PREDICTORS OF QUALITY OF LIFE (QOL): COMPARING BABY BOOMERS, OLDER ADULTS, AND YOUNGER ADULTS USING DATA FROM THE 2010 NATIONAL HEALTH INTERVIEW SURVEY

Helen Roult Bryce, MA, OTR/L

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APPROVED:

James H. Swan, Major Professor
Stanley R. Ingman, Committee Member
Keith Turner, Committee Member
Daniel Rodeheaver, Chair of the Department of Sociology
Thomas Evenson, Dean, College of Public Affairs and Community Service
Mark Wardell, Dean of the Toulouse Graduate School

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The purpose of this study was to identify factors that predict quality of life (QOL) for aging adults and to examine and compare Baby Boomers', Older Adults' and Younger Adults' responses to the 2010 National Health Interview Survey/QOL Functioning and Disability. Significant findings included several significant values based on the multivariate regression to estimate a model to predict QOL. In particular, being male, four ethnicities other than white, being older than Boomer, age in 10 years, the Functional Difficulty Index, the Functional Limitation Index scores, chronic heart disease, asthma, and arthritis all had significant p values. Adults with chronic heart disease, asthma, or arthritis scored lower on the QOL index, but cancer, stroke, or diabetes were not associated with the QOL index. Two hypotheses had strong support. Lower scores on both the Functional Difficulty Index and the Functional Limitation Index yielded lower QOL scores. Further research recommendations include establishing reliability and validity of the QOL index; running additional regressions for demographics (ethnicity, marital status, etc.) to predict possible combinations of variables predicting QOL or barriers to QOL; and investigating the viability of incorporating the QOL index into an electronic medical record (EMR) dashboard parameter to serve as a screening mechanism for those aging adults most at risk for chronicities or co-morbidities that place them at risk for losing their ability to age in place in the home of their choosing.

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A doctoral student's journey is often one of multiple, simultaneous, and sometimes conflicting obligations and gratifications that must be postponed or taken in smaller doses at least. I have been continually humbled by that fact that Reinhold Niebuhr was correct in saying "nothing we do…can be accomplished alone." Countless individuals have contributed to the success of the journey that culminated in this dissertation:

- My committee professors, Dr. James Swan, Dr. Stan Ingman, and Dr. Keith Turner, whose commitment to aging studies, graduate students, and the future inspired me to think, question, and act beyond my zone of comfort.
- My parents, whose sacrifice and example taught me the value of education, hard work, integrity, and paying it forward.
- The strong, older women in my life, who paved the way with their wit, wisdom, tenacity, and courage to try the unfamiliar.
- My husband and three children, who have earned honorary doctorates with me as they sacrificed often and supported me constantly with love, time, and technological support.

I am of the opinion that my life belongs to the whole community and as long as I live, it is my privilege to do for it whatever I can. I want to be thoroughly used up when I die, for the harder I work the more I live. (George Bernard Shaw)

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INTRODUCTION

Background

With the Baby Boomer (Boomers) generation formed by the post-World War II birth years from 1946 to 1964, now reaching middle to early retirement age, society will realize unprecedented demands on social services to meet the needs of those aging Boomers in addition to the those adults older than Boomers (OTB) with chronic or disabling conditions using social and medical resources. As the Boomers age, the incidence of many chronic or progressive conditions is projected to increase exponentially.

The World Health Organization (2012a) noted that in nearly every country in the world, attributable to declining fertility rates and increased life expectancy, the percentage of adults aged 60 years of age and over is growing at a rate higher than any other age group. The majority of American Baby Boomers was born between 1946 and1964 and are part of this large population of aging adults. Further, the global population of adults aged 60 and over has doubled since 1980 with numbers projected to reach 2 billion by 2050.

Boomers are not protected from acute or chronic health issues despite the likelihood of having access to health care and improved financial resources compared to their parents. Love (2012) revealed that Boomers are not too dissimilar from their parents and are generally satisfied with their lives. One aspect of difference is Boomers' expectations and desires for working past the traditional retirement age of 65 years. Love neglected to expand on the possible reality that not all Boomers may carry the physical or psychological ability to contribute to competitive work past age 65 due to issues of health, finance, caring for grandchildren, or other unforeseen circumstances. Such a change in plans for the last third of life could profoundly influence quality of life (QOL).

According to WHO (2012b), the top three causes of death in older adults in the United States are heart disease, stroke, and chronic lung disease, while the primary causes of disability include visual impairment, dementia, hearing loss, and osteoarthritis. As of 2009, the life expectancy in the United States was 79 years (WHO, 2012a). Not surprisingly, global health increases and declining fertility rates contribute to trends in population increases in the oldest of the old, those individuals aged 85 years and older. While the world's population of individuals aged 60 and older was 11% in 2006, it is expected to increase to 22% by the year 2050; the increase in adults aged 80 years and over will increase from 400 million in 1950 to a projected 400 million in 2050 (Parry, 2010). Increases in disease, multiple chronic conditions, and disability will occur in tandem with the rising U.S. life expectancy.

Older adults are heterogeneous. As such, aging is a unique experience taking shape at different rates at different ages across differing points in historical time and across different cultures. Abraham Lincoln offered this reflection on QOL and aging, "And in the end, it is not the years in your life that count; it's the life in your years." Certainly, functional abilities and disabilities of old age are not foregone conclusions, not universally experienced, or irreversible (McCabe-Sellers & Johnston, 2006). Successful aging from a health perspective means older individuals enjoy good health for a protracted period of time.

Problem Statement

Because of the unparalleled growth of the numbers of older adults in the United States and their uniquely heterogeneous nature, it is critically important that key stakeholders take stock of the characteristics of the Boomers, Elders, and Younger Adult generational cohorts, as a one-size-fits-all approach to legislation, services, and health care will not succeed. The problem is researchers and policy makers do not have a single, adequate measurement tool for addressing QOL among the Boomers, the OTB, and the younger than Boomer (YTB) cohorts. Meanwhile, QOL for these three groups may differ greatly according to their lived experiences. Research is needed to quantify and qualify those needs.

Statement of Purpose

The purpose of this study was to identify factors that predict QOL and to examine and compare Baby Boomer, OTB, and YTB responses on the 2010 National Health Interview Survey (NHIS) for QOL Functioning and Disability.

Significance of the Research

In 2010, the U.S. population over 65 years of age was 13%, larger than in any other decennial's census (Werner, 2011). According to the CDC (2012b), in 2010 the U.S. population of adults between the ages of 75 and 84 years numbered 7 million. Further, 1.9 million were age 90 years or older in 2010, and that number is expected to swell to 9 million by 2050 (Cire, 2011). In the year 2011 alone, 7,000 people turned 65 years old daily. By the year 2030, Boomers, born from 1946 to 1964, will be the younger of the old and number 61 million, and the oldest of the old, born prior to 1945, will number 9 million (Knickman & Snell, 2002).

