and Parkinson's disease in a number of European studies, which are reviewed below.

Winter et al. (2010a, 2010b, 2011) completed a sequence of studies in Europe examining HRQOL in Parkinson's disease. The first study in Austria assessed HRQOL in 100 persons with Parkinson's disease and found the HRQOL score was lower than the general population (Winter et al., 2010a). Scores related to mobility and pain were high, leading to a decrease in HRQOL. Age, depression, motor fluctuations, and disease severity were the main determinants of HRQOL. Overall, the Winter et al., (2010a) study promoted social support and home care for persons with Parkinson's disease to improve their HRQOL.

Similarly, a study in Russia investigated the HRQOL in persons with Parkinson's disease. Winter et al. (2010b) noted that Parkinson's disease affects the vulnerable population of the elderly. Their study recognized the importance of assessing HRQOL in this population in order to provide better healthcare programs for the more vulnerable. In a sample size of 100 persons with Parkinson's disease, 98% of participants had moderate

or severe scores in mobility, pain, and anxiety. The control group had 74%, which is a significantly lower HRQOL score in these problem areas (Winter et al., 2010b).

The last study in the series took place in Italy, where HRQOL in Parkinson's disease showed mobility, pain, and anxiety as common dimensions reducing HRQOL (Winter et al., 2011). Other determinants that reduced HRQOL scores were increased disease severity, depression, and dementia. The results encouraged the national healthcare programs to focus on education and social support in order to improve HRQOL related to motor and non-motor symptoms (Winter et al., 2011).

The prevalence of non-motor symptoms in Parkinson's disease leads to increased disability and is associated with decreased HRQOL (Leonardi et al., 2012; Post et al., 2011; Weintraub, Moberg, Duda, Katz, & Stern, 2004;). Studies found non-motor symptoms associated with decreased HRQOL more than motor symptoms. For example, Rodriguez-Violante et al. (2013) identified clinical and demographic factors of HRQOL and anticipated decreased HRQOL among patients with advanced Parkinson's disease. The study included 177 patients with Parkinson's disease in Mexico City. The study evaluated patients using several scales, one of which was the Parkinson's Disease Questionnaire (PDQ-39) that measures quality of life of persons with Parkinson's disease. The researchers did not find an association between HRQOL and dyskinesia. Specifically, neuropsychiatric features of the disease were more problematic and associated with higher scores on the PDQ-39, which is associated with lower levels of HRQOL (Rodriguez-Violante et al., 2013).

Qin et al. (2009) determined the non-motor symptoms of depression, sleep disorders, and fatigue attributed to 61.7% of the variance of HRQOL in 391 Chinese

patients with Parkinson's disease. Motor and non-motor symptoms were measured by multiple regression analyses to determine which variables were associated with HRQOL. The study found that HRQOL improves only if support is provided for all aspects of Parkinson's disease, and not just motor symptoms.

Miyashita et al. (2011) reported all the domain of quality of life of patients with Parkinson's disease in Japan was significantly lower than in the general population. Questionnaires were sent to 1,577 persons with neurological diseases, and of the 785 who responded, 273 had Parkinson's disease. The study explored the correlation between quality of life for patients and caregivers. When depression was present in patients, there was a significant reduction on quality of life for caregivers. Patients who had decreased physical function correlated with an increase in care burden and a decrease in caregiver's quality of life.

A study in the Netherlands showed that worsening psychosocial well-being, mood, and cognitive function over a two-year period was associated with decreased HRQOL (Visser et al., 2009). Visser et al. (2009) examined 336 patients longitudinally over a two-year period, revealing that patients who have autonomic dysfunctions, nighttime sleep problems, and cognitive dysfunction are at risk for deterioration of HRQOL.

Researchers in Scandinavian countries examined quality of life in persons with Parkinson's disease. According to a Swedish study, Parkinson's disease affects not only the quality of life of the individual, but also of the family. Furthermore, the study showed that not knowing when to expect impaired mobility leads to frustration and social withdrawal in patients (Caap-Ahlgren & Lannerheim, 2002). Parkinson's disease

threatens a person's ability to maintain family and social contacts, which leads to decreased independence (Welsch et al., 2003). Researchers in Denmark explored how living with Parkinson's disease leads to a loss of independence and self-esteem (Haahr, Kirkevold, Hall, & Ostergaard, 2011).

The Global Parkinson's Disease Survey (2002) examined quality of life in 31 Parkinson's disease patients in an outpatient geriatric center in Sweden and reported disease severity as a significant predictor for HRQOL. The study showed increasing problems as the disease progressed. Even before the disease reached advanced stages, quality of life was affected.

Findley (2002) surveyed people from six countries with Parkinson's disease and discovered depression is significantly associated with quality of life. Findley's (2002) international study of 1,190 patients in six countries associated depression significantly with quality of life. Over 50% of patients had a score above 10 on the Beck Depression Inventory, indicating mild depression. However, this result was not reflected in the patient's self-assessments, as only one percent of the patients evaluated themselves as depressed.

Gage, Hendricks, Zhang, and Kazis (2003) found that veterans with Parkinson's disease had lower scores on mental and physical health scales compared to veterans with other conditions, such as heart disease, congestive heart failure, stroke, diabetes, arthritis, or lower back pain. This is a problem because, as the population ages, the number of persons with Parkinson's disease is expected to increase (Welsh et al., 2003), and this chronic progressive disease of late adulthood has no cure yet.

It is important for the healthcare professionals to focus on patients' perceptions of



quality of life and develop strategies for improving daily life for those patients (Wressle, Bringer, & Granerus, 2006). In contrast to acute diseases wherein a cure is the ultimate goal, the goal of treating Parkinson's disease is to minimize symptoms and improve HRQOL. A study using 1,200 randomly selected participants from the Japanese Association of Patients with Parkinson's Disease showed that patient education led to better HRQOL (Shimbo et al., 2004).

Winter et al. (2010a, 2010b, 2011) discussed an average of over 80% of patients with Parkinson's disease patients are dependent on cares mostly provided by family members. This high number of persons depends on others to help them with their ADLs because of their disease severity. Lou (2015) describes as severity of illness increases; fatigue severity also increases leading to decreased HRQOL. Fatigue is associated with several of the non-motor symptoms of Parkinson's including apathy, sleep disorders, cognitive dysfunction and depression.

Problems with mobility, anxiety, depression, and pain are common problems decreasing HRQOL in persons with Parkinson's disease (Winter et al., 2011). These problems could classify as possible barriers for using this model. Few studies have recognized the effect of depression in Parkinson's disease. However, the impact depression has on HRQOL is important to recognize as depression is clearly associated with lower HRQOL and health-promoting behaviors (Dowding, Shenton & Salek, 2006; Jones, Pohar, & Patten, 2009; Schrag, 2006). Withdrawing from social life is another possible barrier that could result in lower HRQOL for persons with Parkinson's disease.

### **Summary of Health-Related Quality of Life**

The conceptual meaning of HRQOL includes the following domains: physical

functioning, role physical, bodily pain, general health perceptions, vitality, social functioning, role emotional, and mental health (Sigstad et al., 2005). Fourteen studies that examined HRQOL in Parkinson's disease were reviewed. The main determinants of HRQOL were age, depression, motor fluctuations, and disease severity (Winter et al., 2010a). HRQOL is important to assess in persons with Parkinson's disease because they are a vulnerable population (Winter et al., 2010a). This leads to an opportunity to provide better healthcare programs for those who are vulnerable.

### **Health-Promoting Behaviors**

The literature search on health-promoting behaviors examined literature from the EBSCOhost database (incorporating the following databases CINAHL, MEDLINE, and PsychINFO). The search was limited to peer reviewed journals published between 2000 and 2017. Abstracts were reviewed for relevancy to nursing.

Tengland (2010) defined health promotion beginning as a public health belief and emphasizing a holistic model promoting social and economic determinants of health at a population level as well as focusing on vulnerable groups and inequality. Trembley and Richard (2011) relate health promotion to the individual, group, or community level and use a variety of approaches to improve health at an individual and environmental level.

Glanz and Maddock (2002) describe health-promoting behaviors as the activities of multiple levels that correlate with change and policy development as a result of these activities. A big outcome of the changes brought about by health-promoting behavior is an improvement in coping skills and quality of life.

Liu et al. (2009) studied women in Taiwan who had an abnormal papanicolaou test. This study had a convenience sample of 101 rural women and 14% of these women

had precancerous results. In their study, they defined health-promoting behaviors in women's health related to three aspects: health responsibility, stress management, and exercise. The researchers developed interventions to help women with positive papanicolaou results select treatment options and implement healthy behaviors.

Pender (1987) developed one of the predominant health-promotion models to describe health-promoting behaviors. This model has been published extensively within the literature and is commonly used in nursing practice (King, 1994). One strength of the health-promotion model is the scale, the Health-Promoting Lifestyle Profile (HPLP), which measures self-actualization, health responsibility, exercise, nutrition, interpersonal support, and stress management (Walker, Sechrist, & Pender, 1987). The model stresses cognitive influences on health, personal decision-making, individual control, and individual definition of health (Whitehead, 2001).

The health-promotion model by Pender works well for preventative, behavioral, health-related concepts, and disease-centered concepts (Whitehead, 2001). Stuijbergen and Rogers (1997) validated this model when they examined health-promotion behaviors related to quality of life for those with chronic conditions.

Bouchard (1992) used Pender's framework and studied health-promoting behaviors and hope in a population of 76 persons with breast cancer. Bouchard found hope correlates significantly with several items from the HPLP questionnaire. Hope has a strong relationship with health-promoting behaviors ( $p=0.001$ ), health responsibility ( $r=.396$ ), stress management ( $r=.396$ ), interpersonal relations ( $r=.396$ ), and self-actualization ( $r=.624$ ).

For the purpose of this research, health-promoting behaviors relate to Pender's (2015) definition relating to increasing health potential and well-being at multiple levels, which include individual, family, community, and society. Numerous researchers have used Pender's definition of health-promoting behaviors to help individuals achieve well-being and improve health.

Fowler (1997) discussed hope and health-promoting behaviors in persons with Parkinson's disease. The sample consisted of 42 patients with Parkinson's disease who completed the HHI and HPLP II. The study showed a moderate positive relationship between hope and a health-promoting lifestyle ( $r=.40$ ,  $p=.008$ ). Significant correlations related to hope were health-promoting lifestyle, spiritual growth, and interpersonal relations. Findings showed women had a higher mean score in physical activity than males ( $t=-2.28$ ,  $p=0.03$ ). Adults with Parkinson's disease had a low level of physical activity compared to the general population. Even though the population of this study has a progressive debilitating disease, they were involved in health-promoting behaviors and were considered hopeful.

Stuifbergen (1995) found similar results in her study with 61 women with multiple sclerosis. In this descriptive correlational study, she noted a strong correlation between health-promoting behaviors and quality of life. Health-promoting behavior subscales of physical activity and nutrition on the HPLP II correlated significantly with objective measures of activity and nutrition. Low level of activity in persons with this chronic disease may be seen when persons do not over exert due to fatigue, which starts a cycle of inactivity resulting in loss of balance, muscle weakness, depression, sleep problems, and cardiovascular deficits. Thus promoting physical activity is essential, in

not only women with multiple sclerosis, but also the general population.

Stuifbergen and Roberts (2005) also surveyed health-promoting behaviors and quality of life in a convenience sample of 629 women with multiple sclerosis. In this sample, women also scored lower on the physical activity and spirituality subscale compared to other groups. The method of the study was descriptive correlational and the data collection was cross sectional. Health-promoting behaviors in this sample contributed to quality of life. Behaviors such as eating healthy, exercise, and stress management influence the response to physical deterioration associated with multiple sclerosis and other chronic disabling conditions.

Stuifbergen, Seraphine, Harrison and Adachi (2004) demonstrated that health-promoting behavior variables are similar in another chronic neurological condition, post-polio syndrome. This study had a descriptive correlational design and the sample was a large convenience sample of 2153 persons with post-polios syndrome. The path coefficient in the multiple sclerosis study and the post-polio study were almost equal in the samples (multiple sclerosis =0.17 and post-polio=0.19). The relationship implies health-promoting behaviors increase quality of life.

Harrison (1993) examined hope, perceived health status and health-promoting lifestyle in persons with HIV. An item of Pender's scale includes optimism, a dimension of health expression, which in this study Harrison identified optimism as hope. Harrison found a positive correlation between a health-promoting lifestyle and hope ( $r=.64$ ,  $p<.001$ ). Hope was entered into a hierarchal multiple regression of accounted for 41.4% of the variance. Hope had a strong correlation with self-actualization ( $r=.78$ ,  $p<.001$ ),

moderately high with interpersonal relationships ( $r=.78$ ,  $p.001$ ) and interpersonal support ( $r=.55$ ,  $p<.001$ ). Hope had a low correlation with stress management ( $r=.39$ ,  $p<.001$ ).

Self-efficacy has been associated with health-promoting behaviors for not only persons with chronic disabling conditions, but for all persons (Strecher, DeVellis, Becker, Rosenstock, 1986; Stuijbergen & Becker, 1994). Self-efficacy allows persons with Parkinson's disease to be resilient and is essential to cope with chronic illness (Nelson, Wong & Lai, 2011). Patients with a variety of chronic conditions were better able to manage their symptoms and utilize health care services when they had perceived high levels of self-efficacy (Lorig et al., 1999).

### **Summary of Health Promotion**

The literature described multiple definitions of health-promoting behaviors in persons in a variety of populations including cancer, HIV, and chronic neurological conditions such as polio, multiple sclerosis, and Parkinson's disease. These persons were described to have health-promoting behaviors related to their high level of hope (Bouchard, 1992; Fowler, 1997; & Harrison, 1993).

### **Summary of Gaps in the Literature**

The state of the science shows an association between Parkinson's disease and decreased HRQOL. The literature suggests that HRQOL decreases when non-motor symptoms increase disability (Leonardi et al., 2012; Post et al., 2011; Weintraub, Moberg, Duda, Katz, & Stern, 2004). The major non-motor symptom associated with decreased HRQOL is depression, which is a common factor in Parkinson's disease (Kadastik-Eerme et al., 2002). The literature also established an association between hope and quality of life. Herth (2000) noted that quality of life improves in cancer patients who

received a hope intervention. The literature describes hope as an essential component for improving quality of life in cancer patients (Rusteen, 1995; Herth, 1990, 2000). This connection has not been established in people with Parkinson's disease.

Limited research has been completed related to these variables in people with Parkinson's disease. Hope has been studied in healthy persons and persons with chronic illness, but not significantly in persons with Parkinson's disease. Fowler (1997) examined the relationship with hope and health-promoting behaviors in persons with Parkinson's disease and found a positive relationship between hope and health-promoting behaviors. The presence of all three concepts together is not evident in the literature and only Fowler's article was noted with two of the concepts, thus there is a need for more current research, which creates a need for more studies. These three concepts of hope, health-promoting behaviors, and health-related quality of life have not been studied in persons with Parkinson's disease. This is significant given that the Midwest has the highest prevalence of Parkinson's disease in the world. Expanded knowledge from this study will offer understanding into means to improve health-promoting behaviors, hope, and HRQOL for those with Parkinson's disease.

### **Theoretical Frameworks**

The conceptual framework for this study is based on Stuijbergen & Roger's (1997) *Explanatory Model for Health-Promotion within Chronic Conditions*. The model is well tested and incorporates concepts from Pender's (1987) Health-Promotion Model (HPM) and Bandura's Social Cognitive Theory (1986). The concepts from Pender and Bandura are the backbone for Stuijbergen's theory.

## Development of Explanatory Model of Health-Promoting Behaviors within Chronic Conditions

**Pender's Health Promotion Model.** Stuijbergen's *Explanatory Model of Health-Promoting Behaviors within Chronic Conditions* is based on the HPM, a theoretical framework describing relationships that contribute to a health-promoting lifestyle. Initially Pender (1987) developed the HPM as a framework that serves as a guide for predicting behaviors. The HPM is helpful in investigating different factors that influence a person's ability to perform health-promoting behaviors. Behaviors include self-actualization, health responsibility, physical activity, nutrition, spirituality, interpersonal support, and stress management (Pender, 1996).

Marriner- Tomey & Alligood (2010) describe the concepts of Pender's HPM as follows: Behaviors that relate to *prior behavior* have an influence on current health-promoting behaviors. *Personal factors* such as biological, psychological, and sociocultural factors also influence current health-promoting behaviors. The *perceived benefits* of action equal the benefits of getting on board with the health activities. *Perceived barrier* are problems like lack of money, which could delay health-promotion activities. *Perceived self-efficacy* is a strength to persevere and meet goals attributing to health promoting behaviors. *Activity related affect* is an interchange of activities not related to health-promotion activities. *Interpersonal influences* include different relationships that *Situational influences* prepare the individual for or steer them away from participating in health-promoting activities. *Commitment to a plan of action* summarizes steps to take health promotion tactics. *Immediate competing demands and preferences* include any part of the individual's life that interferes with accomplishing



health-promoting behaviors. Anything that causes a favorable health outcome is considered a *health-promoting behavior* (Marriner-Tomey & Alligood, p. 438-439, 2010).

**Social Cognitive Theory (SCT).** Self-efficacy undergirds Stuijbergen's model and was first introduced as a major assumption of Bandura's SCT. Bandura (1997) describes self-efficacy to be a person's belief about their abilities to control their own behavior and events affecting their lives. Self-efficacy plays a role in decreasing stress and improving coping through a person's self-appraisal of coping abilities necessary to deal with a stressful event (Bandura, 1989; Benight & Bandura, 2004). Self-efficacy is needed to maintain social and coping skills required for chronic disease management.

### **Explanatory Model of Health Promotion and Quality of Life in Chronic Disabling Conditions**

The Explanatory Model of Health-Promotion and Quality of Life in Chronic Disabling Conditions developed by Stuijbergen & Rogers (1997) has been validated twice, first in persons with multiple sclerosis and second in persons with post-polio syndrome (Stuijbergen, Seraphine & Roberts, 2000; Stuijbergen, Seraphine, Harrison, & Adachi, 2004). This model describes how disease severity has an effect on health-promoting behaviors and quality of life. Therefore, Stuijbergen's Model of Health-Promotion and Quality of Life in Chronic Disabling Conditions is a good fit for this study on health-promoting behaviors, hope, and HRQOL in persons with Parkinson's disease.