Velkoff, He, Sengupta, and DeBarros (2006) pointed to the game-changing way Boomers will continue to define older age as they live longer, achieve higher levels of education, and experience lower rates of disability over the lifespan than prior generations. The reverberations they send through the economy, health care, housing, and social institutions will be like nothing the United States has seen before. Resources and legislation planned and enacted for Boomers will have direct and indirect repercussions for the YTB and OTB age groups and their subsequent QOL. For example, the oldest of the old likely built and bought the majority of homes erected after World War II. Now over 60 years old, those same homes may require significant repair or remodeling to accommodate aging in place safely for Boomers and YTB. Boomers may realize a shortage of right-sized housing that supports aging in place. YTB, however, may see an abundance of such housing that the Boomers will build, leaving YTB a legacy of potentially more affordable housing for the later years of life.

Other factors, such as finances, may affect generations differently. Some Boomers may anticipate a comfortable inheritance from their parents, who lived through difficult economic times. Financial advisors anticipate the largest intergenerational transfer of personal wealth over the next 20 to 30 years. Yet Boomers may see such inheritances reduced or even depleted by circumstances beyond their control or their parents' control. Situations such as catastrophic illness, legal judgments, or loss of savings from economic downturns or unfortunate investments can diminish the available future funds before they can be passed to Boomers or to YTB.

Scarcity of savings can make several aspects of QOL more difficult for any age group. One meaningful phase for many can be retirement. Some Boomers are finding, however, that they want or need to delay their retirement out of concern for affording a long retirement. This choice may compel Boomers to begin echo careers or to take jobs a few pay grades below their accustomed salaries. YTB may struggle in the job market because of the older workers' choices to continue working. YTB may achieve promotions and pay grade increases more slowly than Boomers if Boomers stay in the workforce for a longer tenure than the OTB did. Social institutions, such as higher education, may realize increased enrollment numbers across generations as adults strive to maintain competitive edges.

In addition to consideration about housing, finances, employment, retirement, and education, Boomers may feel constrained by caregiving demands across generations. While their parents and the OTB cared for grandchildren after they raised their own families, Boomers may simultaneously care for aging parents and their own children and grandchildren. Boomers may wonder if there will be adequate Medicare benefits for them, but YTB may have less anxiety about the Medicare benefit as the Boomers paid in to Social Security in greater numbers than any previous generation.

The findings from this study are timely as record numbers of adults are approaching retirement and older age. The results will inform managers, policy makers, health care providers, and social institutions by providing vital information on the distinctive needs for health care and social services and other essentials that Boomers, OTB, and YTB will require as they advance in age. Without this secondary data analysis and interpretation, leaders could squander precious resources with otherwise uninformed decisions and planning for America's graying future.

Theoretical and Conceptual Framework

This study was conducted against the backdrop of an integrated theory, that which treated the life-course perspective and the person-environment-occupation (P-E-O) theory as synthesized units. Both the life-course perspective and the P-E-O theory were adapted in their application to encompass how adults approach and move through retirement age and beyond.

Life-Course Perspective

With the influence of theoretical approaches from gerontology and occupational therapy, I began this study with the broad, overarching life-course perspective and moved through components of the P-E-O model to examine occupational performance or adaptation, one possible QOL strategy for the aging adult. The life-course perspective girded the theoretical frame for this study. Moen, Elder, and Luscher's work (1995) articulated seven major tenets of this perspective: trajectories, transitions, turning points, cultural and contextual influences, timing in lives, linked lives, and adaptive strategies. Within the cultural and contextual influences is the concept of role, which may be either constraining or providing opportunity for personal growth.

As Boomers age, they may continue to accumulate meaningful, satisfying roles, elect to release roles no longer of their choosing, or relinquish roles, forced by the death of a spouse or child, job loss, or loss of social support. Similarly, Boomers may be pressed into roles such as caregiver for an aging parent or actively-parenting grandparent to the grandchild whose parent is incarcerated or addicted to substances. Unforeseen changes in life circumstances may present roles the Boomer never dreamed of enacting nor made provisions for adopting.

How individuals cope and change in response to their environments and challenges is another focus of the life-course. When humans' appropriate or socially normed transitions, such as age when leaving education, employment, or parenthood, do not occur as expected, they can be said to exhibit a "life-course disorder" (Elder, 1995, p. 124). In older adults reaching retirement age, this disorder may manifest in events such as returning to school or starting a second family or a blended family with a new spouse. This emphasis on coping and adaptation is one that can be integrated with P-E-O theory.

Person-Environment-Occupation Theory

Scaffolding on the life-course perspective, P-E-O theory (Law et al., 1996) was included in the theoretical framework. The life-course perspective concept "goodness of fit" (Elder, 1995, p. 115) addresses how one's life and new circumstances intersect as in a Venn diagram and parallels an occupational therapy construct known as occupational performance (Figure 1). Baum and Law (1997) defined occupational performance as "the point when the person, the environment, and the occupation intersect to support the tasks, activities, and roles that define that person as an individual" (p. 281). The life-course perspective underpins the P-E-O theory in addressing how well the environment (e.g., physical access, attitudes, finances, etc.), the chosen tasks (e.g., occupations, activities), and the individual fit together for maximal occupational performance as an expression of adaptation or adaptive strategies. When the environment, illness, stress, or other factors constrain a person, then occupational performance is minimized. Stress, illness, or reduced resiliency and possible decreased QOL could be inferred.

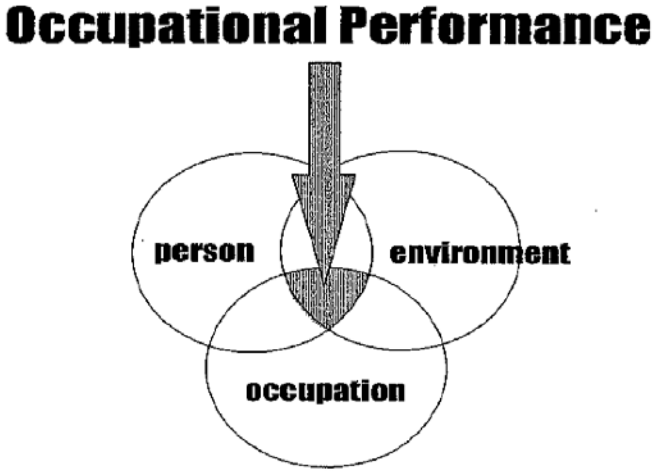

Figure 1. P-E-O relationship adapted with permission from Law et al. (1996).

Health care professionals, aging services professionals, and gerontologists alike might find the P-E-O model useful in explaining changes to occupational performance over the course of the lifespan. The P-E-O model may inform the discussion of the experience of QOL for the aging adults who participated in the 2010 NHIS as a graphic representation of how perceived QOL may increase, maintain at current levels, or decrease (Figure 2). Adults employ adaptive or maladaptive strategies and evaluate life experiences as satisfying or unsatisfying as they shape perceptions of QOL.

Figure 2 can illustrate the example of a Boomer heading into retirement who has anticipated this change and is excited about working differently. That is, this Boomer can now volunteer at the neighborhood school as promised to self over many years. Now this Boomer has the resources and health to take up golf and work out daily. The Boomer and spouse can take dance lessons before the cruise to celebrate their 40th wedding anniversary. The Boomer feels satisfied and enjoys life while experiencing optimal occupational performance. In the central portion of the illustration, this Boomer is not fully supported because the spouse has died from cancer. Retirement dreams and plans changed overnight leading to concern about finances and money management, something the spouse always did. Retirement feels lonely and without much promise.

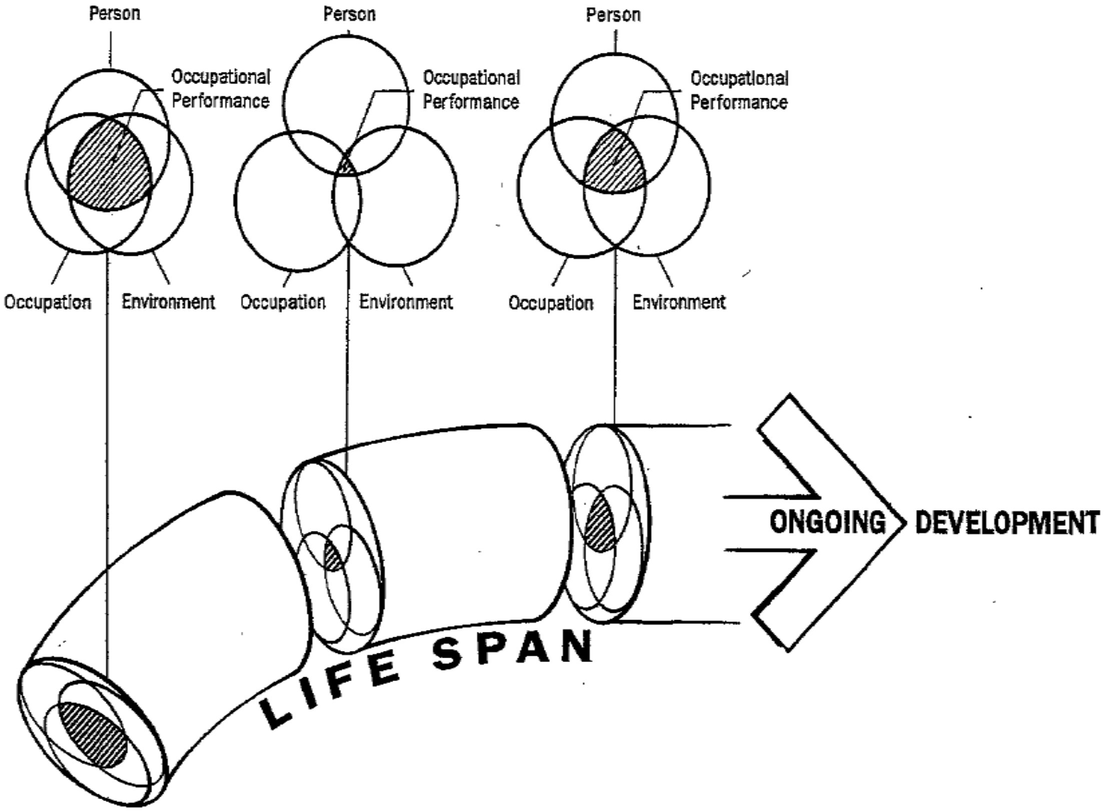

Figure 2. Changes in occupational performance over the lifespan per Law et al. (1996). Reproduced with permission from CAOT publications ACE.

In the final portion of Figure 2, the occupational performance reflects continued or resumed growth. The Boomer is learning through grief recovery and has made new friends and acquaintances in the process. While still feeling the void of some unfulfilled dreams, this Boomer is proud about taking dance lessons alone and seeking out new opportunities. The

Boomer is beginning to experience some hope for her future. This process of occupational performance waxing and waning over the lifespan can happen in many forms.

Summary

This chapter presented the background and introduction to the study, the purpose of which was to analyze variables for a model to predict QOL in American Boomers and adults OTB and YTB. Stakeholders need to be acquainted with this information to plan mindfully for the oncoming aging tsunami.

CHAPTER 2

LITERATURE REVIEW

Middle age in the United States has a certain amount of myth surrounding it. One such myth is the idea of being *over the hill* and too old to enjoy life. However, a modest body of literature articulated some of the unique needs and experiences of the middle third of life (Gerontological Society of America, 2012). Willis and Reid (1999) compiled results of research on many relevant topics to adults in middle life including health and disease, sense of control, gender roles and identity, development, and intellectual functioning. Whitbourne and Connolly (1999) discussed personality development and outlined the three identity styles of assimilative, accommodative, and balanced. Keyes and Ryff (1999) discussed psychological well-being in middle age, particularly six dimensions of well-being, operationalized with structured, self-report scales on self-acceptance, positive relation with others, autonomy, environmental mastery, purpose in life and personal growth. Well-being in middle age is a multidimensional, complex construct that is not readily quantified.

Indeed, defining when middle age begins is equally elusive. Influences such as gender, social network, and culture may suggest when this stage commences. Estimates suggest middle age arises at age 50 to the stage ranging from age 40 to 60 and from 45 to 64. These age ranges may be shifting toward higher ages as longevity increases. Age 65 may be older middle age to young old age. Age 75 will be old age, while age 85 and beyond will constitute the oldest of old age. In 2010, Boomers comprised a large portion of middle aged adults with their ages ranging from 46 to 64 years old. Adams (2004) offered a somewhat tongue-in-cheek definition of middle age as “that point in your life when you shift from seeing the future in terms of your potential and begin to see it in terms of your limitations" (p. 2) but pointed out that adults are not doomed to a negative outlook.

Recognizing that adults and older adults in particular, are not a homogenous group, it may be edifying to highlight some characteristics of Boomers, older than Boomers (OTB), and younger than Boomers (YTB). Like individuals, generations have personalities. The Pew Research Center (2010) reported about the Millennial generation and described five generations' noteworthy qualities. These are summarized in Table 1.

The oldest generation was the Greatest generation; its members were born before 1928 (age 83 and older in 2010) and fought in World War I. The Silent generation, born between 1928 and 1945 (age 65 and older in 2010), were children of the Great Depression and World War II, very civic-minded, and traditional. The Baby Boomer generation was born between 1946 and 1964 (ages 46 to 64 in 2010) and grew up in a period of economic expansion. Generation X (a.k.a., Gen X), born between 1965 and 1980 (ages 30 to 45 in 2010), was initially called the Baby Bust generation as its lower population numbers coincided with the advent of birth control pills. Gen X was described as savvy entrepreneurs with loner tendencies. Finally, the Millennial generation was born after 1980 (ages 18 to 30 in 2010) and were depicted as "confident, self-expressive, and open to change" (para. 4).

Table 1

Unique Characteristics between Generations

Millennial	Gen X	Boomer	Silent
Technology use	Technology use	Work ethic	WWII, Depression
Music, pop culture	Work ethic	Respect	Smarter
Liberal, tolerant	Conservative, traditional	Values, morals	Honest
Smarter	Smarter	Baby Boom	Work ethic
Clothes	Respect	Smarter	Values, morals

Note. Data adapted from Pew Research Center (2010, p. 12).