According to Stuijbergen and Roger's (1997) health promotion model, strategies need to be priority for serving persons with chronic disabling conditions. The authors describe health promotion fitting together with rehabilitation with a common goal of

improving quality of life. In order for persons with chronic disabling conditions to function at their full potential, they must engage in health-promoting behaviors.

Stuifbergen, Harrison, Becker and Carter (2004) verified health-promoting behaviors decrease the influence of disease severity on QOL. Their research recommends supporting health-promoting behaviors and self-efficacy to maintain and improve QOL. Combining health-promotion and self-efficacy is a powerful strategy for working with persons with chronic disease. The combination may lead to an improvement in health when persons meet health goals despite disease progression. Empowering persons with chronic diseases to use health-promoting behaviors is congruent with Pender's (2015) belief that health happens alongside the illness experience. Despite the limitations caused by Parkinson's disease in motor function or non-motor functions, the person still strives for good health.

The explanatory model describes how the concepts of perceived barriers, resources, and self-efficacy effect health-promoting behaviors (Meraviglia, Stuifbergen, Parsons, & Morgan, 2013). The model discusses how *severity of illness* could impair quality of life, but is remedied some by the mediating variables of *health-promoting behaviors* and the antecedent variables of *barriers, self-efficacy, resources, and acceptance* (Stuifbergen et al., 2004, p. 384).

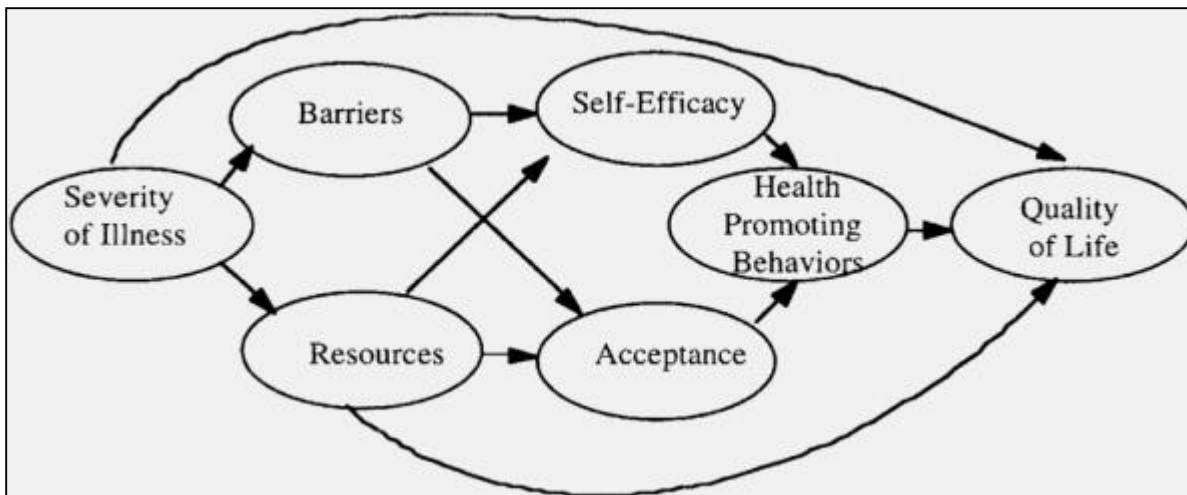


Figure 2. Explanatory model of health promotion and quality of life in chronic disabling conditions (Stuifbergen & Rogers, 1997) used with permission from author.

Stuifbergen et al. (2004) describe the Explanatory Model of Health Promotion and Quality of Life for Persons with Chronic Illnesses as follows: *severity of illness* impairs quality of life, but is reduced by *health-promoting behaviors* and the antecedent variables of *barriers*, *self-efficacy*, *resources*, and *acceptance* (p. 384). *Severity of illness* for Parkinson's disease patients increases as the disease reaches advanced stages. *Health-promoting behaviors* include physical activity, nutrition, and stress management (Stuifbergen et al., 2005). *Barriers* include problems with motor function, cognitive function, and pain leading to decreased HRQOL. *Self-efficacy* improves health-promoting behaviors and is a strength to persevere and meet goals (Marriner-Tomey & Alligood, 2010). *Resources* could link to finances, social support, and hope. *Acceptance* improves coping skills and thus improved quality of life. The concepts of the model are described in further detail below.

**Severity of Illness.** When severity of illness increases, barriers are expected to increase (Stuifbergen & Rogers, 1997). Severity of illness for Parkinson's disease patients would affect their activities of daily living, being ability to dress or bathe

themselves. Winter et al. (2010a, 2010b, 2011) discussed an average over 80% of patients with Parkinson's disease patients are dependent on cares mostly provided by family members. This high number of persons depend on others to help them with their ADLs because of their disease severity. Lou (2015) describes as severity of illness increases; fatigue severity also increases leading to decreased HRQOL. Fatigue is associated with several of the non-motor symptoms of Parkinson's including apathy, sleep disorders, cognitive dysfunction and depression.

**Barriers.** Problems with mobility, anxiety, depression, and pain are common problems decreasing HRQOL in persons with Parkinson's disease (Winter, 2011). These problems could classify as possible barriers using this model. Few studies have recognized the effect of depression in Parkinson's disease. The impact depression has on HRQOL is important to identify as depression is clearly associated with lower HRQOL and health-promoting behaviors (Dowding, Shenton & Salek, 2006; Jones, Pohar, & Patten, 2009; Schrag, 2006). Withdrawing from social life is another possible barrier that could result in lower HRQOL for persons with Parkinson's disease.

**Self-efficacy.** Research has indicated self-efficacy improves health-promoting behaviors for not only persons with chronic disabling conditions, but for all persons (Strecher et al., 1986; Stuijbergen & Becker, 1994). Self-efficacy allows persons with Parkinson's disease to be resilient and is essential to cope with chronic illness (Nelson, Wong & Lai, 2011). Patients with a variety of chronic conditions were better able to manage their symptoms and utilize health care services when they had perceived high levels of self-efficacy (Lorig et al., 1999).

**Resources.** Key resources noted in Stuijbergen's explanatory model are social

support and income. In Stuifbergen's study of persons with MS, emotional support was linked to health-promoting behaviors (Stuifbergen, 1995). For persons with Parkinson's disease key resources could also link to social support. Social support was studied related to coping and quality of life in Parkinson's disease and found symptoms of Parkinson's disease are correlated with social implications (Schreurs, De Ridder, & Bensing, 2000) For example, some of the symptoms of Parkinson's disease such as tremors, motor problems and apathy can lead to social isolation. Income is also a relevant resource for persons with Parkinson's disease because of high medical treatment costs. Typically, private insurance will not pay for approval of medical treatment such as deep brain stimulation (DBS). This expensive treatment works by implanting an electrode in the brain to inhibit abnormal nerve signals and is sometimes referred to as a brain pacemaker. This technique decreases tremors and improves abilities for persons to complete ADLs. Patients who have had DBS report significant improvement in symptoms and higher quality of life (Perestelo-Pérez et al., 2014).

**Acceptance.** The final approach used by persons with a range of chronic disabling conditions to foster health-promoting behaviors is acceptance (McWilliam, Stewart, Brown, Desai, & Coderre, 1996). The acceptance phase discusses how the disease fits into the person's lifestyle and does not equal giving up (Stuifbergen, Seraphine, Harrison & Adachi, 2005). In persons with Parkinson's disease acceptance helps the patient cope, which in turn coping leads to significantly improved HRQOL related to cognitive impairment, communication, and discomfort. Clinical interventions program such as acceptance and group mindfulness programs may benefit HRQOL in persons with Parkinson's disease (Bucks et al., 2011).

## Conclusion

The literature supports the occupational risks of farming and pesticides associated with Parkinson's disease (Kenborg et al., 2012; Kamel et al., 2007; Wright Willis et al., 2010). The increasing incidence of Parkinson's disease as the population ages is concerning for those at greater risk in farming communities in America. Parkinson's disease is associated with decreased HRQOL and studies show an increase in the Hoehn and Yahr stage of disease severity correlates with even worse quality of life (Goetz et al., 2004). On the contrary, the concept of hope is associated with an improvement in quality of life. Hope has been studied in a variety of populations including healthy populations, those with chronic diseases, and cancer (Dufault & Martocchio, 1985; Farran, et al., 1990; Forbes, 1994; Duggleby et al., 2010; Herth, 1989; Rustoen, 1995). Hope improves when a person received a hope intervention in persons with cancer, but no research has established this connection in people with Parkinson's disease.

HRQOL has been assessed in multiple populations including persons with Parkinson's disease (Sigstad et al., 2005; Leonardi et al., 2012; Miyashita et al., 2011; Post et al., 2011; Rodriguez- Violante et al., 2013; Visser et al., 2009; Weintraub, Moberg, Duda, Katz, & Stern, 2004; Welsch et al., 2003; Winter et al., 2010a, 2010b, 2011). An association of health-promoting behaviors and a strong HRQOL have been established in the literature (Stuifbergen, 1995; Stuifbergen & Rogers, 2005; Stuifbergen, et al., 2005). However, this specific association of health-promoting behaviors, HRQOL, and hope has not been established for people with Parkinson's disease which could have a significant impact given the high incidence of Parkinson's disease in the Midwest.

The theoretical model by Stuijbergen et al. (2004) is a good fit for this study because it describes quality of life for persons with chronic illnesses. The model has been validated twice, once in persons with polio and once in persons with multiple sclerosis. The health promoting behaviors measured in the model by Stuijbergen include physical activity, nutrition, and stress management. Other health-promoting behaviors not included in the model, but which will be measured in this study include health responsibility, spiritual growth, and interpersonal relationships. See Health Promoting Lifestyle Profile II Instrument (see Appendix C).

## CHAPTER 3: RESEARCH METHODOLOGY

### Introduction

This chapter examines the research design used to organize the study. Plans for sampling, instruments, data collection, and the data analysis in a systematic fashion are described. The protection of human subjects and ethical considerations are reviewed.

### Research Design

A descriptive correlational design was used to examine the relationships among health-promoting behaviors, hope, and HRQOL in persons with Parkinson's disease. Descriptive research paints a picture of characteristics and situations as they happen naturally in a single sample (Burns & Grove, 2011). A descriptive correlational design is appropriate as this study examines the relationship among the variables of health-promoting behaviors, hope, and quality of life portrays an image of life as it happens for persons with Parkinson's disease. According to Portney and Watkins (2009), a correlational design describes relationships among variables and is exploratory in nature. No attempt is made to control or manipulate the variables. Burns and Grove (2011) assert that correlational descriptive studies review circumstances in the past or in the present and can quickly identify many interrelationships in that situation. This type of design is also helpful to develop hypotheses for future studies. The role of a covariate in statistical data is to show the correlation among variables, directly or indirectly, without trying to establish a causal relationship

### Sample

According to Portney and Watkins (2009), the appropriate study sample size is important determining the power of the test. If the sample is small, then the data is not



likely an accurate portrayal of the population and increases the chance of an error. This type of error happens when the researcher accepts the data as true when it is false. This is a type II error, meaning that the researcher failed to discover the presence of the effect, which is a false negative. Having a smaller sample size is also harmful because it decreases the power of the test. Conversely, statistical power increases with a larger sample. Power links directly to the sample size and is a critical ability of a test to find if an effect truly exists (Field, 2014). A sample size of 176 was projected, using a power analysis based on an alpha of 0.05, power of 0.80 and Cohen's convention for a medium effect ( $r = 0.30$ ) (Polit & Beck, 2012) and a sample size of 179 was attained.

Participants were persons with Parkinson's disease attending support groups in the Midwest and attendees of the South Dakota 2016 Annual Parkinson's Awareness Conference. Participants were also from the Midwest Parkinson's Foundation mailing list. A convenience sample of persons with Parkinson's disease who met inclusion criteria for participation were included. This yielded a sample size of 179, which was over the minimum sample size of 176 participants. The exclusion criteria included persons with severe dementia or dysphasia, which impaired their ability to communicate.

The inclusion criteria for the study included English-speaking adults with Parkinson's disease. The population gave consent to participate by returning their survey. The study population included both males and females. Participants in nursing homes and assisted livings were also included in this study. Marital status was not an inclusion or exclusion criteria.

## Setting

The study utilized Parkinson's disease support groups located in a Midwestern state. Initially data were collected from three cities in a Midwestern state. One of the major cities, which is on the southeast side of the state, has a population of 168,586 (city-data.com, 2014). This community is the fastest growing metro area in this state (Businessweek, 2011). Over 80% of the population is Caucasian and 90.7% of the population has high school education (U.S. Census Bureau, 2014). The median age is 34.2 years (city-data.com, 2014). Another major support group is located in a city with a population of 23,225 and is on the eastern side of the state (city-data.com, 2014). The median resident's age is 22.7 years, which is perhaps lower because of a university located in the city. The third major city in this study has a population 22,057, which is also on the eastern side of the state. The median age is 36.4 years (city-data.com, 2014). All three cities have similar ethnicity and education percentages (U.S. Census Bureau, 2014).

Three additional support groups in different cities were added to the study to reach the sample size. A support group was added in a city on the western side of the state. This city has a population of 73,569 and 80% of the city is Caucasian. The high school graduation rate in this city is 91.7%. The second additional support group was in the southeastern part of the state. The city has a population of 22,702, and 92.5% of the population is Caucasian. Like the other cities, the high school graduation rate is greater than 90% (U.S. Census Bureau, 2015). The final city was in the eastern part of the state and had a population similar in size to two of the other cities with a population of 22,574; however, the high school graduation rate of this city was lower at 74.1% (U.S. Census

Bureau, 2015). Several surrounding communities came to this support group and this group had the highest attendance with 28 persons with Parkinson's disease.

Support groups in these cities met monthly and offer support for persons with Parkinson's disease, their caregivers, and friends. Support groups also provided education, socialization, opportunities to share worries or discuss new information on Parkinson's disease treatment. Support groups are free and open to anyone in the community (Parkinson's Association of South Dakota, 2016).

### **Instruments**

Participants completed four instruments. First, a demographic instrument collecting data on background information was used to describe the sample. Next, the Health Promoting Lifestyle Profile II (HPLP II), the Herth Hope Index (HHI) and the Parkinson's disease questionnaire-8 item version (PDQ-8), which measures HRQOL in Parkinson's disease patients were administered. Additionally, disease severity was assessed for each person based on the Hoehn and Yahr scale.

**Demographic Instrument for Background Information.** A demographic instrument for collecting background was developed for the study (see Appendix A). Basic demographic variables include age, gender, marital status, ethnicity, religious affiliation, and length of time since diagnosis. Munro (2005) describes nominal data as the lowest form of measurement because it limits the ability to control and perform statistical tests on the data.

**Hoehn and Yahr Scale.** Disease severity was assessed based on the Hoehn and Yahr scale (see Appendix B). Hoehn and Yahr (1967) developed a scale for practitioners to stage Parkinson's disease that is still commonly used today. The scale includes the

following five stages:

1. Unilateral or one-sided involvement.
2. Bilateral, which involves both sides and mild disease.
3. Bilateral disease with worsening balance and mild to moderate disease.
4. Severe disease, which requires extensive assistance.
5. Confinement to bed or wheelchair unless assisted and possible tracheostomy or feeding tube.

According to Bunting-Perry and Vernon (2007), the scale is not related to prognostic factor as the progression of the disease is so variable for patients, but rather a simple snapshot describing the persons' current rating of disease. Medication timing and dosing can change the outcome of the rating scale. Goetz et al., (2004) notes a lack of formal psychometric properties such as reliability and validity of the Hoehn and Yahr scale. The scale combines assessing disability and impairment. Because the scale is an ordinal scale, reliability testing is limited. The scale stage was self-reported by persons with Parkinson's disease. Overall, the scale has widespread use and is accepted by those in practice. In research, the scale is useful primarily in determining inclusion/exclusion criteria.

**Health Promoting Lifestyle Profile II Instrument Review.** The instrument chosen to measure health-promotion in this study was the Health Promoting Lifestyle Profile (HLPL) II instrument (Walker, Sechrist, & Pender, 1995) (see Appendix C). The psychometric properties of the scale include a strong internal consistency, Cronbach's alpha of .94 and with a test-retest reliability of .89 (Pender, 2011). The scale has 52 items with a 4-point scale assessing how often participants engage in health-promoting

behaviors. Six dimensions on the scale include health responsibility, nutrition, physical activity, spiritual growth, interpersonal relationships, and stress management. A factor analysis confirmed a six-dimensional structure of health-promoting behaviors. Content validity was obtained by literature review and the content experts' evaluation (Walker & Hill-Polerecky, 1996). Each of the dimensions is scored separately as a specific subscale and then together for a total score. Scores range from 1 (never) to 4 (routinely) and higher scores equal greater health-promoting behaviors. The scale takes an estimated 10 minutes to complete. Permission to use this tool was obtained from the author (N. Pender, personal communication, March 28, 2016).

**Hope Scale Instrument Review.** This study used the Herth Hope Index (HHI) to measure hope (see Appendix D). The HHI is a 12-item instrument for assessing hope in adults and was developed from the 30-item Herth Hope Scale (HHS). It is used to assess change related to how much an individual agrees with the statement at the moment of completing the instrument. The items are rated on a Likert scale from 1 (strongly disagree) to 4 (strongly agree) (Herth, 1992). The original hope scale items were created to reflect Dufault and Martocchio's (1985) concept of hope, which is the conceptual definition used in this study.

The HHI was validated through factor analysis and internal consistency in a convenience sample of 172 ill adults and has a Cronbach's alpha= 0.78-0.97 (Herth, 1992; 1993). Test-retest reliability of 0.91 also indicates high stability of this scale (Bluvol & Ford-Gilboe, 2004). The possible range of scores, once added together, range from 12 to 48 (Herth, 1992). The initial Cronbach's alpha was 0.94. The HHI pilot did not show a ceiling or floor effect in the item mean effect of the instrument (Herth, 1992).