All four consider their generation unique as it is *smarter* than the others. The three generations age 30 and older in 2010 all value their *work ethic*. While Boomer and Silent generation members may take pride in their values and morals, they may take comfort in the knowledge that both Gen X and Millennials respect and interact well with adults they consider their elders. These very adults will be the future leaders, policy makers, and caregivers to the Boomer and Silent members reaching old age and advanced old age. As the Pew Research Center (2010) pointed out, the four generations highlighted above are at once uniquely similar and different. Not surprisingly, their values and lived experiences have distinctively shaped their perceptions of what constitutes QOL. A discussion on QOL and related terms in the literature occurs in the next section.

Literature on Quality of Life (QOL) versus Health-Related Quality of Life (HRQOL) and Well-being

QOL is a complex term that has meaning for individuals across age and culture. Professionals in the health care and aging services sector offer varying definitions of the same terms (King & Hinds, 2003). Individual adults who are aging in place offer their own description of QOL which includes the unique domains of health, housing, relationships, to name a few. Several terms may be used synonymously such as QOL, HRQOL, subjective well-being, well-being, life satisfaction, and so forth while some researchers would argue they have distinct meanings that drive how they are measured and researched.

For the purpose of informing this discussion, the U.S. Centers for Disease Control and Prevention (CDC) definitions will be reviewed. According to the CDC (2011a), HRQOL is "a broad multidimensional concept that usually includes self-reported measures of physical and mental health" (para. 4), while QOL can be described as "a broad multidimensional concept that usually includes subjective evaluations of both positive and negative aspects of life" (CDC, 2011b, para. 3). Additionally, well-being "generally includes global judgments of life satisfaction and feelings ranging from depression to joy" (CDC, 2011c, para. 1). Perhaps the distinctions occur based on the perspective of those discussed in these terms. HRQOL represents the medical term of interest for physicians and health care professionals as it is focused on patients' objective health outcomes and deficits, such as pain or limitations, even though this is a more negative approach. A more current paradigm shift to a client-centered, strengths-based view of global QOL includes aspects of well-being. Specifically, this perspective includes subjective ratings of emotional states and mental health, relationships, safety and security, relationship health, and other domains of living, a more positive approach. Some researchers design instruments that measure aspects of both physical and psychological health to arrive at adults' QOL.

Measuring QOL

As outlined above, QOL as a construct is multifactorial. The literature does not agree upon a single, unified definition or description, let alone one gold standard, for standardized measurement of QOL especially when applied to the lives of aging adults. Theorists have struggled to articulate a common metric for measuring QOL, or even for agreeing on its components. They can agree that it has to do with living *a good life*.

The World Health Organization (WHO, 1998) began work in the early 1990s to develop a QOL assessment that could be cross-culturally applicable while retaining sound psychometric properties. Joyce, Hickey, McGee, and O'Boyle (2003) took an approach from cognitive science and perception to outline the origins of the Schedule for Evaluation of Individual QOL (SEIQOL). Ventegodt, Merrick, and Anderson (2003a, 2003b, 2003c) explored the theoretical and philosophical framework for the Danish QOL Survey, the SEIQOL, QOL5, and QOL1 questionnaires to make the case for an integrative theory of QOL. Ventegodt et al. pointed to three aspects of the good life including the subjective QOL, the existential QOL, and the objective QOL with the middle, existential, piece uniting the subjective and objective components. QOL instruments may miss the richness of QOL by using a narrowly objective or medical definition, one that can be readily quantified but may miss subtle nuances of QOL. The 2010 National Health Interview Survey (NHIS) contained items across many domains, but one can argue it does not lend itself to an integrative picture of QOL in the present form.

A dilemma occurs regarding choice of variables or metric components to select for analysis from the 2010 NHIS based on the above examination. A thorough review of the literature on measuring QOL confirmed why confusion about QOL measurements exists. An overabundance of activities of daily living (ADL) measures exist to measure disability, limitation, or handicap and use WHO terminology. The Barthel Index, the Index of ADL, the Kenny Self-Care Evaluation, and the Medical Outcomes Study Physical Functioning Measure are but a few ADL assessments available to most health care practitioners for decades (McDowell & Newell, 1996). These indices measure several similar aspects of ADL such as dressing, bathing, and toileting. However, because many of these were developed in isolation before Internet communication and open access, planning of many ADL scales was not coordinated. Because of the uneven nature of ADL instrument development, defining disability and its relationship to impairment is difficult, although ADL instruments are intended to shed light on the existence or level of impairment or disability. While some scales such as the Barthel Index are used widely, they are older and their validity and reliability results are unimpressive. Further, more studies are needed to compare results between instruments for reliability and validity.

Instrumental ADL (IADL) assessments also include basic-ADL questions, calling into question whether ADL sections of scales can be applied in isolation (McDowell & Newell, 1996). IADL addresses more complex daily activities such as community mobility, money management, medication routine, meal preparation, and social role enactment as well as how much, if any, assistance is needed for participating in the activity or task. IADL scales focus more on functioning within the environment during social role performance and can more likely reveal handicap as opposed to impairment or disability. Because of the sometimes subjective nature of the data reporting, such as self-report, increased emphasis has been placed on establishing validity and reliability measures for IADL instruments, compared to older ADL scales.

I selected the seven items from the QOL section of the Sample Adult File (seeing, hearing, mobility, communication, cognition, learning, and upper body ADL) after investigating them in the literature and determining that, while not flawless, their widespread use justified their inclusion in this study as functional variables. Additionally, I picked eight items from the Adult Health Status and Limitations (AHS) section of the Sample Adult File due to their prevalence in the literature for additional, functional variables. Finally, I carefully chose from the Adult Conditions (ACN) section of the Sample Adult File six diseases or conditions for inclusion as chronic health conditions experienced in the U.S. adult population that the WHO and CDC warned are related to or result in decreased QOL, diminished independence, or increased risk of mortality.

Summary

This chapter offered a review of the literature related to characteristics and experiences of adults as they approach middle age and old age as well as characteristics and values of four generations. ADL, functional limitations and disability, and the challenges with assessment instruments developed without close attention to achieving consistent standards and definitions. Further, the terms related to aspects of QOL were defined for the purpose of this study. Finally, I offered rationale for selection of the variables explored in this study, based upon the review of the literature.

CHAPTER 3

METHODS

This study used a descriptive, cross-sectional research design to examine and compare quality of life (QOL) as reported in 2010 National Health Interview Survey (NHIS) for Baby Boomers (Boomers), this study's reference group, born between 1946 and 1964 as well as for adults older than Boomers (OTB) born in 1945 and earlier, and adults younger than Boomer (YTB) born in 1965 and later. The following research questions were answered in this study.

Research Questions

Research Question 1

What are the distributions of (a) functional abilities (sensory-motor, cognitive, and upper body ADL activities), (b) chronic conditions, and (c) functional disability difficulty by age group?

Research Hypothesis 1A. Married adults will rate their QOL higher than unmarried adults.

Research Hypothesis 1B. Females will rate their QOL higher than males.

Research Hypothesis 1C. White adults will rate their QOL higher than Hispanic, Black, Asian, or adults who identify as Other than Hispanic, Black or Asian.

Research Hypothesis 1D. Adults with higher levels of education will rate their QOL higher than adults with lower levels of education.

Research Hypothesis 1E. Boomers will rate their QOL higher than older adults or younger adults. Chi-square tests were administered for comparisons of the cross-tabulated data. Additionally multivariate analysis was conducted for functional and health samples by age group (i.e., Boomer, Older Adult, and Younger Adult; Salkind, 2008, pp. 171-172).

Research Question 2

How well do functional and health measures predict QOL?

Research Hypothesis 2A. Those with chronic illnesses will have lower QOL index scores.

Research Hypothesis 2B. Those with higher Functional Difficulty Index scores will have lower QOL index scores.

Research Hypothesis 2C. Those with higher Functional Limitation Index scores will have lower QOL index scores.

The NHIS is one of the principal data collection programs of the National Center for Health Statistics (NCHS) as part of the Centers for Disease Control and Prevention (CDC, 2012b). The annual survey is a multi-stage household probability sampling of non-institutionalized, non-incarcerated civilians living in the United States. Health survey supervisors provide oversight to the interviewers trained in NHIS survey concepts and procedures. The interviewers use computer-assisted personal interviewing (CAPI) to conduct the NHIS sampling on a continuous basis. The CAPI software allows interviewers to enter responses directly into laptop computers during the interviews. In addition, the software provides prompts to include follow up questions based on participants' responses to previous questions (CDC, 2012a).

In continuous use since 1957, the NHIS is comprised of demographic, health, and disability items for households, families, and individual adults. I used secondary data from the NHIS 2010, specifically the QOL Functioning and Disability supplement, to perform this study.

> The Quality of Life supplement was fielded as part of the 2010 NHIS Sample Adult module. Approximately one quarter of the sample adults were randomly selected to receive the Quality of Life questions. The supplement comprised one component of a larger testing effort to develop and adopt a standard set of disability questions to be used with multiple surveys. (CDC, 2012c, para. 1)

The 2010 Sample Adult File included 27,157 responses with a random sample of 6,775 adults completing the QOL supplemental questions (National Center for Health Statistics [NCHS], 2011a, 2011c). The sample for the proposed study included Baby Boomers (Boomers) born between 1946 and 1964, OTB adults born in 1945 and earlier, and YTB adults born in 1965 and later, who completed the QOL supplemental interview questions. The data for this secondary analysis were taken from three sections from the Sample Adult File, QOL, Adult Conditions (ACN), and Adult Health Status and Limitations (AHS) sections. New in 2010, the 2010 QOL supplement represented a pilot effort to develop a holistic presentation of QOL for all adults. The AHS questions embodied an effort to develop and standardize disability questions to be integrated into multiple survey efforts (NCHS, 2011a) while the ACN items captured participants' absence or presence of chronic conditions.

Variables

Variables for the study were selected after conducting a review of the literature. Functional and health variables included functional abilities (sensory-motor and cognitive abilities) and activities of daily living (ADL), chronic conditions (stroke, cancer, coronary heart disease, asthma, diabetes, and arthritis), and disability difficulties (functional mobility tasks). Anxiety, depression, pain, and tiredness served as surrogates for the dependent variable of QOL. The variables are conceptualized in Figure 3 and defined in Table 2.

Dependent Variable of QOL

The responses for frequencies of anxiety, depression, pain, and tiredness reported as experienced by respondents were recorded as a proxy for the QOL construct.

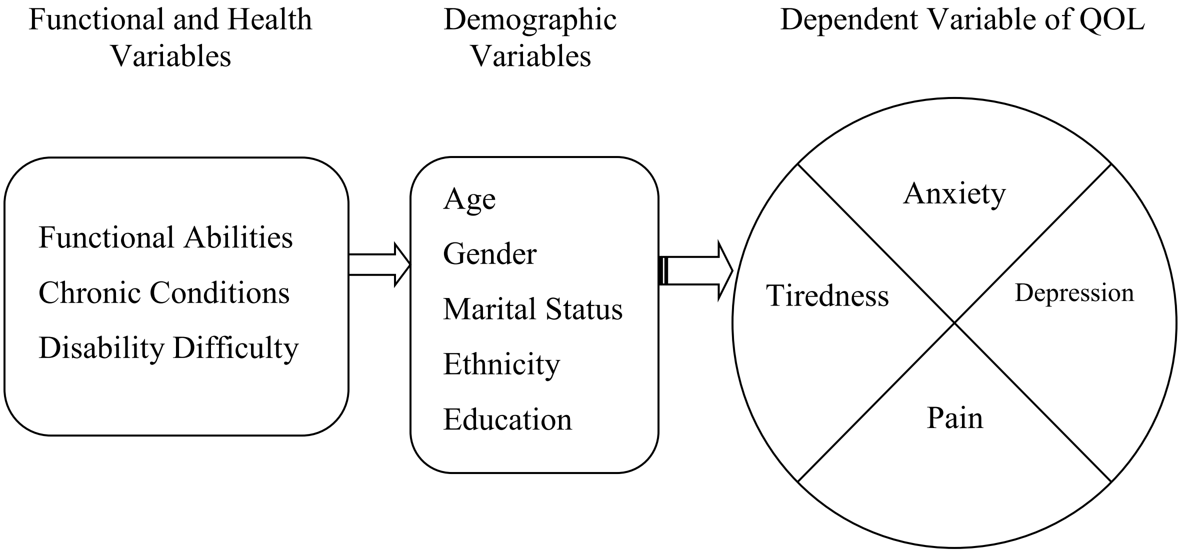

Figure 3. Conceptualization of the NHIS variables to predict QOL.

Functional and Health Variables

Variables selected as functional and health variables included functional abilities, chronic conditions, and functional disability difficulty. Functional abilities were sensory-motor abilities that included vision, hearing, mobility, communication, cognition, learning, and upper body ADL limitations. Chronic conditions described persistent health conditions that included the absence or presence of stroke, cancer, coronary heart disease, asthma, diabetes, and arthritis. Functional disability difficulty were responses about how difficult it was to walk, climb, stand, stoop, reach overhead, grasp, carry, or push/pull without special equipment.

Demographic Variables

The demographic variables of age, gender, marital status, ethnicity, and education were used in the data analysis.

Table 2

Variables Selected for Data Analysis

File	Functional and Health Variables	Dependent Variable
QOL	Functional abilities (7 items)	Quality of Life (4 items)
	Vision	Anxiety
	Hearing	Depression
	Mobility	Pain
	Communication	Tiredness
	Cognition: memory, concentration	
	Learning: new learning, comprehension	
	Upper Body; ADL limitation	
ACN	Adult Conditions (6 items)	
	Stroke	
	Cancer	
	Coronary Heart Disease	
	Asthma	
	Diabetes	
	Arthritis	
AHS	Functional disability difficulty “How difficult without special equipment to” (8 items)	
	Walk	
	Climb	
	Stand	
	Stoop, bend, kneel	
	Reach overhead	
	Grasp	
	Carry	
	Push, pull	
Total	21 items act as indicators for the Functional and Health Variables with 4 items comprise Quality of Life	

Validity

A chief problem with secondary analysis involves validity as one cannot guarantee that the purpose for which the initial researcher collected data on an item will accurately represent the variable the second researcher desires to analyze (Babbie, 2004, p. 276). Given this premise, validity for this secondary analysis could not be guaranteed.