Permission to use this tool was obtained from the author (K. Herth, personal communication March 16, 2013).

**Health-Related Quality of Life Instrument Review.** This study used the PDQ-8 to measure HRQOL (see Appendix E). The PDQ-8 is widely validated and represents a good instrument to measure HRQOL. The scale is also responsive to treatment effects and is easily administered (Fereshtehnejad et al., 2014). The construct validity was based on an exploratory factor analysis on evidence from eight measures representing the subscales that have established reliability, internal consistency Cronbach's alpha greater than 0.7, and test-retest reliability was established. In the PDQ-8, the lower scores predict higher HRQOL.

Multiple scales have been created to assess HRQOL in Parkinson's disease. The gold standard scale used most frequently to measure HRQOL in Parkinson's disease is the PDQ-39, which is the parent tool for the PDQ-8. The PDQ-8 has similar properties to the parent tool and was chosen instead of the PDQ-39 because of ease of administration and to prevent participant burden due to the large number of tools being used in this study.

The domains of the PDQ-8 represent a dimension from each of the following areas on the PDQ-39: "mobility, activities of daily living, emotional well-being, stigma, social support, cognition, communication and bodily discomfort," (Rodriguez-Violante et al., 2013, p.11). The tool is free for use for scientific purposes and requires less than 10 minutes to administer. The shorter tool has a single index figure and a smaller number of items. It has less participant burden and requires less time to administer than the 20 minutes of the PDQ-39.

The PDQ-8 has been validated in several countries including the USA, Canada, UK, Singapore, Greece, Italy, Spain, Persia, China, and Japan (Jenkinson & Fitzpatrick, 2007; Jenkinson, Fitzpatrick, Peto, Greenhall, & Hyman. 1997; Tan, Luo, Nazri, Li, & Thumboo, 2004). Permission was obtained from the author to use the instrument (C. Jenkinson, personal communication, March 8, 2013).

### **Data Collection**

**Human Subject's Protection.** Permission was obtained from the SDSU Human Subject committee. Participants were told the purpose of the study, the risks and benefits of the study, and nature of their contribution to the study. The participants were guaranteed confidentiality. A letter of consent was given to each participant and return of the surveys is considered their consent for participation. Confidentiality was upheld and all names of participants, addresses or any identifiers were removed.

**Subject Recruitment.** The participants were recruited from support groups in a Midwestern state. Average attendance at support group meeting is 20-40 persons. Each group meets at a set time on a monthly basis in either the afternoon or evening. Participants were also recruited at the South Dakota Annual Parkinson's Awareness Conference by a sign-up sheet for surveys to be mailed. The conference has an average attendance of 100 persons. The number of participants from the projected three support groups and conference did not meet the goal of the study; therefore, six additional support groups were visited to obtain an adequate sample size.

**Data Collection Process.** At nine different support groups, persons were invited to join the study. Prior to the meetings, support group leaders were contacted by email or phone for permission to administer the survey at the meetings. A presentation was given

at the support group meetings on nutrition at several of the meetings. The survey instruments were given to those at the support group meetings and a large manila envelope was placed in the back of the room for participants to return their survey once completed.

The other surveys were mailed to those not in attendance at the support groups with a return self-addressed stamp envelope (Appendix G). Dillman et al. (2014) was used as a guideline for the data collection process for these surveys. Dillman describes the importance of personalization and following up with participants using a five-contact method during implementation to ensure high response rates. The first step was to distribute letters explaining the study. These participants were mailed a reminder to complete the survey and then finally a thank you letter was mailed once the survey was completed and returned (see Appendix H).

Persons were also informed about the study at the South Dakota Annual Parkinson's Awareness Conference, where persons with Parkinson's disease were asked to sign up if they were interested in participating in the study. These participants were mailed a survey and received reminders to complete and return the survey. A thank you letter was mailed to them once the survey is complete.

### **Analysis**

Statistical analyses were conducted using IBM Statistical Package for the Social Sciences (SPSS 21.0). Statistical tests were used to measure the relationships between hope, health promoting factors, and health-related quality of life. The data from the survey responses were typed by hand and entries were double-checked by researcher after numbers were imported into SPSS.



Pearson's correlation coefficient was used to measure the strength of the relationship between the variables to quantify the relationship between hope, health-promoting factors and HRQOL. A significance level or alpha level of  $p < 0.05$  was used and a one tailed t- test was used to test if Pearson's correlations were significant. The following hypotheses were tested: 1) There is a positive relationship between hope and health-promoting behaviors, and 2) There is a positive relationship between health promoting-behaviors and hope on HRQOL. 3) Hope and health-promoting behaviors may predict HRQOL modifying for disease severity. The variables of hope, health-promoting behaviors, and HRQOL were measured in multiple regressions and a path analysis. According to Munro (2005), multiple regressions are used to predict outcomes. In this study, multiple regressions were used to identify statistical significant predictors of health-promoting factors and HRQOL. Multiple regressions tested the variances recognized as enablers and obstacles for hope and health-promoting behaviors.

A path analysis tests for the relationship between independent and dependent variables (Murnro, 2005). In this study, a path analysis determined the relationship between the independent or antecedent variables of hope, health-promoting behaviors and the dependent- outcome variables of HRQOL. Direct and indirect effects of confounding variables were evaluated.

Demographic data was analyzed using frequency numbers and percentages from participants. The background information sheet for demographics was collected. Relationships were reported between the background demographic data to hope and health-promoting behaviors using correlational matrixes. A t-test was used for exploring differences between the means (Polit & Beck, 2012) of the demographic variables.

variables will be studied by using non-parametric tests if the group size is not equal (Field, 2014).

### **Missing Values**

Missing values were assessed if they were occurring randomly or non-random. Less than five percent of a total missing values is considered ignorable and no pattern occurred (Hair et al., 2010). These authors also recommend deleting variables that are missing 15 percent of data. The Most Completely at Random (MCAR) test assessed if data were missing independently and no cases were identified as problematic in this sample. Assessing the missing data found no patterns were and 0.27% values were missing for overall data.

For this research, an imputation technique was used to replace missing data with the mean. According to Munro (2005), one process of imputation uses the mean replacement because this procedure does not change the distribution and is a conservative way to validate missing numbers to provide a complete data set.

### **Threats to Reliability and Validity**

Burns and Grove (2011) describe three ways to provide protection against threats to validity in a descriptive design study. First links need to be present for conceptual and operational definitions of variables. In this study, the conceptual definition of hope by Dufaut and Martocchio (1985) was operationalized in the questions of the HHI tool. The other definitions and tools are connected. The second way to protect against bias relates to sample selection and size.

The sample selection and size may be skewed compared to the general population of patients with Parkinson's disease because the sample is selected in the Parkinson's

disease belt where patients have higher prevalence and incidence of the disease. In addition, the sample may have more ethnically similar individuals who are genetically susceptible to Parkinson's disease residing in this geographic area of the study. The final way to protect from bias is to use valid and reliable instruments for data collection procedures. This study's instruments have solid validity and reliability.

### **Summary**

This study examines the relationship of health-promoting behaviors, hope, and HRQOL for persons with Parkinson's disease. Additionally, hope and health promoting behaviors may help ease the burden of the disease and possibly lead to a positive effect on quality of life. The study methods, procedures, and instruments are reviewed.

## CHAPTER 4: RESULTS AND ANALYSIS

### Introduction

This chapter presents the results of the research and describes the demographics of the sample, variable testing, and results of test validity and reliability. The data were collected in surveys and responses entered by hand into an Excel spreadsheet and double-checked by researcher. Then the data were imported into the IBM Statistical Package for the Social Sciences (SPSS) version 22 for statistical analysis. The purpose of this study was to determine the relationship between hope, health-promoting behaviors, and HRQOL in persons with Parkinson's disease. A statistician was consulted for the review of results and analysis.

This study was designed to answer specific research questions. The results from the first research question analyzed the level of hope in persons with Parkinson's disease. The findings from the second question described the relationship between hope and health-promoting behaviors on HRQOL in persons with Parkinson's disease. The results from the final question examined the relationship among hope, health-promoting behaviors, and HRQOL, while controlling for disease severity.

### Sample Characteristics

A convenience sample was selected of participants from Parkinson's disease support groups and the South Dakota Parkinson's Awareness Conference. The survey was completed by persons with Parkinson's disease at nine support groups in a Midwest state between July and December 2016. The groups ranged from seven to 34 attendees per meeting. One person attending the support group had another neurologic disease other than Parkinson's disease, and that survey was excluded. Eight surveys were

excluded due to incomplete survey tools. There were 149 surveys returned from support groups and South Dakota Parkinson's Awareness Conference, which accounted for 83% of the total participants.

Additional participants from a mailing list from the Midwest Parkinson's Foundation received a pre-notice letter (n=100) introducing the study. Those participants received the survey by mail and 30 returned the survey, a return rate of 30%. The 30 mailed surveys account for 17% of the total sample. Their primary care provider or a neurologist had told all participants they had Parkinson's disease.

### **Results and Analysis**

**Setting.** The persons in the support groups and at the conference were handed the pre-notice letter to participate in the study. Next, they were given the cover letter, which stated informed consent if the survey was returned. Lastly, they were given the packet of surveys with the Herth Hope Index, HPLP-II, PDQ-8 questionnaires, and a self-addressed stamped return envelope.

Participants from the mailing list were mailed the pre-notice letter to participate in the study. Then they were mailed the cover letter, which stated informed consent if the survey was returned. Finally, the packet of surveys with the Herth Hope Index, HPLP-II, PDQ-8 questionnaires, and a self-addressed stamped return envelope was mailed. Participants were requested to return the questionnaires in the self-addressed stamped return envelope. These participants were also mailed a letter two weeks after the survey was mailed, thanking them if they had already completed the survey and reminding them to complete the survey if they had not already done so. Total surveys were distributed to 250 persons.

**Demographic Data.** The demographic variables collected were age, gender, marital status, ethnicity, time (in years) since the diagnosis, and whether the participant grew up on a farm. The antecedent variables or independent variables were hope, health-promoting behaviors, and disease severity. The outcome variable or dependent variable was HRQOL. Descriptive statistics were performed on demographic characteristics.

**Demographic Results.** Persons with Parkinson's disease (N =179) completed the survey. Persons with Parkinson's disease who completed the survey were almost exclusively Caucasian. Participants were predominantly male, 60.9%. The age ranged from 37 to 96, and the majority of participants were between 66 and 75. Most participants surveyed had been diagnosed between one to five years prior. Fewer than half of the participants, 45.3%, had grown up on a farm or in a rural area.

**Age.** Fifty-three percent were diagnosed with Parkinson's disease between one to five years prior. The mean age of the study sample participant was 73 years. The median age of the study participants was 74 (see Table 1). The mean age for persons in the United States with Parkinson's disease is unknown. According to the Parkinson's Disease Foundation, the national average of diagnosis is 60 years. The participants in this study were generally diagnosed with Parkinson's disease later in life than the national average age of diagnosis of 60 years (PDF, 2016).

Table 1

<i>Age of Study Participants</i>		
<u>Age</u>	<u>Participants</u>	<u>Percent</u>
<55	7	3.9
56–60	6	3.3
61–65	19	10.6
66–70	37	20.7
71–75	41	22.9
76–80	28	15.6
81–85	28	15.6
>85	13	7.4

**Gender.** According to national data from the Parkinson’s Disease Foundation (2016), males are 1.5 times more likely to have Parkinson’s disease than females. Participants in this study were 60.9% male and 39.1% female. This study aligned with the Parkinson’s Disease Foundation data, with 1.6 times more males than females (see Table 2).

Table 2

<i>Gender of Study Participants</i>		
<u>Gender</u>	<u>Participants</u>	<u>Percent</u>
Male	109	60.9
Female	70	39.1

**Ethnicity.** Study participants were 98.3% Caucasian, 1.1% Hispanic, and 0.6% Japanese (see Table 3). To date, very few studies have collected data on ethnicity. Research is not conclusive if disease varies by ethnicity. Most studies reviewed included Caucasian. Some studies noted by Kaiser Permanente Research (1994–1995) showed that African Americas and Asians were at less risk to develop Parkinson’s disease; however,

Parkinson's disease affects people from all ethnicities and backgrounds, regardless of social economic status or geography (Van Den Eden et al., 2003).

Table 3

*Ethnicity of Study Participants*

<u>Ethnicity</u>	<u>Participants</u>	<u>Percent</u>
White/Caucasian	176	98.3
Hispanic	2	1.1
Japanese	1	0.6

**Relationship Status.** The majority of participants, 78.2%, were married, and 11.7% were widowed. The remaining 11.1% were divorced, single, separated, or in relationships but not married (see Table 4).

Table 4

*Marital Status of Study Participants*

<u>Marital Status</u>	<u>Participants</u>	<u>Percent</u>
Divorced	9	5.0
In relationship, not married	2	1.1
Married	140	78.2
Separated	1	0.6
Single, never married	6	3.4
Widowed	21	11.7

**Length of Time Since Diagnosis.** The mean number of years since diagnosis was 7.11 years. The median number of years was five years. The majority (82%) of the persons in the support groups were diagnosed within the last 10 years, 53% were diagnosed between one and five years and 29% between six and 10 years (see Table 5).



Table 5

<i>Number of Years since Diagnosis</i>		
<u>Diagnosis in years</u>	<u>Participants</u>	<u>Percent</u>
1-5	95	53%
6-10	51	29%
11-15	15	8%
16-20	9	5%
>20	9	5%

**Time on Farm.** Over half of the participants did not have a farming background. Eighty-one participants, or 45.3% of the sample, grew up on a farm (see Table 6). Previous research found pesticides from agriculture increases the risk for Parkinson's disease (Gatto et al., 2009; Marder et al., 1998; Morano et al., 1994; Smargiassi et al., 1998; Wang et al., 1993; Wechsler et al., 1991; Wong et al., 1991). Possibly, the number of persons in attendance at the support group was lower for those associated with agriculture because it was during harvest.

Table 6

<i>Participants Who Grew Up on a Farm</i>		
<u>Farming background</u>	<u>Participants</u>	<u>Percent</u>
Yes	81	45.3
No	97	54.2

**Analysis of Demographics.** Demographic comparison to statistics for persons with Parkinson's disease was challenging because the United States is lacking a current accurate reporting system. The scarcity of data on the incidence of Parkinson's disease is likely to improve because on December 13, 2016, President Obama signed the Cures Act into law. This will allow the Centers for Disease Control and Prevention (CDC) to collect demographics on sex, age, ethnicity, and geographic distributions of Parkinson's disease and other neurologic diseases in the US. The new reporting system, National Neurological Conditions Surveillance System at the CDC, will help increase

understanding of demographics and strengthen future research when implemented (Falce, 2016).

**Summary of Demographic Data Analysis.** Demographic standards for comparison were difficult to attain due to lack of national reporting system. The data collected by the PDF shows that for the support groups in this study the baseline for diagnosis is at a higher age than the national average of diagnosis of 60. This may be related to lack of providers that are specialists in the state for neuromuscular disorders, or there may be a delay in seeking treatment with early signs of Parkinson's disease. Education on signs and symptoms for persons to report to a doctor and better screening by providers is needed to improve diagnosis. Delayed onset of disease could also be a possibility. The study's data on gender for men being more likely than women was almost identical. The ethnicity was predominantly Caucasian at 98%. This aligns with data from the Parkinson's disease foundation and from a study by Kaiser Permanente that found that the majority of the incidence for Parkinson's disease is Caucasian (13.5 per 100,000) (PDF, 2016; Van Den Eeden et al., 2003).

The length of time since diagnosis correlated with a high number of persons who were recently diagnosed, suggesting it is more common to seek out social support during the first 10 years from the time of diagnosis. Those attending the support groups did not have a strong correlation with growing up on the farm, even though studies have noted the risk of farming is associated with Parkinson's disease and associated chemicals (Kenborg et al., 2012; Wright Willis et al., 2010). In this study, less than half of participants grew up on a farm. This may be explained because those farming possibly are less likely to attend support groups. Additionally, persons with Parkinson's disease

who are still farming may have been too busy to attend the support groups in the fall, as data were collected during harvest time.

### **Analysis of Multivariate Methods**

Three multivariate methods were used in the analysis. The first method completed was the exploratory factor analysis (EFA), which extracts factors or dimensions from a large set of variables. Next, a confirmatory factor analysis (CFA) was used to determine and measure the goodness of fit of the factor structure for the sample data (Hair, Black, Babin, & Anderson, 2010). Finally, a path analysis was completed using AMOS 19.0 to measure the relationship between dependence, independent, and moderator variables (Munro, 2005). Tests were completed to analyze the assumptions of the path analysis.

### **Factor Analysis**

Exploratory factor analysis (EFA) clarifies how the observed items and latent variables are related to one another (Byrne, 2010). Using the EFA process, underlying factors or dimension among the selected input variables were extracted in the analysis. These dimensions were assumed to represent factors that are highly inter-correlated among the large variable set of survey items.

Prior to running the factor analysis, the EFA assumptions were considered appropriate for use of the model. EFA assumptions or requirements includes sample size considerations, intercorrelation of the input variables, measure of sampling adequacy, total variance explained, average factor loading, measure of reliability, convergent and discriminate validity (Hair et al., 2010; Williams, 2012). According to Tinsley & Brown (2000), if these assumptions are not met, the power will be reduced and the chance of a Type 1 error is greatly increased. The recommended sample size should be 100 or larger

for factor analysis (Hair et al, 2010; Field, 2014). This study's sample size,  $n = 179$ , is appropriate for an EFA design.