Reliability

Reliability is one of the strengths of survey research and secondary data analysis (Babbie, 2004, p. 274). Cronbach's alpha (α) is "a special measure of reliability known as internal consistency, where the more consistently individual item scores vary with the total score on the test, the higher the value" (Salkind, 2008, p. 106). For the final measurements, the factors of functional abilities, chronic conditions, and functional disability difficulty were investigated. Reliability analysis was used with the seven items representing functional abilities, the six items representing chronic conditions, and the eight items representing functional disability difficulty. Cronbach's α was used to judge whether or not the three indicators represented viable scales.

Assumptions, Limitations, and Delimitations

I assumed the 6,775 participants comprised a random sample selected to take the 2010 QOL supplement. Baby Boomers were born between 1946 and 1964. OTBs were born in 1945 and earlier. YTB were born in 1965 and later. While the life-course perspective presumes a longitudinal study, this secondary analysis held up the lens of the life-course perspective to Boomers', OTB adults', and YTB adults' lives to obtain a picture in time of how they evaluated their QOL in the year 2010.

Data were obtained from the QOL supplement for adults, ACN section, and AHS section to the exclusion of other sections such as Adult Health Behaviors, Adult Health Care Access and Utilization, Adult AIDS, or Cancer Control Module that might have shed additional light on QOL factors and issues for adults in the age categories of OTB and YTB. Objective data were obtained from the QOL, ACN, and AHS files to the exclusion of subjective comments contained in the narrative items to facilitate manageable data analysis. Only data from the 2010 NHIS were analyzed, so findings must be applied with caution to contexts and situations beyond the scope of the 2010 NHIS. While the NHIS is a longitudinal study, assumptions about cohorts may not be made using only the results of the 2010 interview survey.

I delimited this study in two ways. First, the decision to use only the QOL, ACN, and AHS data files to the exclusion of the seven family files or the six child files limits the ability to generalize findings at the level of the Family or Child. Second, the Adult Socio-Demographic, Adult Health Behaviors, Adult Access to Health Care and Utilization, and AIDS Knowledge and Attitudes files were rejected as several of the items relating to occupational status were beyond the scope of this research study and could have contributed to an unwieldy statistical analysis.

Protection of Human Subjects

The study was a secondary analysis of data from the 2010 NHIS available in the public domain. No participants were interviewed for this study. The University of North Texas Institutional Review Board (IRB) consented for this study to take place. I did not have access to any identifying information related to this data set. Therefore, obtaining consent or release of information or outlining measures to protect individuals from harm was not required for this research project.

Data Analysis

In order to answer the research questions, I first had to address the weighting issues with the secondary data set. Then, I conducted the necessary tests to determine whether the null hypotheses would be rejected.

Weighting and Variance Estimation

The NHIS selects the sample such that each participant has a “known non-zero probability of selection” (NCHS, 2011a, p. 8). The Sample Adult data file includes two sets of weights, the Sample Adult Weight Final Annual (WTFA_SA) and the Sample Adult Weight Interim Annual (WTIA_SA)

> Sample Adult Weight – Final Annual (WTFA_SA) includes design, ration, non-response and post-stratification adjustments for sample adults. National estimates of all adult sample variables can be made using these weights. (NCHS, 2011c, p. 9)

Researchers accessing the NHIS must carefully select the appropriate software to calculate standard error estimates. For example, administering simple random sampling will usually produce standard error estimate that are too small and Type I error (NCHS, 2011d, p. 113). The NCHS recommends the use of SUDAAN® (Research Triangle Institute, 2004) software for more accurate variance estimation. Without the weighted values contained in the SUDAAN® software, one cannot conduct calculations that allow one to make estimates to the United States adult population in 2010. Based on this caveat, SUDAAN® was employed for conducting the secondary data analysis.

NCHS (2011d) detailed the survey planners' data collection methods. Because of funding reductions, the survey planners used a complex, multistage sampling technique to capture the sample of dwelling units for the NHIS. The target universe was divided into several nested levels of strata and clusters. Clustering, stratification, and oversampling of specific populations enabled the survey planners to meet the survey objectives while operating under fiscal constraints.

Logistic Regression

To test the null hypotheses, I set up a multivariate logistic regression model for predicting QOL based on the functional and health factors and the demographic variables. I estimated odds ratios and predicted likelihoods of the independent variables predicting QOL.

Summary

In this chapter, the outline for the methods was presented. Data from this secondary data analysis were obtained from the 2010 NHIS, which is available in the public domain (NCHS, 2011c). A total of 27,157 responses were provided by initial adult respondents. A random sample of 6,775 adults completing the QOL supplemental questions was drawn for this study. Descriptive statistics, cross tabulations, and multivariate regression analysis to analyze the data from the 2010 NHIS data were calculated to predict a model to estimate QOL.

CHAPTER 4

RESULTS

The purpose of this study was to identify factors that predict quality of life (QOL) in American Baby Boomers (Boomers) versus adults older than Boomers (OTB) or younger than Boomers (YTB) by using the 2010 National Health Interview Survey (NHIS) for QOL Functioning and Disability. In this chapter descriptive statistics and results from the data are presented. The SAS-Callable SUDAAN® program (version 9.2) was used to conduct the statistical analysis to determine the descriptive statistics, Cronbach's alpha (α), cross tabulations, and multivariate logistic regression analysis. Results are presented by the research questions' related hypotheses.

QOL Participant Selection and the Sample's Response Rates

In 2010, the QOL section was piloted as part of the 2010 Sample Adult Module; 27,157 adults over age 18 participated in the NHIS. Of that total, 6,775 adults (24.94%) were selected to participate in the QOL supplemental survey. Thus, 20,382 adults (75.05%) were not selected to receive the QOL portion of the survey.

The conditional adult response rate was "calculated by dividing the number of responding sample adults by the number of eligible sample adults from interviewed families" (NCHS, 2011b, p. 92). The conditional adult response rate was 77.3%. The final response rate was 60.8%. The final adult response rate was "calculated by dividing the number of responding sample adults by the number of eligible sample adults from interviewed families, and then multiplying this quotient by the final family response rate (78.7%; NCHS, 2011b, p. 92).

Descriptive Statistics

Table 3 reports frequency distributions of the sample's demographics (*n* = 6,775).