Factor rotation used in the study was an oblique rotation using Promax rotation. According to Portney & Watkins (2009) oblique rotation is easy to interpret and conceptually simple. Eigenvalues represented the amount of variance that belonged to a factor and was a statistic used as a cutoff point to limit the number of factors in the analysis. Only factors having eigenvalues greater than one are considered significant and values less than one are disregarded (Portney & Watkin, 2009). Finally, the scree-plot and factor loadings (correlations between the original variables and the factors) were examined using criteria of  $\pm 0.30$  threshold established by Hair et al (2010). Correlation coefficients over  $\pm 0.30$  are good indicators of factorability (Tabachnick & Fidell, 2007).

Hair et al. (2010) describes EFA as a process that identifies representative variables from a much larger set of variables for use in subsequent multivariate analyses. EFA was completed in this analysis to help explain how the observed number of survey items related, 52 items on the HPLP-II scale, 8 items on the HRQOL scale, and 12 items on the hope scale, which equaled 72 total input variables. This large number of variables excluded the demographic profile questions.

### **Extracted Factors**

The results of factor analysis extraction method identified seven dimensions: spiritual growth, HRQOL, health responsibility, physical activity, nutrition, and the combination of hope and HRQOL. A total of seven dimensions with eigenvalues greater than 1.0 were identified (see Table 7). This explains 55% of the cumulative variance of

the extracted factors from the data, which is well above the threshold for cutoff suggested by Hair et al. (2010). Examining the scree plot (see Figure 3) identified seven extracted factors, the line of the inflection point separates seven significant eigenvalues greater than 1.0 from eigenvalues (below 1.0) that are not significant. Out of the 72 input variables selected for factor extraction, 42 input variables showed adequate factor loads to their respective factors. Average commonality (common variance) across the factors was .549, (see Table 8) which was higher than the .30 threshold established by Hair et al., (2010).

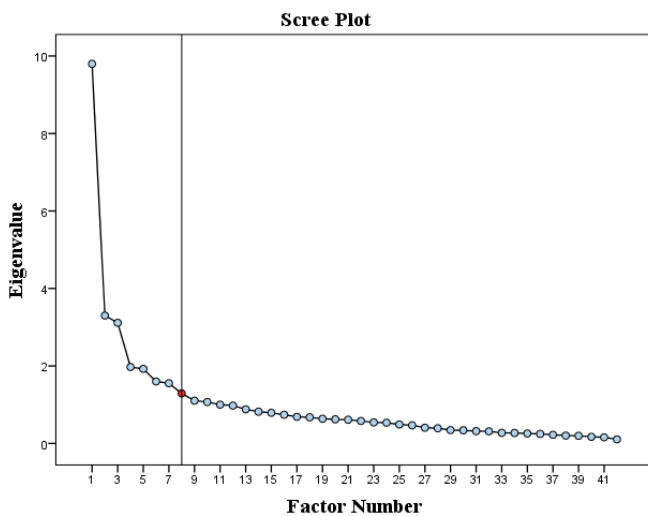


Figure 3. Scree plot.

Table 7

*Total Variance Explained*

Extracted Factors	Initial Eigenvalues			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total
Spiritual Growth (SG)	9.798	23.328	23.328	8.050
Quality of Life (QOL)	3.300	7.858	31.185	4.172
HOPE	3.114	7.415	38.601	5.949
Health Responsibility (HR)	1.972	4.696	43.297	3.897
Physical Activity (PA)	1.924	4.580	47.877	3.509
Nutrition	1.600	3.810	51.687	3.024
HOPE/QOL	1.554	3.699	55.386	2.808

Table 8

*Communalities of Factor Loadings*

Factor	Communality	Factor	Communality
HPLP18	0.757	RevQOL2	0.599
HPLP24	0.741	RevQOL5	0.609
HPLP12	0.649	RevQOL5	0.624
HPLP17	0.578	RevQOL8	0.495
HPLP23	0.543	RevQOL3	0.594
HPLP36	0.621	<i>Average</i>	
HPLP30	0.575	<i>Communalities</i>	0.549
HPLP6	0.504		
HPLP19	0.588		
HPLP35	0.559		
HPLP39	0.579		
HPLP27	0.489		
HPLP15	0.480		
HPLP31	0.543		
HPLP51	0.478		
HPLP43	0.430		
HPLP10	0.645		
HPLP4	0.638		
HPLP28	0.553		
HPLP16	0.428		
HPLP46	0.416		
HPLP2	0.519		
HPLP8	0.483		
HPLP26	0.468		
HPLP44	0.463		
HPLP9	0.402		
HPLP20	0.540		
HOPE3	0.487		
HOPE6	0.352		
HOPE7	0.518		
HOPE8	0.600		
HOPE9	0.569		
HOPE11	0.735		
HOPE12	0.754		
RevQOL7	0.362		
RevQOL4	0.493		
RevQOL1	0.606		

## Factor Loadings

According to Hair et al. (2010), factor loadings are the correlation of the input variables within each extracted factor. Hair et al. established factor loading criteria with ranges from  $\pm.30$  to  $\pm.40$  to meet the minimal level for interpretation of structures (factors) and loadings  $\pm.50$  or greater are considered *practically significant*. Six of the seven extracted factors have average factor loadings greater than 0.50, which verifies the significance of the factor loadings within each of the structures (factors/dimensions) from the data set and one extracted factor in the combination of Hope/HRQOL had average loading less than the standard threshold. The hope/HRQOL combination dimension had an average factor loading = 0.419 (see Table 9).

Factor loading of each input variable to their respective factor or dimensions were measured. The spiritual growth dimension had an average factor loading = 0.81. HRQOL dimension had an average factor loading = 0.626. The hope factor had an average factor loading = 0.672. Health responsibility dimension had an average factor loading = 0.559. Nutrition dimension had an average factor loading = 0.538.

In terms of the average loadings at the scale level, HPLP had an average factor loading = 0.598. Hope had an average factor loading = 0.672. HRQOL had an average factor loading = 0.522. All reached the threshold of 0.50 and so are considered significant.



Table 9

*Pattern Matrix: Dimension level*

	Factor						
	Spiritual Growth	Quality of Life	Hope	Health Responsibility	Physical Activity	Nutrition	Hope/QOL
Cronbach's Alpha	(0.890)	(0.784)	(0.846)	(0.770)	(0.788)	(0.735)	(0.670)
HPLP24	0.819						
HPLP18	0.749						
HPLP23	0.731						
HPLP35	0.674						
HPLP30	0.663						
HPLP12	0.625						
HPLP36	0.552						
HPLP17	0.541						
HPLP6	0.520						
HPLP19	0.406						
<b>Average Factor Loadings:</b>	<b>0.628</b>						
RevQOL5		0.696					
RevQOL1		0.681					
RevQOL2		0.667					
RevQOL6		0.655					
RevQOL8		0.429					
<b>Average Factor Loadings:</b>		<b>0.626</b>					
HOPE11			0.831				
HOPE12			0.701				
HOPE7			0.678				
HOPE9			0.586				
HOPE8			0.564				
<b>Average Factor Loadings:</b>			<b>0.672</b>				
HPLP39				0.772			
HPLP27				0.625			
HPLP15				0.578			
HPLP51				0.492			
HPLP31				0.475			
HPLP43				0.413			
<b>Average Factor Loadings:</b>				<b>0.559</b>			
HPLP4					0.851		
HPLP10					0.847		
HPLP28					0.697		
HPLP16					0.491		
HPLP46					0.390		
<b>Average Factor Loadings:</b>					<b>0.655</b>		
HPLP8						0.724	
HPLP2						0.721	
HPLP26						0.473	
HPLP44						0.464	
HPLP9						0.453	
HPLP20						0.394	
<b>Average Factor Loadings:</b>						<b>0.538</b>	
HOPE3							0.526
RevQOL7							0.407
RevQOL3							0.406
RevQOL4							0.396
HOPE6							0.358
<b>Average Factor Loadings:</b>							<b>0.419</b>

Extraction Method: Maximum Likelihood.

Rotation Method: Promax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 7 iterations.

The Goodness of Fit test concerning the terms of model fit of the extracted factor model (EFA) is found in Table 8. According to Hair et al. (2010), the measure of model fit using *Chi-Square/Df* of less than 3.0 is a sign of adequate fit. The study's *Chi-Square/Df* = 1.43 indicated a parsimonious fit of the model at the EFA stage (see Table 10).

Table 10

*Goodness-of-Fit Test*

<u>Chi-Square</u>	<u>df</u>	<u>Chi-Square/Df</u>
843.278	588	1.43*

\*Model Fit Threshold= <3

### **Validation of the Extracted Factors**

According to Portney and Watkins (2009), there are three steps to consider for the validation process of extracted factors. The first is to consider the discriminate validity, which analyzes whether the factors are distinct and uncorrelated. The second step evaluates the convergent validity, which assesses the degree to which two or more measures of the same concept are correlated. The final step checks the inter-item reliability, or the extent to which a variable or set of variables is consistent in what it is intended to measure.

**Discriminant Validity.** The Factor Correlation Matrix (see Table 11) displays the correlation coefficients between the seven factors to test for discriminant validity. The table presents the relative measure of the strength of the relationship between the five extracted factors. Validation of the extracted factors should not be greater than the correlation coefficient of  $\pm 0.70$  (Gaskin, 2012) to have discriminate validity. This

assumption of a correlation coefficient less than 0.70 relates to the issues with severe high correlation between two factors, which indicates that those factors' individual contributions are reduced. Variables need to be distinct and uncorrelated to have validity. No bivariate correlation coefficient greater than 0.70 was shown after the inspection of the factor correlation matrix, which indicates that each of the extracted factors are distinct and this study shows discriminant validity was achieved.

Table 11

*Factor Correlation Matrix*

Factor	SG	QOL	HOPE	HR	PA	Nutrition	HOPE/QOL
SG	1	0.422	0.599	0.345	0.272	0.242	0.333
QOL	0.422	1	0.197	0.085	0.268	0.144	0.128
HOPE	0.599	0.197	1	0.402	0.239	0.165	0.230
HR	0.345	0.085	0.402	1	0.189	0.232	0.062
PA	0.272	0.268	0.239	0.189	1	0.343	-0.076
Nutrition	0.242	0.144	0.165	0.232	0.343	1	-0.030
HOPE/QOL	0.333	0.128	0.230	0.062	-0.076	-0.030	1

Similarly, bivariate correlations (see Table 12) between the three scales have shown no bivariate correlation greater than 0.70. Therefore, each of the three scales are distinct. This confirms that discriminant validity was achieved at the higher order.

Table 12

*Correlation Matrix between the 3 Scales*

		HPLP	HOPE	QOL
HPLP	Pearson Correlation	1	.549**	.458**
	Sig. (2-tailed)		0.000	0.000
	N	179	179	179
HOPE	Pearson Correlation	.549**	1	.308**
	Sig. (2-tailed)	0.000		0.000
	N	179	179	179
QOL	Pearson Correlation	.458**	.308**	1
	Sig. (2-tailed)	0.00	0.00	
	N	179	179	179

**Convergent Validity.** According to Hair et al. (2010), the threshold for loadings should be greater than 0.5 to have sufficient loading, regardless of sample size. Average factor loadings for each of the two factors were greater than 0.50. Upon examination of Tables 9 and 10, six of the seven extracted factors have adequate factor loadings greater than expected threshold except the Hope/HRQOL combination. Overall, the indicator variables converged well together with their respective factors and convergent validity was achieved.

**Inter-Item Reliability.** In exploratory research, Cronbach's Alpha value above .70 is a good measure of inter-item level consistency (Hair et al., 2010). The inter-item reliability tests whether the extent variables or sets of variables are consistent in what it is intended to measure. This is different from validity of the extracted factors because it

does not relate to what should be measured, but rather instead to how it is measured (Hair et al., 2010).

Another measure of reliability is internal consistency. This applies to the consistency among the variables in a summated scale. Internal consistency describes how the individual items or indicators of the scale should all be measuring the same construct and thus be highly inter-correlated (Byrne, 2010; Tinsley & Brown, 2000).

The spiritual growth factor's internal consistency was,  $\alpha = .890$ . The HRQOL factor's internal consistency was,  $\alpha = .784$ . The hope factor's internal consistency was,  $\alpha = .846$ . The health responsibility factor's internal consistency was,  $\alpha = .770$ . The physical activity factor's internal consistency was,  $\alpha = .788$ . The nutrition factor's internal consistency was,  $\alpha = .735$ . The hope/HRQOL combination factor's internal consistency was,  $\alpha = .670$ . This indicates that the individual items within each dimensions achieved a good level of internal consistency, and therefore achieved inter-item consistency.

**Confirmatory Factor Analysis (CFA).** According to Field (2014), the CFA is an important step to test hypotheses and the relationships between the latent variables. This is important because these latent variables are related to variables that can be measured, but cannot be measured directly. Hair et al. (2010) describes three assumptions that need to be met for the CFA process. First, significance of the indicator variables to their respective factors or dimension must be established. Then model fit of the factor model. Lastly, reliability of the factor model is tested.

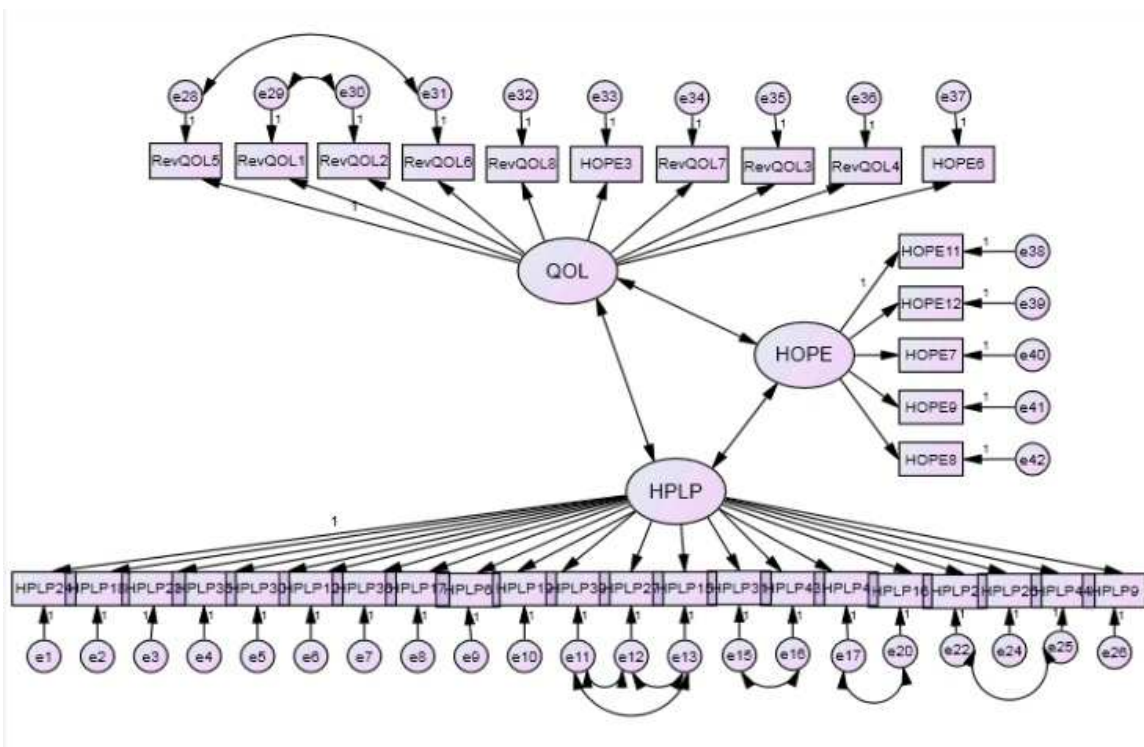


Figure 4. Confirmatory factor model diagram.

Figure 4 is the diagram of the final confirmatory factor structure model. To achieve adequate model fit, modification indices (covariance of the error terms) offer remedies to discrepancies between the proposed and the estimated model and modification index value. Greater than 15.0 is a good indicator to covary the error terms of the same factor to improve model fit (Gaskin, 2012).

Several error terms existed in the model. Each covaried terms have similar item structure and thus covarying their error terms was appropriate to improve goodness of fit. Additionally, six HPLP items (HPLP 8, 28, 20, 46, 10, and 51) were dropped because of their large residual errors between the proposed and estimated CFA model.

Covariation existed between the items listed below:

1. HPLP item 15 “Question health professionals in order to understand their instructions” and HPLP item 39 “Ask for information from health professionals about how to take good care.”
2. HPLP item 27 “Discuss my health concerns with health professionals” and HPLP item 39 “Ask for information from health professionals about how to take good care” also showed covariance.
3. HPLP item 15 “Question health professionals in order to understand their instructions” and HPLP item 27 “Discuss my health concerns with health professionals.”
4. HPLP item 31 “Touch and am touched by people I care about” and HPLP item 43 “Get support from a network of caring people.”
5. HPLP item 4 “Follow a planned exercise program” and HPLP item 16 “Take part in light to moderate physical activity.”
6. HPLP item 2 “Choose a diet low in fat, saturated fat, and cholesterol” and HPLP item 44 “Read labels to identify nutrients, fats, and sodium content in package food.”
7. HRQOL item 5 “Had problems with concentration” and HRQOL item 6 “Felt unable to communicate with people properly.”
8. HRQOL item 1 “Had difficulty getting around in public” and QOL item 2 “Had difficulty dressing myself.”

Table 13

*Regression Weights: CFA*

			Estimate	S.E.	C.R.	P
HPLP9	<---	HPLP	0.330	0.086	3.829	***
HPLP44	<---	HPLP	0.287	0.123	2.33	*
HPLP26	<---	HPLP	0.298	0.095	3.154	**
HPLP2	<---	HPLP	0.223	0.101	2.214	*
HPLP16	<---	HPLP	0.337	0.108	3.123	**
HPLP4	<---	HPLP	0.236	0.119	1.979	*
HPLP43	<---	HPLP	0.342	0.097	3.529	***
HPLP31	<---	HPLP	0.544	0.086	6.32	***
HPLP15	<---	HPLP	0.321	0.105	3.057	**
HPLP27	<---	HPLP	0.307	0.097	3.168	**
HPLP39	<---	HPLP	0.472	0.103	4.597	***
HPLP19	<---	HPLP	0.731	0.089	8.188	***
HPLP6	<---	HPLP	0.782	0.098	7.981	***
HPLP17	<---	HPLP	0.642	0.081	7.955	***
HPLP36	<---	HPLP	0.858	0.089	9.683	***
HPLP12	<---	HPLP	1.009	0.095	10.568	***
HPLP30	<---	HPLP	0.959	0.106	9.089	***
HPLP35	<---	HPLP	0.848	0.099	8.556	***
HPLP23	<---	HPLP	0.837	0.098	8.567	***
HPLP18	<---	HPLP	1.101	0.095	11.617	***
HPLP24	<---	HPLP	1 (Fixed parameter)	~	~	~
RevQOL5	<---	QOL	1 (Fixed parameter)	~	~	~
RevQOL1	<---	QOL	1.118	0.23	4.861	***
RevQOL2	<---	QOL	0.958	0.215	4.448	***
RevQOL6	<---	QOL	1.033	0.144	7.152	***
RevQOL8	<---	QOL	1.003	0.203	4.931	***
HOPE3	<---	QOL	0.756	0.155	4.894	***
RevQOL7	<---	QOL	0.863	0.204	4.237	***
RevQOL3	<---	QOL	1.324	0.223	5.935	***
RevQOL4	<---	QOL	0.92	0.173	5.332	***
HOPE6	<---	QOL	0.628	0.147	4.27	***
HOPE11	<---	HOPE	1 (Fixed parameter)	~	~	~
HOPE12	<---	HOPE	1.156	0.083	13.899	***
HOPE7	<---	HOPE	0.589	0.073	8.043	***
HOPE9	<---	HOPE	0.711	0.083	8.541	***
HOPE8	<---	HOPE	0.844	0.085	9.889	***

\*\*\*p &lt;.001, \*\* p&lt;.01, \*p&lt;.05



Regression weights (see Table 13) for each of the indicator variables were manifested by their respective factors. Three fixed parameters (not estimated) were needed to find model convergence or model solution of the maximum likelihood algorithm. Each of the regression weights were statistically significant. This confirms that the model structure proposed by the study is satisfactory. Table 14 describes measures of model fit, using Hu and Bentler (1999) conventions of goodness-of-fit indices. This three-factor model structure achieved adequate and reasonable model fit. The extracted factors provided the study with a robust factor model, which was used in the study's hypothesis-testing stage. The construct reliability of the confirmed factor structure model is shown to have an adequate inter-item consistency greater than the standard threshold value of 0.70, QOL = .792, HPLP = .857, and hope = .844 (see Table 15).

Table 14

*Model Fit Indices*

	Acceptable Thresholds	Observed Model Fit
CMIN/DF	Between 2-5*	1.74
CFI	> .95 great; > .90 traditional; > .80 permissible *	0.82
RMR	< .07*	0.06
RMSEA	< .05 good; .05 - .10 moderate; > .10 bad*	0.07

\*Hu and Bentler (1999)

Table 15

Construct Reliability

QOL 0.792

HPLP 0.857

HOPE 0.844

Threshold= &gt;0.70

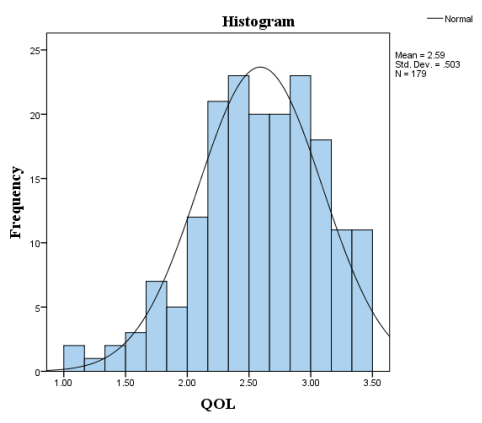
After meeting the assessment of the reliability test, convergent validity, discriminant validity, and confirmation of model fit of the factor model, a summated scale or a composite variable was created. This scale combined each of the survey items or indicator variables to their respective factors to facilitate the statistical calculation of the hypothesized path models. The three composite variables were used to test for the five assumptions of the multivariate regression method to assess for appropriateness of method used.

**Path Analysis (Multivariate Regression) Assumptions**

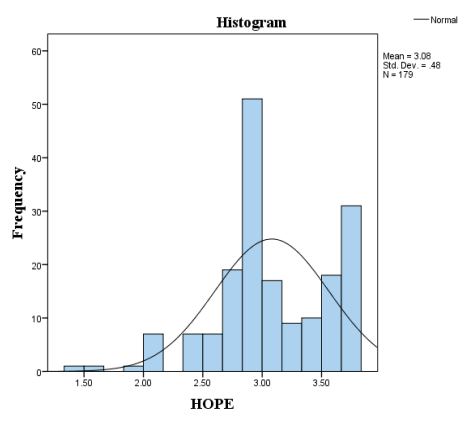
The first assumption tested if normal distribution existed among the input variables. Next, the assumption was tested to see if the model was unidirectional, having a linear relationship between the dependent and independent variables. Multicollinearity was also tested in order to determine whether extreme correlations between independent variables were present. Assumptions of homogeneity/homoscedasticity were then evaluated to assess if the residual variances of Y (outcome) were equally the same for the level of X (predictors). Finally, independent of errors or residual terms were tested (Hair et al., 2010; Munro, 2005).

**Normality.** The first assumption examined whether the input variables estimated normal distribution visually. Pictures of histograms and boxplots determined influential outliers. Shapiro-Wilk's test of normality is a conservative test for normal distribution. The test was conducted to approximate normality and observe skewness and kurtosis values against an accepted threshold value (Field, 2014).

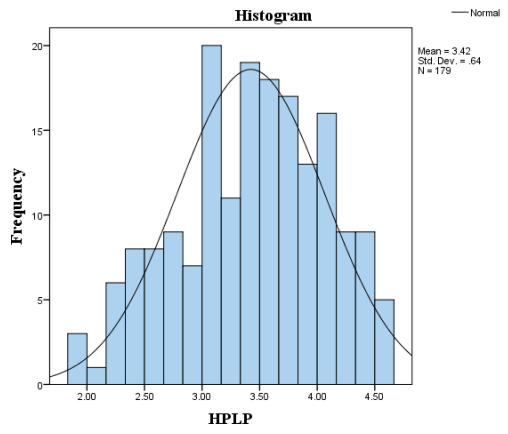
Figure 5 displays the histograms with the fitted normal curve. Examination of the histogram graph for dependent variable, HRQOL, shows the spread of the distribution has an asymmetric shape with a slight negative or left-skewed distribution, or left tail. Similarly, the predictor variable hope displays an asymmetric distribution with a slight negative or left skewed as evidence of the extended left tail. Lastly, the independent variable HPLP appears to depict a symmetric distribution with equal lengths of the right and left tails of the curve.



i. QOL



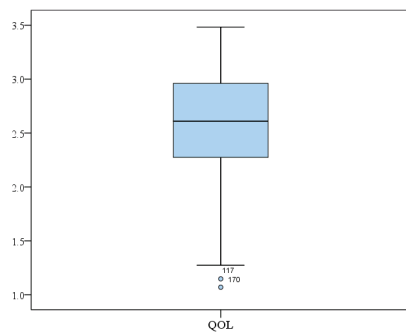
ii. HOPE



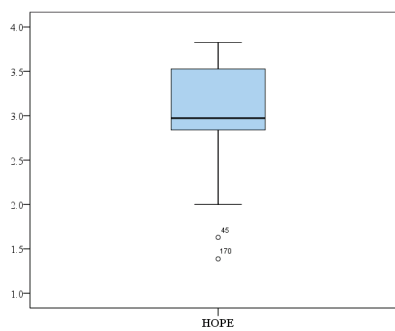
iii. HPLP

Figure 5. Histograms with fitted curves.

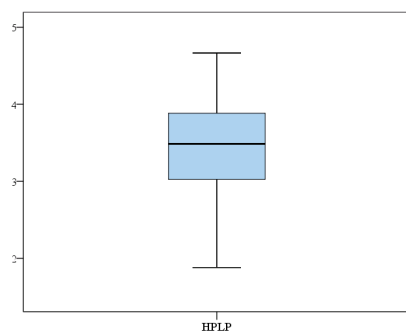
### Outlier Detection



i. QOL



ii. HOPE



iii. HPLP

Figure 6. Boxplots.

Examination of the boxplots (see Figure 6) notes the presence of influential outliers detected in both the HRQOL and hope variables. Several cases below the minimum level of the bottom 25% of the HRQOL and hope scores were evident. Outliers were not significant for the HPLP variable.

Table 16

*Summary of Statistics*

	QOL	HOPE	HPLP
N	179	179	179
Mean	2.592	3.081	3.423
Std. Deviation	0.503	0.480	0.640
Skewness	-0.521	-0.379	-0.275
Std. Error of Skewness	0.182	0.182	0.182
Skewness Ratio	-2.863	-2.082	-1.511
Kurtosis	0.068	0.256	-0.593
Std. Error of Kurtosis	0.361	0.361	0.361
Kurtosis Ratio	0.188	0.709	-1.643

Examination of the summary statistics (see table 16) shows the input variables and skewness/kurtosis estimations. The dependent variable, HRQOL, showed a negative skewed distribution (skewness statistic = -0.521) and had a positive kurtosis value (kurtosis statistic = 0.068). This indicated a very slight evidence of distribution with peaked distribution characteristics. The independent variable, hope, had a negative skewed distribution (skewness statistic = -0.379), and its kurtosis had a positive kurtosis value (kurtosis statistic = 0.256), which also indicated evidence of distribution with peaked distribution characteristics. The independent variable, HPLP, displayed a slight negative skewed distribution (*skewness statistic* = -0.275) and had a negative kurtosis value (*kurtosis statistic* = -0.593) indicated as evidence of platykurtic or with distribution with flat distribution characteristics. Warner (2013) suggested that skewness and kurtosis values of -1 to +1 are considered ideal, whereas values ranging from -2 to +2 are considered acceptable. Following this convention guideline by Warner (2013) suggests each of the input variables demonstrated normal distribution.

Table 17

*Test of Normality 1*

	Shapiro-Wilk		
	Statistic	df	Sig.
HOPE	0.937	179	0.000
QOL	0.975	179	0.003
HPLP	0.982	179	0.020

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

For the Shapiro-Wilk's test of normality, an *S-W* value of 1.0 and a non-significant p-value designates the given data is perfectly normal (Tabachnick & Fidell, 2007). The Shapiro-Wilk's test of normality (see Table 17) notes that the dependent variable, HRQOL,  $S-W(179) = 0.975, p < .05$ , and S-W value much closer to 1.0. This significant p-value indicated that approximation to normality was violated or the current data was not normally distributed according to the *S-W* convention.

The independent variable, hope,  $S-W(179) = 0.937, p < .05$ , with an *S-W* value close to 1.0 but a significant p-value, indicates that the approximation to normality was violated. The independent variable, HPLP,  $S-W(179) = 0.982, p < .05$ , with an S-W value closer 1.0 but a significant p-value, indicates that the approximation to normality was violated. Overall, the results from the Shapiro-Wilk test have revealed that each of the input variables have violated the normality assumption.

In conclusion, the sample data revealed the three input variables demonstrated to have achieved normal distribution. According to the conventions of observed skewness and kurtosis, values against an accepted threshold value ( $\pm 1.0$ ), and the skewness and kurtosis ratio test were met. Although the Shapiro-Wilk's test of normality did indicate

violation to normality, the attained *S-W* values for each of the three input variables were much closer to the value of 1.0 as a barometer of perfect normal distribution according (Tabachnick & Fidell, 2007) standards.

**Linear Assumptions.** Examination of the scatterplot matrix (see Figure 7) reveals a bivariate relationship of each of the two independent variables in Hope and HPLP. The scatterplots also show a bivariate relationship of the moderator variable disease severity (with five levels) to the dependent variable, HRQOL. The scatterplot matrix graph demonstrates adequate linearity.

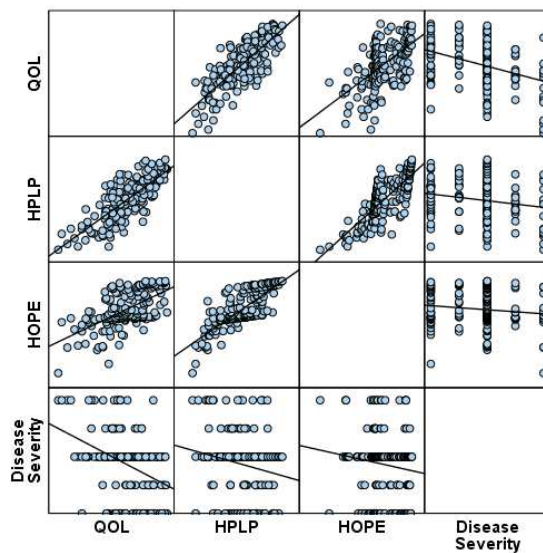


Figure 7. Scatterplot matrix.

**Multicollinearity Assumption.** Hair et al. (2010) describe multicollinearity as when any single independent variable is highly correlated ( $r > .70$ ) with a set of other independent variables. High multicollinearity among variables lessens an individual variable's unique variance.



According to Hair et al (2010), tolerance values should be above 10. Tolerance describes the amount of an independent variable's predictive capability that is not predicted by other independent variables in the equation. Tolerance values less than .10 lead to multicollinearity examination. A multicollinearity test among independent variables is called the Variance Inflation Factor (VIF). According to Field (2014), VIF values above 5.0 are good indicators of high multicollinearity. Inspection of the multicollinearity test (see Table 18) has revealed that independent variables in HOPE, HPLP, and Disease Severity had observed that tolerance values and VIF values were within the threshold standard. This indicated that problematic high correlation between the above predictors and moderator variables were not an issue. Therefore, multicollinearity problems between the independent variables are no concerns for this study.

Table 18

*Multicollinearity Test of Variables*

Model	Collinearity Statistics	
	Tolerance	VIF
HPLP	0.376	2.662
HOPE	0.382	2.615
Disease Severity	0.966	1.035

a. Dependent Variable: QOL

**Equality of Variances.** Levene's Test of Homogeneity of Variances (see Table 19) tests whether the variances between independent groups are equal (Field, 2014). The null hypothesis states that the variances across independent groups are equal, which indicates that any  $p$ -values significance above a set significance level have met the assumption of

equal variances. Using a significance level of .05, the moderator variable with five categorical levels/groups with  $p$ -values significance greater than the .05 level, the *Levene Statistic* = 1.756,  $p > .05$ , indicates that the error variances across the five groups are approximately equal from each other. Therefore, homogeneity of variances was assumed.

Table 19

*Test of Homogeneity of Variances*

QOL			
Levene Statistic	df1	df2	Sig.
1.756	4	174	0.140

Another similar test of homogeneity of variances, the test of homoscedasticity or heteroscedasticity, is the Breusch-Pagan test of homoscedasticity. According to Tabachnick and Fidell (2007), this test investigates whether the standardized residuals against the predicted values are random. The Breusch-Pagan test detects any heteroscedasticity, or whether error variances are equal between independent variables (continuous or interval scale).

Table 20

*Test of Heteroscedasticity of Variances (Breusch-Pagan Test)*

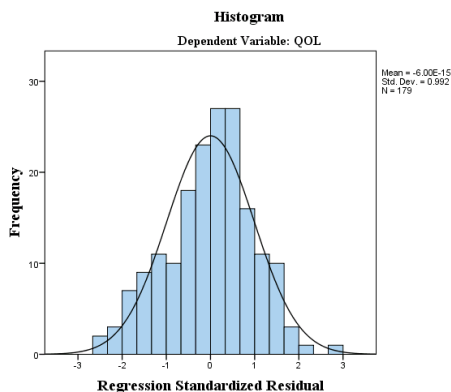
	Chi-Square value	Df	Sig
2 predictor variables ( <i>HOPE &amp; HPLP</i> ) and one moderator variable( <i>Disease Severity</i> )	2.759	179	0.430

The Breusch-Pagan test of heteroscedasticity (see Table 20), using a non-significance value of  $p > .05$ , suggested that the error variance between the two time

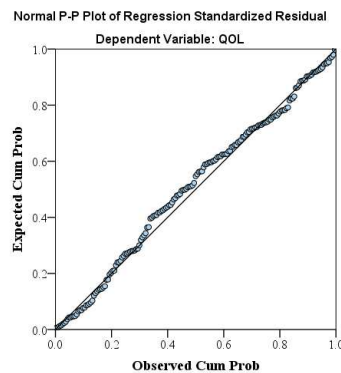
points are approximately equal from each other. Upon examination of the table, the three independent variables had a non-significant outcome,  $\chi^2(179) = 2.759, p > .05$ . This indicates that the error variances between the three independent variables are statistically equal to each other, and therefore meets the assumption of equality of variances.

**Independence of Error Terms.** According to Hair et al. (2010), multiple regression models assumed that each predicted value is independent, and that means that the predicted value is not related to any other predicted values. Thus, values do not have a systematic pattern that influences the predicted values from each other.

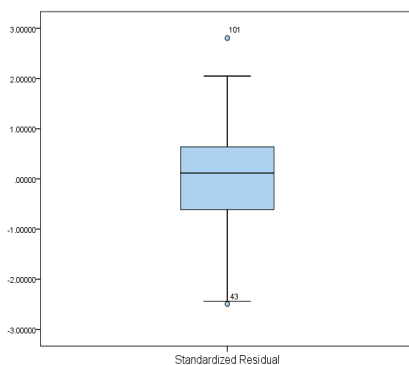
Additionally, Hair et al. (2010) recommends another diagnostic test to examine the histogram, normal Q-Q plot, scatterplots, boxplots of the residual terms, and the Shapiro-Wilk test of normality to determine whether non-normality of error terms are present. This comprehensive test is the Mahalanobis Distance ( $D^2$ ) test, which considers only the distance of an observation from the mean values of the independent variables and not impact the predicted value (Hair et al., 2010). The  $D^2$  test is another way to identify outliers.