Table 3

Frequency and Percent Distribution of Unweighted Demographics in Sample of Adult 2010 QOL Survey Participants

Variables	*n*	%	Cum. *n*	Cum. %
Age				
65 and up (Boomers)	5375	79.63	5395	79.63
Younger or older than 65	1389	20.37	6775	100.00
Marital Status				
Married	3768	55.83	3768	55.83
Widowed, divorced, etc.	2981	44.17	6749	100.00
Missing *n*	26			
Gender				
Male	3757	55.45	3757	55.45
Female	3018	44.55	6775	100.00
Ethnicity				
White	3936	58.10	3936	58.10
Black	1111	16.40	5047	74.49
Hispanic	1268	18.72	6315	93.21
Asian	408	6.02	6723	99.23
Other	52	0.77	6775	100.00
Education				
Less than H.S. degree	1141	16.92	1141	16.92
H.S. degree	1794	26.60	2935	43.52
Some college	2032	30.13	4967	73.65
College degree	1777	26.35	6744	100.00
Missing *n*	31			

Table 4 reports the frequency distributions of the factors expected to constitute QOL. These factors were anxious, depressed, pain frequency, and tiredness.

Table 4

Frequencies for QOL Variables in the Sample of Adult 2010 QOL Survey Participants

Variables	*n*	%	Cum. *n*	Cum. %
Worried/Anxious/Nervous				
Daily	527	8.61	527	8.61
Weekly	710	11.60	1237	20.20
Monthly	611	9.98	1848	30.18
A few times a year	1796	29.33	3644	59.51
Never	2479	40.49	6123	100.00
Missing *n*	652			
Depressed				
Daily	273	4.47	273	4.47
Weekly	334	5.47	607	9.94
Monthly	428	7.01	1035	16.96
A few times a year	1531	25.08	2566	42.04
Never	3538	57.96	6104	100.00
Missing *n*	671			
Pain in last 3 months				
Never	2631	43.03	2631	43.03
Some days	2289	37.43	4920	80.46
Most days	486	7.95	5406	88.41
Every day	709	11.59	6115	100.00
Missing *n*	660			
Felt very tired/exhausted in past 3 months				
Never	2377	38.95	2377	38.95
Some days	3023	49.54	5400	88.50
Most days	478	7.83	5878	96.33
Every day	224	3.67	6102	100.00
Missing *n*	673			

Note. NHIS (2010) data were combined for scaling by recoding and reversing values. Once recoding was completed, items were summed to create the scale. Skip patterns might have led to artificially high missing values.

Tables 5 through 7 report the distributions of (a) functional abilities (sensory-motor, cognitive, and upper body activities of daily living [ADL]), (b) chronic conditions, and (c) functional disability difficulty.

Table 5

Frequency and Percent Distribution of Functional Abilities in Sample of Adult 2010 QOL Survey Participants

Variables	*n*	Raw % (Weighted %)	Cum. % (Weighted %)
Seeing, amount of difficulty			
No difficulty	5292	85.45 (86.60)	85.45 (86.60)
Some difficulty	778	12.56 (11.74)	98.01 (98.34)
A lot of difficulty	114	1.84 (1.55)	99.85 (99.89)
Cannot do/Unable to do	9	0.15 (0.11)	100.00 (100.00)
Missing *n*	551		
Hearing, amount of difficulty			
No difficulty	5448	88.26 (88.08)	88.26 (88.08)
Some difficulty	638	10.34 (10.52)	98.59 (98.60)
A lot of difficulty	77	1.25 (1.29)	99.84 (99.88)
Cannot do/Unable to do	10	0.16 (0.12)	100.00 (100.00)
Missing *n*	602		
Mobility, walk or climb steps			
No difficulty	4985	80.64 (82.83)	80.64 (82.83)
Some difficulty	758	12.26 (11.36)	92.90 (94.18)
A lot of difficulty	325	5.26 (4.41)	98.16 (98.59)
Cannot do/Unable to do	114	1.84 (1.41)	100.00 (100.00)
Missing *n*	593		
Communication, usual language			
No difficulty	5837	94.56 (94.81)	94.56 (94.81)
Some difficulty	294	4.76 (4.46)	99.32 (99.27)
A lot of difficulty	31	0.50 (0.62)	99.82 (99.89)
Cannot do/Unable to do	11	0.18 (0.11)	100.00 (100.00)
Missing *n*	602		

(table continues)

Table 5 *(continued).*

Variables	*n*	Raw % (Weighted %)	Cum. % (Weighted %)
Cognition, remember, concentrate			
No difficulty	5152	83.49 (83.55)	83.49 (83.55)
Some difficulty	915	14.83 (14.84)	98.31 (98.39)
A lot of difficulty	101	1.64 (1.58)	99.95 (99.97)
Cannot do/Unable to do	3	0.05 (0.03)	100.00 (100.00)
Missing *n*	604		
Self care difficulty			
No difficulty	5937	96.25 (96.76)	96.25 (96.76)
Some difficulty	175	2.84 (2.42)	99.09 (99.18)
A lot of difficulty	37	0.60 (0.60)	99.69 (99.78)
Cannot do/Unable to do	19	0.31 (0.22)	100.00 (100.00)
Missing *n*	607		
Learn, understand, follow directions			
No difficulty	5480	89.09 (89.59)	89.09 (89.59)
Some difficulty	546	8.88 (8.47)	97.79 (98.06)
A lot of difficulty	93	1.51 (1.47)	99.48 (99.53)
Cannot do/Unable to do	32	0.52 (0.47)	100.00 (100.00)
Missing *n*	624		

Scaling Functional and Health Variables

I undertook scaling to create indices for functional abilities, chronic conditions, and functional disability difficulty via Coefficient α. An α of at least 0.7 was used as the criterion for the adequacy of each scale. The seven items representing difficulty with functional abilities were assessed for their adequacy at measuring the Functional Difficulty Index. The raw Cronbach's α for the amount of difficulty seeing, hearing, climbing steps, communication, remembering, performing self care, and understanding was 0.707. Therefore, the sum of the variables for the difficulty with functional abilities was used as the Functional Difficulty Index.

Table 6

Frequency and Percent Distribution of Chronic Conditions (ACN file) in Sample of Adult 2010 Survey Participants

Variables	*n*	%	Cum. *n*	Cum. %
Coronary Heart Disease				
Yes	1331	4.90	1331	4.90
No	25766	94.88	27097	100.00
Missing *n*	60			
Stroke				
Yes	842	3.10	842	3.10
No	26284	96.70	27126	100.00
Missing *n*	31			
Asthma				
Yes	3350	12.34	3350	12.34
No	23787	87.59	27137	100.00
Missing *n*	20			
Cancer or malignancy, any kind				
Yes	2333	8.59	2333	8.59
No	24804	91.34	27137	100.00
Missing *n*	20			
Diabetes				
Yes	2772	10.21	2772	10.21
No	24009	88.41	26781	100.00
Missing *n*	16			
Arthritis				
Yes	6436	23.70	6436	23.70
No	20683	76.16	27119	100.00
Missing *n*	38			

Table 7

Frequency and Percent Distribution of Functional Disability Difficulties (AHS) in Sample of Adult 2010 Survey Participants