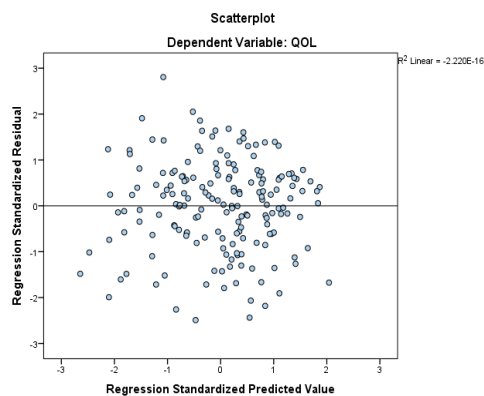
i. Histogram with fitted curves



ii. Normal Q-Q Plot



iii. Boxplot



iv. Scatterplot: Residual terms by predicted values

Figure 8. Visual inspection of the residual terms (errors).

An examination of Figure 8, specifically the histogram and the boxplot, reveals apparent symmetry of both the right and left tails of the distribution, which indicates normality of the residual terms. No systematic pattern influences the predicted values from each other. Even though the boxplots reveal data points outside the top and bottom 25% of the residual error scores, the normal distribution curve is not distorted. The diagonal line of the normal Q-Q plot shows a measure of normality. Data in this plot

points to the residual terms. Clusters above or below the line suggest that auto-correlation of the error terms were not present in the sample data. Additionally, an examination of the scatterplot between the residual terms and predicted values shows that the model's predicted values indicated random occurrences between predicted and errors. No systematic patterns were detected. The Shapiro-Wilk test of normality (see Table 21) also confirmed that the distribution of the residual terms are normally distributed,  $S-W(179) = .989, p > 0.05$ .

Table 21

*Test of Normality 2*

	Shapiro-Wilk		
	Statistic	df	Sig.
Standardized Residual	0.989	179	0.197

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

A Mahalanobis  $D (D^2)$  test was conducted using  $df = 3$  (2 independent variables and 1 moderator variable), and the p-value of .01 criterion at which a Chi-Square ( $\chi^2$ ) value of 11.34 constitutes as the threshold value to determine whether such residual errors were within acceptable limits; values greater than 11.34 indicates residual errors with non-random occurrences. Table 22 below had revealed 2 cases (ID# 170 and 45) and the subsequent Mahalanobis distance values for each observation did exceed such threshold and thus these 2 cases were excluded from the data analysis, and thus, sample size,  $n = 177$ . For model verification, a hypothesized model with the full sample (median imputed) will be compared to the hypothesized model with 2 cases removed to verify the model's stability.

Table 22

*Case Summaries*

	ID	Mahalanobis Distance
	1	<b>170</b>
	2	<b>45</b>
	3	79
	4	58
	5	100
	6	171
	7	96
	8	55
	9	174
	10	176
	11	158
	12	137
	13	90
	14	164
	15	84
<b>Total</b>	<b>N*</b>	<b>15</b>

\*Limited to 15 cases

### Summary of Path Analysis Assumptions

In conclusion, the current sample data, along with the input variables, have demonstrated to have met the five path analysis assumption tests of the multiple regression model. Therefore, the path analysis was the appropriate statistical model to estimate the overall regression and assess the direct and moderator effects of the hypothesized model.

***Research question 1. What is the level of hope in persons with Parkinson's disease?*** Persons with Parkinson's disease identified a high level of hope. The level of hope ranged from 16 to 48. Two cases that had significant outliers were removed. Table 24 shows the average hope scores with two cases removed ( $n = 177$ ),  $M = 16.565$  and a

standard deviation,  $SD = 2.261$ . In other words, at one standard deviation, the spread of hope scores range from 14.304 to 18.826. For full sample data ( $n = 179$ ), hope scores had an average,  $M = 16.480$  and a standard deviation,  $SD = 2.385$ . At one standard deviation, the spread of hope scores ranges from 14.095 to 18.865 at the full sample.

**Analysis of Question 1.** A one-sample t-test (see Table 23) shows that the difference in hope scores between the study's current sample data ( $N = 177$ ,  $M = 16.565$ ,  $SD = 2.261$ ) and the hypothesized cut-off *HOPE* score value ( $M=12.50$ ) were statistically significant. Statistics for the current sample test include  $t(176) = 23.922$ ,  $p = .000$ , 95% *CI* [3.730, 4.400] with a large effect size, *Cohen's d* = 1.80 and a post-hoc statistical power of 1.00.

For the full sample data ( $N = 179$ ,  $M = 16.480$ ,  $SD = 2.385$ ), the difference from hypothesized cut-off hope score value ( $M=12.50$ ) were statistically significant,  $t(178) = 22.327$ ,  $p = .000$ , 95% *CI* [3.629, 4.332]. The sample had a large effect size, *Cohen's d* = 1.67 and a post-hoc statistical power of 1.00.

Table 23

*One-Sample Test Hope Hypothesized Value of the Mean*

	Test Value = 12.50 (Hypothesized value)					
	t	df	Sig. (2-tailed)	Mean Difference	95% C.I. Lower	95% C.I. Upper
HOPE(2 cases removed)	23.922	176	0.000	4.065	3.730	4.400
HOPE (Full sample)	22.327	178	0.000	3.980	3.629	4.332

Hope was also tested using the top third of the hope scale with a test value of 15. According to Herth, some researchers using her tool have considered the lower third of the scores as low hope and the upper third of the scores as high hope (personal communication, February 19, 2017). The upper one third of the hope scores for the current study's sample was considered 15. The test value for the upper third cut off was tested to see if the t-test for hope showed stability. The t-test for hope (two cases removed for outliers) shows the study's sample data (N= 177, M =1.56) (see Table 24). The upper third cut-off increases stability, as it is statistically significant for hope,  $t(176) = 9.21, p = .000, 95\% CI [1.230, 1.90]$ . The sample had a large effect size, *Cohen's d* = 1.80 and a post-hoc statistical power of 1.00. A t-test was also completed to compare the means of hope and gender. Females were found to have a slightly higher level of hope,  $M = 17.03, SD = 2.18$ , versus men who had a mean level of hope,  $M = 16.27, SD = 2.27$  (see Table 25). In addition, a correlation was run to compare hope to age. Hope did not show a significant correlation to the participant's age (N = 177,  $r = .057, p = 0.45$ ) (see Table 26).

Table 24

<i>One-Sample Test Hope 1/3 Cut Off</i>						
Test Value = 15 (Upper 1/3 cut off)						
	t	df	Sig. (2-tailed)	Mean Difference	95% C.I. Lower	95% C.I. Upper
HOPE	9.21	176	0.000	1.560	1.230	1.900



Table 25

*Group Statistics for Hope and Gender*

Gender		N	Mean	Std. Deviation	Std. Error Mean
HOPE_Hyp01	Female	69	17.0290	2.17588	.26194
	Male	108	16.2685	2.27381	.21880

Table 26

*Correlations of Age*

		Age
HOPE_Hyp01	Pearson	-.057
	Correlation	.057
	Sig. (2-tailed)	.452
	N	177

### Summary

In conclusion, the study rejected the null hypothesis for question one; there is no difference in the level of hope between groups. There is sufficient evidence to support the study's assumptions. This suggests that the hope scores of the current sample population is significantly higher compared to both the cut-off value of the hypothesized mean in the population and the top third of the scores from the Hope scale used in this sample.

**Research question 2. What is the relationship between hope and health-promoting behaviors on HRQOL in persons with Parkinson's disease?**

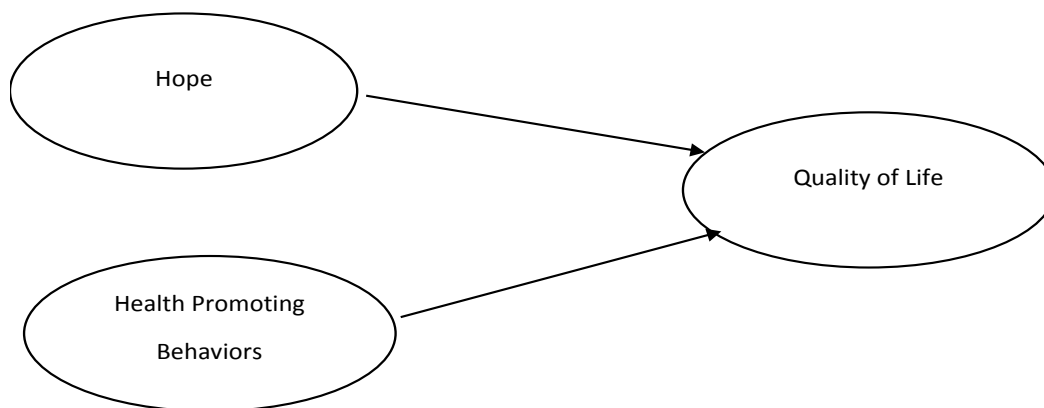


Figure 9. Conceptual diagram of the hypothesized path model.

**Analysis of Question 2.** Examination of Table 27 shows the average HRQOL scores ( $n = 177$ ) was,  $M = 28.853$  and a standard deviation,  $SD = 6.179$  with the lowest observed minimum score,  $Min = 9.0$  and maximum score,  $Max = 40.0$ . At one standard deviation, the spread of QOL measure ranges from 22.674 to 35.032. The HOPE scale had an average score,  $M = 16.565$  and standard deviation,  $SD = 2.261$  with the lowest observed minimum score,  $Min = 11.0$  and maximum score,  $Max = 20.0$ . At one standard deviation, the spread of the HOPE measure ranges from 14.304 to 18.826. Lastly, the HPLP scale had an average score of  $M = 58.729$  and standard deviation of  $SD = 9.441$ , with the lowest observed minimum score,  $Min = 33.0$  and maximum score,  $Max = 83.0$ . At one standard deviation, the spread of the HPLP measure ranges from 49.288 to 68.170.

Table 27

*Descriptive Statistics*

	QOL	HOPE	HPLP
N	177	177	177
Mean	28.853	16.565	58.729
Median	29	16	59
Std. Deviation	6.179	2.261	9.441
Skewness	-0.512	0.025	-0.146
Std. Error of Skewness	0.183	0.183	0.183
Kurtosis	0.066	-0.944	-0.231
Std. Error of Kurtosis	0.363	0.363	0.363
Minimum	9	11	33
Maximum	40	20	83

The hypothesized model had an observed coefficient of determination of  $R^2 = .620$ , and an *Adj. R*<sup>2</sup> = .615 (see Table 28). Hope was entered first into the regression based on the theoretical influences hope has on health-promoting behaviors. When both explanatory variables of HOPE and HPLP were entered in the model, about 62% of the variation of scores within the dependent measure in HRQOL was explained. Therefore, HRQOL could be predicted by both predictor variables in the model. Overall, the hypothesized regression model has a large effect size, which indicates that the level of associations between the predictors and the outcome variable were large. Thus, 38% of variance could be from factors other than the two explanatory variables presented in the model.

Table 28

*Model Summary*

Model	R Square	Adjusted R Square	Std Error of the Estimate	Change Statistics			Change Statistics		
				R square Change	F Change	df1	df2	Sig F Change	Dutbin-Watson
1	0.328	0.324	0.404	0.328	85.405	1	175	0.000	
2	0.620	0.615	0.305	0.292	133.415	1	174	0.000	1.995

- a. Predictor variables: Hope
- b. Predictor variables: Hope, HPLP
- c. Dependen variable: QOL

Analysis of coefficients table (see Table 29) shows that the HPLP was a significant predictor of HRQOL while accounting for the direct effect of HOPE measure in the model,  $t = 11.551$ ,  $p < .001$ , 95% C.I. [0.553, 0.781]. The positive slope for HPLP as a predictor of HRQOL indicated that there was a 0.667 (Beta coefficient) increase in HRQOL measure for each increase in HPLP levels, while controlling for the effect of HOPE measure in the model.

Using the Squared Partial Correlation, approximately 43% of the variance in HRQOL measure was uniquely estimated by HPLP while accounting for the effect of hope measure. Explanatory variable in hope was not a significant predictor of HRQOL measure while accounting for the direct effect of HPLP measure in the mode,  $t = -1.078$ ,  $p > .05$ , 95% C.I. [-0.243, 0.071]. Observed statistical power of the hypothesized model was 1.0 or 100% detection rate of avoiding a Type II error.

Table 29

Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Partial
	B	Std. Error	Beta			Lower Bound	Upper Bound	
1 (Constant)	0.675	0.211		3.201	0.002	0.259	1.091	
HOPE	0.622	0.067	0.573	9.242	0.000	0.489	0.755	0.573
2 (Constant)	0.573	0.159		3.599	0.000	0.259	0.888	
HOPE	-0.086	0.080	-0.079	-1.078	0.282	-0.243	0.071	-0.081
HPLP	0.667	0.058	0.846	11.551	0.000	0.553	0.781	0.659

a. Dependent variable: QOL

Lastly, comparisons between path models using a non-CFA-adjusted path model against CFA-adjusted path model reveals the CFA adjusted remarkably improved goodness of fit (see Table 30) of the hypothesized path model. According to Hair et al. (2010), the lower values of Akaike Information Criterion (AIC), from 1130.165 to 86.758 and Bayesian Information Criterion (BIC) from 1142.91 to 99.46 are indicative for good measures of model fit.

Table 30

*Model Fit Comparison: Non-CFA Adjusted vs CFA Adjusted*

	AIC	BIC
Non-CFA adjusted Path Model	1130.165	1142.914
CFA adjusted Path Model	86.758	99.463

### Summary

In conclusion, the study rejects the null hypothesis for question two; there is not a relationship between hope, health promoting behaviors, and HRQOL. There was sufficient evidence to support the assumption, which claims that there were at least one of

the two explanatory variables that were statistically significant in predicting the variation of HRQOL scores while controlling the direct effects of both explanatory variables.

HPLP was a significant predictor of HRQOL. However, HOPE was not a significant predictor of HRQOL measure while accounting for the direct effect of HPLP (see Figure 10).

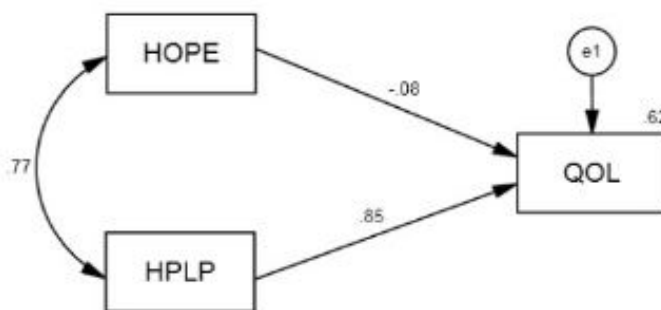


Figure 10. Final path analysis model for Hypothesis 2.

The hypothesized model had an observed coefficient of determination of  $R^2 = .62$ . This means that together, hope and HPLP explained about 62% of the variation of scores within the dependent measure in HRQOL. Hope becomes non-significant with the inclusion of HPLP.

**Research question 3. What is the relationship among hope, health-promoting behaviors, HRQOL, and disease severity?**

**Analysis of Question 3.** For the path analysis, a multiple regression method used a total of four input variables. There were two variables assigned as independent variables, or predictors: *i) HPLP* = a scale variable with an interval measurement, and *ii)*

*HOPE* = a scale variable with an interval measurement. One variable was assigned as a moderator variable: *iii) Disease Severity* = a categorical variable with an ordinal measurement (1= Stage 1, 2= Stage 2, 3 = Stage 3, 4 = Stage 4 & 5 =Stage 5). Lastly, one criterion variable was assigned as a dependent variable; or criterion *iv) HRQOL* = a scale variable with interval measurement. For the one sample t-test method, one variable was assigned, *HOPE*, as the dependent variable and its median value as the test value. The total sample size was  $n= 179$ .

Table 31

*Path Model Summary of the Multi-Group Effects*

Model	Bivariate Correlation of IV's	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R- Squared	
		B	Std. Error	Beta				
Stage 1	0.695	QOL <--- HOPE	-0.142	0.144	-0.141	- 0.983	n.s.	0.626
		QOL <--- HPLP	0.721	0.117	0.883	6.138	***	
Stage 2	0.862	QOL <--- HOPE	-0.222	0.227	-0.251	- 0.980	n.s.	0.705
		QOL <--- HPLP	0.699	0.171	1.047	4.081	***	
Stage 3	0.789	QOL <--- HOPE	-0.021	0.108	-0.021	- 0.197	n.s.	0.603
		QOL <--- HPLP	0.570	0.077	0.793	7.442	***	
Stage 4	0.766	QOL <--- HOPE	-0.506	0.265	-0.576	- 1.911	0.056	0.489
		QOL <--- HPLP	0.752	0.219	1.034	3.431	***	
Stage 5	0.717	QOL <--- HOPE	0.049	0.211	0.044	0.230	n.s.	0.761
		QOL <--- HPLP	0.655	0.148	0.840	4.415	***	

Stage 1's impact on the hypothesized model produced a large coefficient of determination,  $R^2 = 0.626$ , and the explanatory variable in HPLP was significant in the



hypothesized path model,  $t(4, 174) = 6.138, p < .001$  (see Table 31). Stage 2's impact on the hypothesized model also produced a large coefficient of determination,  $R^2 = 0.705$ , and the explanatory variable in HPLP was significant in the hypothesized path model,  $t(4, 174) = 4.081, p < .001$ . Stage 3's impact on the hypothesized model produced a large coefficient of determination,  $R^2 = 0.603$ , and the explanatory variable in *HPLP* was significant in the hypothesized path model,  $t(4, 174) = 7.442, p < .001$ . Stage 4's impact on the hypothesized model produced a coefficient of determination,  $R^2 = 0.489$ , and the explanatory variable in HPLP was significant in the hypothesized path model,  $t(4, 174) = 3.431, p < .001$ . Finally, Stage 5's impact on the hypothesized model produced a large coefficient of determination,  $R^2 = 0.761$ , and the explanatory variable in *HPLP* was significant in the hypothesized path model,  $t(4, 174) = 4.415, p < .001$ .

A Chi-Square difference test was conducted to test whether the five stages of disease severity moderated the direct effects between the two explanatory variables in hope and HPLP to the criterion variable in HRQOL measure. The result from the Chi-Square test of the multi-group moderation models was not significant,  $\chi^2(8) = 5.936, p = .654$ . This indicated that there were no differences between the five stages of severity given the hypothesized path model. Therefore, there was no evidence of moderating effects of the varying stages of disease severity on the direct effects of hope and HPLP to the criterion variable in HRQOL measure.

Table 32

*Model Fit Indices: Multi-group Moderation*

	Acceptable Thresholds	Observed Model Fit
GFI	> .95 great; > .90 traditional; > .80 permissible *	0.98
AGFI	> .95 great; > .90 traditional; > .80 permissible *	0.92
RMR	< .07*	0.02
RMSEA	< .05 good; .05 - .10 moderate; > .10 bad*	0.00

\*Hu and Bentler (1999)

Table 32 is a measure of model fit using Hu and Bentler (1999) conventions of goodness-of-fit indices. The five level multi-group moderation models appears to achieve adequate and reasonable model fit. This confirms that hypothesized moderated model parsimoniously fits the characteristics of the sample data.

### Summary

In conclusion, the study failed to reject the null hypothesis. There is not a relationship between hope, health promoting behaviors, and HRQOL while controlling for disease severity. There was not sufficient evidence to support the assumption, which claims that there were moderating effects of varying stages of disease severity and its relation to the direct effects of hope and HPLP to the dependent measure

in HRQOL.

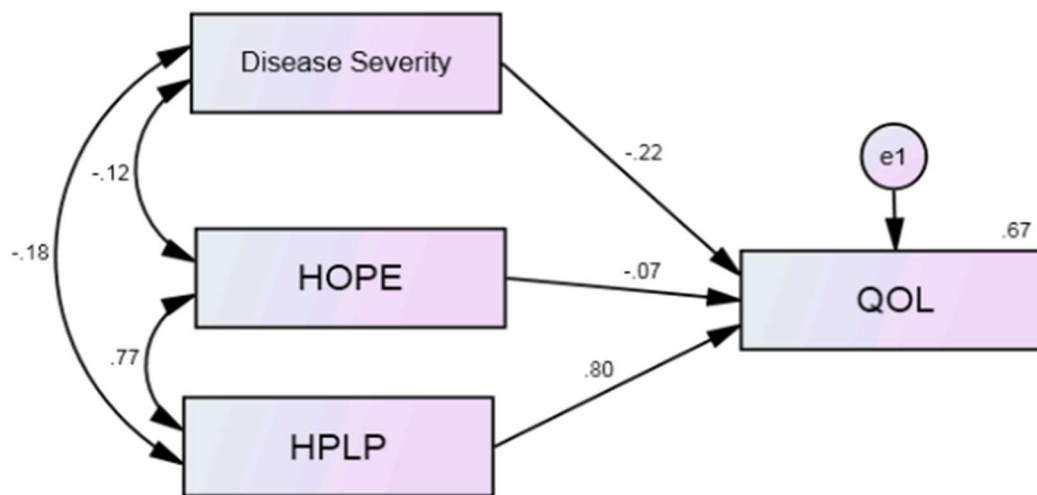


Figure 11. Final path analysis model for Hypothesis 3.

The hypothesized model had an observed coefficient of determination of  $R^2 = .67$ . This means that together, hope, HPLP, and disease severity explained about 67% of the variation of scores within the dependent measure in HRQOL. The path model suggested that the HRQOL means between the five disease severity stages were different. However, no difference was detected between the five disease severity stages for both hope and HPLP. Therefore, no moderating effect of disease severity could be examined.

## CHAPTER 5: SUMMARY OF FINDINGS

### Introduction

The purpose of this research was to examine the relationships between the concepts of hope, health-promoting behaviors, and HRQOL in persons with Parkinson's disease. This chapter discusses the study outcomes, strengths, limitations, and implications for nursing practice.

### Summary of Findings

The participants of the study were from a convenience sample of Parkinson's disease support groups, the South Dakota Parkinson's Foundation, and the Midwest Parkinson's Foundation mailing list. The average age of the study participant was 73 years. Sixty percent of persons in the study were male, which relates to Parkinson's disease being slightly higher in men than women. The majority of participants were Caucasian and married. Over half of participants were diagnosed within the last five years. Less than half of the participants grew up on a farm.

**Research Questions.** The literature and Stuijbergen's Explanatory Model of Health-Promotion and Quality of Life for Persons with Chronic Conditions helped develop questions related to health-promoting behaviors, HRQOL, and disease severity. The hope-related question was derived from nurse researcher inquiry.

**Research Question 1: What is the level of hope in persons with Parkinson's disease?** The findings of Research Question 1 were significant. The range of scores was a minimum score of five and a maximum score of 20. The hope mean was at 16.57. The sample mean ( $N = 177$ ,  $M = 16.565$ ,  $SD = 2.261$ ) was statistically different and significantly higher compared to the hypothesized population mean ( $M=12.50$ ). The upper one third of the hope scale, hope value equal to 15, was also significant,  $p = .000$ .

Hope was noted to be significantly higher for women, but no significant difference was noted for hope related to age. Overall, findings are substantiated that persons with Parkinson's disease have a high level of hope compared to both the test value of the hypothesized population mean and the top third of the scores from the Hope scale used in this sample.

**Research Question 2: What is the relationship between hope and health-promoting behaviors on HRQOL in persons with Parkinson's disease?** The findings of Research Question 2 were significant. Multiple linear regression analysis identified that hope was a statistically significant predictor variable of HRQOL. However, the analysis found that when disease severity and health-promoting behaviors were added to the regression, hope was no longer a statistically significant predictor of HRQOL.

This analysis identified health-promoting behaviors as a significant predictor to HRQOL. Multiple studies by Stuijbergen established an association between health-promoting behaviors and a strong HRQOL (Stuijbergen, 1995; Stuijbergen & Rogers, 2005; Stuijbergen, Seraphine, Harrison, & Adachi, 2004). Fowler (1997) noted a positive relationship between hope and health-promoting behaviors in persons with Parkinson's disease.

**Research Question 3: What is the relationship among hope, health-promoting behaviors, HRQOL, and disease severity?** The findings of Research Question 3 were not significant (more likely due to the unequal and small sample size for Stages 2, 4, and 5). Multiple regressions were conducted in a structural equation modeling format. According to the path analysis, disease severity has a moderating effect as it directly influences the relationship between hope, health-promoting behaviors, and

HRQOL. At disease severity stage 4 of Parkinson's disease, both hope and health-promoting behaviors were significant predictors of HRQOL. Hope was not significant in predicting HRQOL at the rest of the stages, but health-promoting behaviors were predictors of HRQOL at all disease severity stages. The major drawbacks of this model were that the sample size was small and uneven for the five stages of disease severity. Without the inclusion of health-promoting behavior in this path model, hope is a significant predictor of HRQOL.

According to the nursing literature, hope has a positive contribution to HRQOL (Rustoen, 1995; Farran et al., 1995). However, when accounting for the effects of the health-promoting behaviors in this study, hope becomes non-significant, which indicates that health-promoting behaviors modify the relationship. This is the first study to create an association between health-promoting behaviors, HRQOL, and hope in people with Parkinson's disease.

### **Implications for Nursing Practice**

Parkinson's disease is a health concern that is expected to double by 2030 and triple by 2050 (NPF, 2015). The growth of this disease will impact nurses who provide care for those with this progressive disease. Patient outcomes and HRQOL may improve if nurses design nursing interventions to improve hope and health-promoting behaviors, which in turn supports HRQOL. In addition, nurses have an important role to raise awareness about gaps in resources and advocate for policy development like the Cures Law that can help develop new treatments. Nurses can use research to collaborate with lawmakers to work together to create legislation that benefits those with Parkinson's disease. Nurses

can also work with other clinicians to build evidence for funding to make devices, like a DBS, more commonplace.

Findings for Research Question 1 pronounced the significance of hope in the lives of persons with Parkinson's disease. Hope is essential to the story of human life. Persons with chronic illness are able to apply hope to overcome daily struggles and live a better life. At the end stage of disease, hope allows persons to die with dignity. Yet nurses lack an understanding of patients' hope (Chi, 2007). Although hope is recognized as an important human need, some nurses lack skills and the time needed to provide critical emotional support. Advanced practice nurses can develop guidelines to assess hope, maintain hope, and provide strategies to implement hope. Nurse educators can advance the professional role of the nurse by teaching nursing students concepts of hope and hope interventions. Nurses can collaborate with their patients to discover meaningful hope-building activities.

The results of Research Question 2 calls on nurses to help patients implement health-promoting behavior strategies. Health-promoting behaviors were correlated with a strong HRQOL. Together hope, HPLP, and disease severity explained about 67% of the variation of scores for HRQOL. Advance practice nurses can gain insight related to methods of health-promoting behaviors for those with Parkinson's disease and identify environments that lead to health-promoting behaviors. Better health-promoting behaviors are crucial to help those with chronic illness maintain independence and quality of life (Parcel, Barlett, Bruhm, 1986; Stuijbergen, 1995; Stuijbergen & Rogers, 2005; Stuijbergen et al., 2004).

The findings of Research Question 3 are pertinent to nursing practice for many reasons. The mean for HRQOL was different based on the levels of disease severity. However, the means for both hope and HPLP were not different, based on the levels of disease severity. Therefore, nurses have the opportunity to implement nursing interventions for hope and HPLP for all persons at various stages of Parkinson's disease. Participating in hope intervention groups has been a positive experience for persons with cancer (Rusteen, Wiklund, Hanestad, & Moum, 1998; Herth, 2001). However, no hope intervention program exists for persons with Parkinson's disease. Advance practice nurses could implement a hope intervention program for their patients in the hospital or for persons attending support groups. The hope intervention program would be based on strategies to improve the level of hope by doing exercises that produce hope. Herth (2001) has used activities such as making a hope mantel, hope journaling, hope tapes, hope drawings, hope energy saving baskets, joy collages, hope kits, hope memory books, and other activities to engender hope.

Nurses can use patient education as an avenue to increase hope and health-promoting behaviors. Incorporating hope-improvement strategies could be seen as part of activities of daily living (ADLs). Nurses could add to their ADL checklist *incorporate hope strategy*. This activity could be derived from surveying nurses or having focus groups generate ideas for strategies to improve hope. Patients could also be surveyed and asked, "Did your nurse enable hope for you today? If yes, please explain." Exploring features of hope related to the patient experience can help identify behaviors that encourage attributes of hope. Similar activities could be used to incorporate health promotion as part of daily patient education. Nurse and patient collaboration can improve



the level of hope and health behaviors. Advance practice nurses can research hope strategies by asking patients and those with chronic illness questions that lead to constructive nursing care guidelines for hope and health-promoting behavior interventions.

**Stuifbergen's Explanatory Model of Health-Promoting Behaviors within Chronic Conditions.** The findings of this study support the conceptualization of Stuifbergen's Explanatory Model of Health Promoting Behaviors within Chronic Conditions. Disease severity and hope influenced the concepts of health promotion and quality of life. Having hope and health-promoting behaviors can help persons with Parkinson's disease better manage symptoms that influence quality of life.

The research findings altered the hypothesized relationships of the study variables (see Figure 11). Hope was a statistically significant predictor variable of HRQOL. However, when health-promoting behaviors were added to the regression, hope was no longer a statistically significant predictor of HRQOL. Hope has a direct effect on HRQOL, and hope also was modified when HPLP was added to the regression. Together, hope and HPLP explained about 62% of the variation of scores within the dependent measure in HRQOL. Health-promoting behaviors are a significant predictor to HRQOL. There was not sufficient evidence to support the assumption, which claims that there were moderating effects of varying stages of disease severity and its relation to the direct effects of hope and HPLP to the dependent measure in HRQOL.

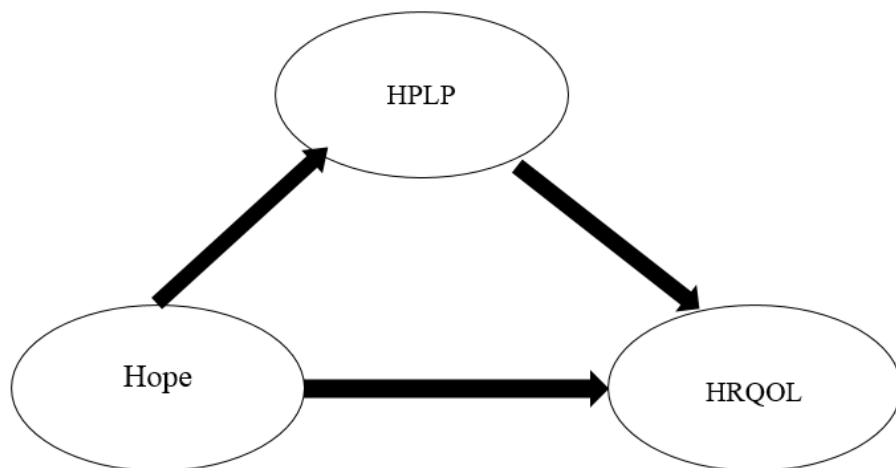


Figure 12. New model for variables: hope, health-promoting behaviors and HRQOL.

### Implications for Theoretical Framework

According to Stuijbergen & Rogers (1997), an increase in disease severity parallels with an increase in barriers. Mobility, anxiety, depression, and pain are barriers impacting HRQOL that the PDQ-8 measured in this study. Stuijbergen's theory notes that health-promoting behaviors lessen the impact severity that illness has on impairing quality of life. Other variables that were prominent in Stuijbergen's theory include self-efficacy, resources, and acceptance

**Severity of Illness.** In this study, high disease severity correlated with much worse quality of life. The persons in the study with the highest level of disease severity had the lowest quality of life. According to Stuijbergen's framework, when severity of illness increases, barriers will likely increase. Some studies suggest that having Parkinson's disease increases the risk of developing Lewy Body Dementia (LBD) (Dolhun, 2015; Todorova, Jenner, & Chaudhuri, 2014). A handful of participants wrote on the survey that they had LBD. This is the second-most progressive form of dementia

and involves proteins, called Lewy bodies, clumping together in the brain (Mayo Clinic, 2017). The persons with LBD were noted to have high disease severity scores and low scores on quality of life.

The results of this study partially support Stuijbergen's theoretical model. This study found that health-promoting behaviors were a statistically significant predictor of HRQOL  $t = 11.551, p < .001, 95\% \text{ C.I. } [0.553, 0.781]$ . The results of disease severity on HPLP is not a significant predictor of HRQOL. There was not a difference in relationship between the five stages of disease severity on health-promoting behaviors or hope. The result from the Chi-Square test was not significant,  $\chi^2(8) = 5.936, p = .654$ . Therefore, there was not moderation of the varying stages of disease severity on the direct effects of hope and HPLP on HRQOL. Nonetheless, significant results suggested a difference for HRQOL between the five stages of disease severity  $F(4, 172) = 17.821, p < .001$ .

**Barriers.** Participants with Parkinson's disease also encountered fatigue, pain, sleep problems, and bladder problems, which are major barriers that will increase severity of illness and therefore decrease HRQOL (Lou, 2015; Kadastik-Eerme, Rosenthal, Paju, Muldmaa, & Taba, 2015). Depression, anxiety, and decline in cognitive impairment in Parkinson's disease are possible barriers that could result in lower HRQOL (Welsch et al., 2003).

**Self-Efficacy.** Health-promoting behaviors improve with self-efficacy (Strecher et al., 1986; Stuijbergen & Becker, 1994). Self-efficacy and social cognitive theory (Bandura, 1997) describe health promotion starting with a goal, and for a person with Parkinson's disease, that goal for health behavior begins with forming a lifestyle habit to help cope with the disease. Having these good habits can help improve the quality of life.

**Resources.** Stuijbergen (1995) described social support as one key resource.

People who attend support groups were the key participants in the study and made up the majority of the population surveyed for this study. Attending a support group is a good resource of social support. Surveying those that attend a support group may have higher social support levels than those who did not participate in this study and are isolated from support groups. In the rural state where the study took place, several persons may not have access to a support group as a resource. At some of the support group meetings, the nurse researcher noted that some attendants drove up to 45 minutes to an hour to attend.

Stuijbergen (1995) also noted income as a critical resource. A handful of persons in this study noted that when they had undergone a DBS procedure, their quality of life improved greatly. Hence, DBS may have lessened disease severity and had a positive impact on HRQOL for these participants. In a meta-analysis of six randomized controlled trials ( $n = 1,184$ ), significant improvement in motor symptoms and higher quality of life after DBS procedure was reported (Perestelo-Pérez et al., 2014). Advocating for insurance coverage to help lessen the costs a DBS would benefit those who qualify for this device.

**Acceptance.** The phase of Stuijbergen's model before health-promoting behaviors is acceptance. The concept is significant for people with Parkinson's disease because it helps with coping. Kubler-Ross (1969) describes acceptance as the last stage of grief. Persons with Parkinson's disease must live in the space between accepting that there is no cure for the chronically progressive disease and the space where they hope for a cure. For many persons with chronic diseases, this space leads to health-promoting behaviors.

### **Strengths of the Study**

Theoretical definitions and frameworks guide this study. The conceptual definition of hope created by Dufault and Martocchio's (1985) was operationalized in the questions of the HHI tool. The other conceptual definitions and tools relate. The study protected against bias by having an adequate sample size of 179 persons with Parkinson's disease.

**Instruments.** Prior studies established a high amount of reliability and validity for the three instruments used. This study also identified a high degree of reliability and validity for the instruments. Measures of model fit for the three-factor model structure was achieved. The robust factor model used in the study's hypothesis testing stage was a strength of the study.

Construct reliability of the confirmed factor structure model showed an adequate inter-item consistency greater than the standard threshold Cronbach's Alpha value of 0.70, HRQOL = .792, HPLP = .857, and hope = .844. The HHI is a useful tool to assess hope in persons with Parkinson's disease. The PDQ-8 is a useful tool to assess HRQOL in people with Parkinson's disease.

### **Limitations of the Study**

The descriptive correlational design used by this study does not report causality but rather describes the relationships of the study variables (Polit & Beck, 2012). The size of the sample was sufficient until it was broken down into the disease severity stages. The sample size may be a limitation particularly related to Research Question 3, which breaks down the sample into smaller groups based on disease severity. The non-significant results to Research Question 3 may have been different had a larger sample been available. A possible strong moderating effect of hope and health-promoting behaviors on HRQOL may be noted in future studies with a larger sample.

The majority of the sample was a convenience sample of persons who participated in support groups who were in early stages of Parkinson's disease. Research by Herth on hope and quality of life in persons with cancer does not measure hope in the first five years since diagnosis of disease because the shock of new diagnosis may skew results (Herth, 1989). Including those in this study that were recently diagnosed could be a limitation. The sample was predominantly Caucasian, lacking ethnic diversity, which is an additional limitation of the study. Selecting persons who were in support groups may be a barrier to true representation of health-promoting behaviors, as these persons have established a connection of social support. Data for health-promoting behaviors may be skewed for this study because participants were selected from a support group and thus are more inclined to exhibit health-promoting behaviors versus the general population.

Although evidence suggests that pesticides increase the risk of Parkinson's disease, this study did not find a connection between agriculture and Parkinson's disease. Less than half the participants were from agriculture backgrounds. However, some of the

persons from agriculture backgrounds may have not been represented because the majority of data collection was during the fall harvest months.

Another limitation is that persons self-report the stage of the disease, which may misjudge the disease severity. Disease severity can lead to fatigue, and the surveys were long, especially for persons with Parkinson's disease who may struggle with small handwriting. Survey fatigue is an additional limitation of this study. A possible limitation may be having participants who had early-stage dementia and did not know it. The two surveys that were discarded for outliers had the highest level of disease severity stage 5, and it was noted on the survey that the participants had LBD.

The HPLP-II questionnaire was long, having 52 items. Six HPLP items were dropped during the EFA stage because of large residual errors in order to get adequate validity, reliability, and model fit. Survey fatigue could have contributed to limitations of the study and problem with errors accounted for with the HPLP scale.

### **Recommendations for Future Study**

**Health-Related Quality of Life.** James Parkinson's (1817) landmark *Essay on the Shaking Palsy* first noted impairments on quality of life from Parkinson's disease 200 years ago. This classic study discovered the signs and symptoms for the disease, but history has not yet provided a cure. Therefore, advances to increase the quality of life, despite disease progression, are pertinent. Drug therapy has made little improvement since the discovery of Sinemet (carbidopa-levodopa) in the early 1960s. This drug remains the treatment of choice to improve mobility in persons with the disease. However, this drug also causes many possible side effects, such as daytime sleepiness, somnolence, dyskinesia, confusion, hallucinations, and compulsive behaviors (Merck

Sharp & Dohme Corp, 2014). Taking drugs to improve motor symptoms for some persons with Parkinson's disease can be a double-edged sword because the side effects of the drug can also decrease HRQOL.

**Health-Promoting Behaviors Related to Nutrition.** Research for a new medicine being developed includes a possible more natural remedy using turmeric, an herb commonly used in Indian food, as a component of a neuroprotective drug. According to Mythri and Bharath (2012), turmeric is made of curcumin, which has great antioxidant and anti-inflammatory effects, and contains other neuroprotective properties that cross the blood-brain barrier. This spice has long been used as healing therapies for not only neuroprotective, but also cardiovascular, gastrointestinal, and hepatoprotective, and other inflammatory issues in Chinese and Ayurvedic systems of medicine (Monograph, 2001). Future research could include a randomized control trial implementing dietary changes to include turmeric and the effect on symptoms.

**Hope and Health-Promoting Behavior Intervention Studies.** Nurses can play a significant role in influencing hope and health-promoting behaviors for persons with Parkinson's disease. Intervention studies to promote hope and health behaviors for persons with Parkinson's disease are needed. Hope interventions and health-promoting behaviors may support HRQOL of an ongoing nature. Persons will be introduced to concepts of hope and health-promoting behaviors as part of their daily routines. Support groups and conferences for persons with Parkinson's disease could be the setting for future intervention studies.



## **Conclusion**

This descriptive correlational study examined the relationship between hope, health-promoting behaviors, quality of life, and disease severity in persons with Parkinson's disease. Stuijbergen's Explanatory Model of Health-Promoting Behaviors within Chronic Conditions guided the study. Research findings from the study on hope, health-promoting behaviors, health-related quality of life, and disease severity in persons with Parkinson's disease and implications for nursing practice were discussed. Strengths and limitations of the conceptual framework were analyzed. The implications of the study and recommendations for future studies related to hope, health-promoting behaviors, and health-related quality of life were examined.

The study generates new nursing knowledge on hope and health-promoting behaviors for persons with Parkinson's disease. The study identified a relationship between hope, health-promoting behaviors, and quality of life. These important findings indicate that hope is beneficial to quality of life. Health-promoting behaviors are statistically significant predictors of health-related quality of life. The increased knowledge will raise awareness on the importance of hope and health-promoting behaviors for persons with chronic diseases like Parkinson's disease.

This study represents an innovative starting point for future studies implementing hope interventions and health-promoting behaviors. Despite advancing disease severity and the crippling effects of Parkinson's disease, hope and health-promoting behaviors predict quality of life. The result of hope interventions and health promoting behaviors in persons with Parkinson's disease is a catalyst leading to improved quality of life, not only for those afflicted with the disease, but also their families.

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## Appendix A

**Demographic instrument for background information**

1. Participant age \_\_\_\_\_
2. Gender:  
 Male  
 Female
3. Marital status  
 Single, never married  
 Married  
 Divorced  
 Separated  
 Widowed  
 In a relationship, but not married
4. Ethnicity  
 White  
 Native American  
 Hispanic  
 Asian-Pacific Islander  
 African American
5. Length of time since diagnosis \_\_\_\_\_
6. Did you grow up on a farm/ranch?  
 Yes  
 No
7. Length of time on a farm/ranch \_\_\_\_\_

## Appendix B

**Hoehn and Yahr Stages of Parkinson's Disease Scale**

Stage 01	Symptoms on one side only
Stage 02	Symptoms on both sides without balance impairment
Stage 03	Mild to moderate disease, some postural instability, physically independent
Stage 04	Severe disease, able to walk or stand unassisted
Stage 05	Wheelchair bound or bedridden unless assisted

The following statement best describes my symptoms, when I feel at my **best**: (*check one*)

- q<sub>1</sub> I have symptoms on the one side of my body only
- q<sub>2</sub> I have symptoms on both sides of the body, but my balance is not affected
- q<sub>3</sub> I have mild to moderate symptoms on both sides of the body, and my balance is somewhat affected, but I am physically independent
- q<sub>4</sub> My symptoms are severe, but I am still able to stand and walk without help
- q<sub>5</sub> I cannot get out of the bed or up from a chair unless somebody helps me



## Appendix C

**Health-Promoting Lifestyle Profile (HPLP) II**

DIRECTIONS: This questionnaire contains statements about your *present* way of life or personal habits. Please respond to each item as accurately as possible, and try not to skip any item. Indicate the frequency with which you engage in each behavior by circling:

**N** for never, **S** for sometimes, **O** for often, or **R** for routinely

	NEVER	SOMETIMES	OFTEN	ROUTINELY
1. Discuss my problems and concerns with people close to me.	N	S	O	R
2. Choose a diet low in fat, saturated fat, and cholesterol.	N	S	O	R
3. Report any unusual signs or symptoms to a physician or other health professional.	N	S	O	R
4. Follow a planned exercise program.	N	S	O	R
5. Get enough sleep.	N	S	O	R
6. Feel I am growing and changing in positive ways.	N	S	O	R
7. Praise other people easily for their achievements.	N	S	O	R
8. Limit use of sugars and food containing sugar (sweets).	N	S	O	R

- |   |   |   |   |   |
|---|---|---|---|---|
| 9. Read or watch TV programs about improving health.                                  | N | S | O | R |
| 10. Exercise vigorously for 20 or more minutes at least three times a week (such as   | N | S | O | R |
| 11. Take some time for relaxation each day.   | N | S | O | R |
| 12. Believe that my life has purpose.   | N | S | O | R |
| 13. Maintain meaningful and fulfilling relationships with others.                     | N | S | O | R |
| 14. Eat 6-11 servings of bread, cereal, rice and pasta each day.                      | N | S | O | R |
| 15. Question health professionals in order to understand their instructions.          | N | S | O | R |
| 16. Take part in light to moderate physical activity (such as sustained walking 30-40 | N | S | O | R |
| 17. Accept those things in my life which I can not change.                            | N | S | O | R |
| 18. Look forward to the future.   | N | S | O | R |
| 19. Spend time with close friends.  | N | S | O | R |
| 20. Eat 2-4 servings of fruit each day.   | N | S | O | R |
| 21. Get a second opinion when I question my health care provider's advice.            | N | S | O | R |
| 22. Take part in leisure-time (recreational) physical activities (such as swimming,   | N | S | O | R |
| 23. Concentrate on pleasant thoughts at bedtime.                                      | N | S | O | R |
| 24. Feel content and at peace with myself.  | N | S | O | R |
| 25. Find it easy to show concern, love and warmth to others.                          | N | S | O | R |

- |   |   |   |   |   |
|---|---|---|---|---|
| 26. Eat 3-5 servings of vegetables each day.  | N | S | O | R |
| 27. Discuss my health concerns with health professionals.                           | N | S | O | R |
| 28. Do stretching exercises at least 3 times per week.                              | N | S | O | R |
| 29. Use specific methods to control my stress.                                      | N | S | O | R |
| 30. Work toward long-term goals in my life.   | N | S | O | R |
| 31. Touch and am touched by people I care about.                                    | N | S | O | R |
| 32. Eat 2-3 servings of milk, yogurt or cheese each day.                            | N | S | O | R |
| 33. Inspect my body at least monthly for physical changes/danger signs.             | N | S | O | R |
| 34. Get exercise during usual daily activities (such as walking during lunch, using | N | S | O | R |
| 35. Balance time between work and play.   | N | S | O | R |
| 36. Find each day interesting and challenging.                                      | N | S | O | R |
| 37. Find ways to meet my needs for intimacy.  | N | S | O | R |
| 38. Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts | N | S | O | R |
| 39. Ask for information from health professionals about how to take good care of    | N | S | O | R |
| 40. Check my pulse rate when exercising.  | N | S | O | R |
| 41. Practice relaxation or meditation for 15-20 minutes daily.                      | N | S | O | R |
| 42. Am aware of what is important to me in life.                                    | N | S | O | R |

43. Get support from a network of caring people.	N	S	O	R
44. Read labels to identify nutrients, fats, and sodium content in packaged food.	N	S	O	R
45. Attend educational programs on personal health care.	N	S	O	R
46. Reach my target heart rate when exercising.	N	S	O	R
47. Pace myself to prevent tiredness.	N	S	O	R
48. Feel connected with some force greater than myself.	N	S	O	R
49. Settle conflicts with others through discussion and compromise.	N	S	O	R
50. Eat breakfast.	N	S	O	R
51. Seek guidance or counseling when necessary.	N	S	O	R
52. Expose myself to new experiences and challenges.	N	S	O	R

### Scoring Instructions

Items are scored as Never (N) = 1, Sometimes (S)= 2, Often (O) = 3, Routinely (R) = 4

A score for overall health-promoting lifestyle is obtained by calculating a mean of the individual's responses to all 52 items; six subscale scores are obtained similarly by calculating a mean of the responses to subscale items. The use of means rather than sums of scale items is recommended to retain the 1 to 4 metric of item responses and to allow meaningful comparisons of scores across subscales. The items included on each scale are as follows:

Health-Promoting Lifestyle 1 to 52

Health Responsibility 3, 9, 15, 21, 27, 33, 39, 45, 51

Physical Activity 4, 10, 16, 22, 28, 34, 40, 46

Nutrition 2, 8, 14, 20, 26, 32, 38, 44, 50

Spiritual Growth 6, 12, 18, 24, 30, 36, 42, 48, 52

Interpersonal Relations 1, 7, 13, 19, 25, 31, 37, 43, 49

Stress Management 5, 11, 17, 23, 29, 35, 41, 47

(Walker, Sechrist, & Pender, 1995).

Appendix D  
Herth Hope Index (HHI)

HERTH HOPE INDEX

Listed below are a number of statements. Read each statement and place an [X] in the box that describes how much you agree with that statement right now.

	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Agree</b>	<b>Strongly Agree</b>
1. I have a positive outlook toward life.				
2. I have short and/or long range goals.				
3. I feel all alone.				
4. I can see possibilities in the midst of difficulties.				
5. I have a faith that gives me comfort.				
6. I feel scared about my future.				
7. I can recall happy/joyful times.				
8. I have deep inner strength.				
9. I am able to give and receive caring/love.				
10. I have a sense of direction.				
11. I believe that each day has potential.				
12. I feel my life has value and worth.				

(Herth, 1989)

## SCORING INFORMATION FOR THE HERTH HOPE INDEX (HHI)

Scoring consists of summing the points for the subscale and for the total scale. Subscales are based on the three factors (see Table 2 in 1992 publication). Total possible points on the total scale is 48 points. The higher the score the higher the level of hope.

Note the following items need to be reversed scored: 3, 6. Score items as follows:

Strongly Disagree = 1

Disagree = 2

Agree = 3

Strongly Agree = 4

HHI has been translated into Brazilian, Chinese, Dutch, Filipino, French, German, Icelandic, Italian, Japanese, Korean, Norwegian, Portuguese, Slovenian, Spanish, Swedish, Tai, Turkish, Urdu.

Appendix E  
**Parkinson's Disease Quality of Life Questionnaire-8 (PDQ-8)**

Due to having Parkinson's disease, how often during the past month have you..... Please tick one box for each question

	<b>Never</b>	<b>Occasionally</b>	<b>Sometimes</b>	<b>Often</b>	<b>Always or cannot do at all</b>
1. Had difficulty getting around in public?					
2. Had difficulty dressing yourself?					
3. Felt depressed?					
4. Had problems with your close personal relationships?					
5. Had problems with your concentration, e.g. when reading or watching TV?					
6. Felt unable to communicate with people properly?					
7. Had painful muscle cramps or spasms?					
8. Felt embarrassed in public due to having Parkinson's disease					

(Jenkinson & Fitzpatrick, 2007)



## Appendix F

**Pre-Notice Study Letter**

Given to prospective participants at conference or mailed to their home; first study contact.

April 23, 2016

First Last Name  
Address  
City, State, Zip Code

Dear First Last Name,

I am writing to ask for your help with an important study investigating health-promoting behaviors, hope, and health-related quality of life experienced by persons with Parkinson's. Within the next week, you will receive another letter asking you to participate in this study. The letter will contain surveys related to your level of health-promoting behaviors, hope, and quality of life.

The reason I am writing in advance is because I want you to have time to think about participating in my study. I would like to make it an easy and enjoyable process. This study is part of my dissertation. I am a doctoral student at South Dakota State University and the study has been approved by the SDSU Nursing Research Committee and the Office of Research/Human Subjects Committee.

Please consider taking 15-20 minutes of your time to help with the study. I would like you to have the opportunity to add your perspective on health-promoting behaviors, hope and health-related quality of life.

Sincerely,

Amy K. Forbes, MS, RN  
PhD Student  
South Dakota State University

## Appendix G

**First Letter Contact**

Sent to prospective participants; second study contact

Dear First Name,

Recently you received a letter asking you to respond to study surveys regarding health-promoting behaviors, hope, and quality of life. Your response to these surveys is helpful to further understanding of these concepts in nursing practice.

The survey has several components, but should only take you about 15 to 20 minutes to complete. Please see enclosed surveys.

Everything is kept confidential in this study and no personally identifiable information will be associated with responses. Your participation is completely voluntary. Please feel free to contact me at [akpeterson1277@jacks.sdstate.edu](mailto:akpeterson1277@jacks.sdstate.edu) or my dissertation chair [Kay.Foland@sdstate.edu](mailto:Kay.Foland@sdstate.edu)

I appreciate your help in considering to complete the surveys. Thank you for participating.

Sincerely,

Amy K. Forbes, MS, RN  
PhD Student  
South Dakota State University

Dr. Kay Foland, PhD, RN, PMHNP-BC, PMHCNS-BC, CNP  
Professor  
South Dakota State University College of Nursing, West River  
Rapid City, SD

## Appendix H

**Thank You Letter Contact**

Sent to prospective study participants; third study contact

Dear First Name,

During the last week you were sent surveys regarding the concepts of health-promoting behaviors, hope, and quality of life. I hope that you have taken the time to complete the surveys. Please consider taking 15-20 minutes to complete the surveys now. I appreciate all your help for this important study.

Thanks again for your participation.

Sincerely,

Amy K. Forbes, MS, RN  
PhD Student  
South Dakota State University

## Appendix I

## Permission Emails

3/28/2016

Hi Amy:

You have my permission to use the Health Promoting Life Style II instrument or any other instruments that seem useful.

Please see attachment with Deep Blue website with the instrument and instructions.

Wishing you good health,  
Nola Pender

## Appendix J

## Permission Emails

6/17/2016

Dear Amy,

I appreciate your continued interest in the Herth Hope Index (HHI). I have attached a copy of the HHI, scoring instructions, and two reference lists I have compiled on hope primarily from the nursing discipline.

You have my permission to use the HHI in your dissertation research project exploring hope, health-promoting behaviors and HRQOL in persons with Parkinson's Disease. I ask that you send me a summary of your study findings upon completion of the project.

Best wishes in your educational journey and your important research study.

Sincerely,

Dr. Kaye Herth

Kaye A. Herth, Ph.D., R.N., F.A.A.N.

Minnesota State University, Mankato

Dean Emerita

[kaye.herth@mnsu.edu](mailto:kaye.herth@mnsu.edu)