Variables	*n*	%	Cum. *n*	Cum. %
Walk ¼ mile				
No difficulty	21471	79.06	21471	79.06
Some difficulty	2662	9.80	24133	88.86
A lot of difficulty	895	3.30	25028	92.16
Cannot do at all/unable	2054	7.57	27082	100.00
Frequency Missing	75			
Climb 10 steps				
No difficulty	22805	83.97	22805	83.97
Some difficulty	2236	8.24	25041	92.21
A lot of difficulty	783	2.88	25824	95.09
Cannot do at all/unable	1258	4.63	27082	100.00
Frequency Missing	75			
Stand for 2 hours				
No difficulty	20823	76.68	20823	76.68
Some difficulty	284	10.48	21107	87.16
A lot of difficulty	1067	3.93	22174	91.09
Cannot do at all/unable	2332	8.59	24506	100.00
Frequency Missing	88			
Stoop, bend, or kneel				
No difficulty	19702	72.55	19702	72.55
Some difficulty	4369	16.09	24071	88.64
A lot of difficulty	1471	5.42	25542	94.06
Cannot do at all/unable	1537	5.66	27079	100.00
Frequency Missing	78			
Reach overhead				
No difficulty	24301	89.48	24301	89.48
Some difficulty	1875	6.91	26176	96.39
A lot of difficulty	500	1.84	26676	98.23
Cannot do at all/unable	404	1.49	27080	100.00
Frequency Missing	77			

(table continues)

Table 7 *(continued).*

Variables	*n*	%	Cum. *n*	Cum %
Grasp or handle small objects				
No difficulty	24517	90.28	24517	90.28
Some difficulty	1973	7.27	26490	97.55
A lot of difficulty	419	1.54	26909	99.09
Cannot do at all/unable	170	0.63	27079	100.00
Missing *n*	78			
Carry 10 pound grocery bag				
No difficulty	23370	86.06	23370	86.06
Some difficulty	1916	7.05	25286	93.11
A lot of difficulty	591	2.18	25877	95.29
Cannot do at all/unable	1200	4.42	27077	100.00
Missing *n*	80			
Push or pull large chair				
No difficulty	22005	81.03	22005	81.03
Some difficulty	2245	8.27	24250	89.30
A lot of difficulty	660	2.43	24910	91.73
Cannot do at all/unable	2161	7.95	27071	100.00
Missing *n*	86			

The six items representing chronic conditions were assessed for their ability to create a health index. The raw Cronbach's α for stroke, cancer, coronary heart disease, asthma, diabetes, and arthritis was only 0.392, and the standardized α was .441. Omitting indicators did not appreciably improve the Cronbach's α, indicating that the chronic disease condition indicators did not form a useable scale. Accordingly, the individual chronic conditions indicators were used in the multivariate analysis.

The eight items representing functional limitations were assessed as a Functional Limitation Index. The raw Cronbach's α for the variables walk, climb, stand, stoop, reach, grasp, carry, and push was 0.915. These items were summed together to form an excellent index. The sum of the functional mobility limitation variables was employed as the Functional Limitation Index.

Scaling the Dependent Variable

Anxiety, depression, pain, and tiredness were conceptualized as constituting QOL for this study. Their indicators were assessed for their adequacy for forming a QOL index. Because the indicators for anxiety and depression had different answer categories than did those of pain and tiredness, the standardized Cronbach's α was considered. The standardized Cronbach's α for anxiety, depression, pain, and tiredness was 0.756, indicating that these four indictors for QOL formed an adequate QOL index. The indicators for QOL were first standardized then summed.

Multivariate Analysis

I estimated a multivariate regression model for predicting QOL. Because of the multistep cluster sampling and weighting to the U.S. adult population, SAS-Callable SUDAAN® was employed to estimate the regression equation. The QOL Index was regressed on the Functional Disability Difficulty Index, the Functional Limitation Index, the chronic illness indicators, and the demographic variables. Table 8 reports the resulting estimates.

Results for Research Hypotheses

The status of each research hypothesis is addressed below. Table 9 provides a summary of the status of each hypothesis following the data analysis.

Research Hypothesis 1A. Married adults will rate their QOL higher than unmarried adults. The hypothesis was not supported. Married adults were not shown to differ from unmarried adults on the QOL index.

Research Hypothesis 1B. Females will rate their QOL higher than males. The hypothesis was strongly rejected. Males showed significantly higher QOL scores than did females.

Research Hypothesis 1C. White adults will rate their QOL higher than Hispanic, Black, Asian, or adults who identify as other than Hispanic, Black, or Asian. The hypothesis was rejected. All other groups showed higher QOL Index scores than Whites.

Research Hypothesis 1D. Adults with higher levels of education will rate their QOL higher than adults lower levels of education. The hypothesis was not supported. Those with college degrees were not shown to differ from those with only some college. Those with some college did not to differ from those with only high school degrees, and those with high school degrees did not to differ from those with less education.

Research Hypothesis 1E. Boomers will rate their QOL higher than adults OTB or YTB. The hypothesis was strongly rejected. Boomers were not shown to differ from younger adults, while older adults showed significantly higher QOL Index scores than Boomers. Further, the separate variable for years of age showed higher QOL scores as respondents aged. Specifically, for every 10-year increase in age, the secondary data analysis revealed an increased QOL score.

Research Hypothesis 2A. Those with chronic illnesses will have lower QOL Index Scores. The hypothesis was partially supported. Those who had been diagnosed with chronic heart disease, asthma, and arthritis demonstrated much lower scores on the QOL Index than those adults not diagnosed with those chronic diseases. However, cancer, stroke, and diabetes demonstrated no association with the QOL index.

Research Hypothesis 2B. Those with higher Functional Difficulty Index scores will have lower QOL Index scores. The hypothesis was strongly supported. Higher scores on the Functional Difficulty Index (reported difficulty with functional abilities of vision, hearing, mobility, communication, cognition, learning, and upper body ADL) were estimated strongly to predict lower scores on the QOL Index (slope = -4.23).

Table 8

Multivariate Regression on the Functional Disability Difficulty Index, Functional Limitation Index, Chronic Conditions, and Demographic Variables to Estimate a Model for Predicting QOL

Functional and Health Variables			95% Confidence Interval			
	β	SE β	Lower β	Upper β	*t*	*p*
Intercept	3.84	0.41	3.03	4.66	9.29	0.00*
Functional Disability Difficulty Index	-4.23	0.31	-4.84	-3.61	-13.55	0.00*
Functional Limitation Index	-0.77	0.09	-0.95	-0.59	-8.58	0.00*
Married	0.13	0.07	-0.01	0.28	1.77	0.07
Gender (Male)	0.63	0.08	0.48	0.78	8.40	0.00*
Hispanic	0.81	0.11	0.59	1.03	7.31	0.00*
Black	0.75	0.12	0.51	0.98	6.27	0.00*
Asian	0.87	0.16	0.55	1.19	5.39	0.00*
Other Than Black Hispanic White	0.97	0.35	0.28	1.65	2.75	0.01*
High School At Least	-0.06	0.13	-0.32	0.20	-0.45	0.65
Some College	0.06	0.11	-0.15	0.26	0.54	0.59
College Degree	0.09	0.10	-0.11	0.29	0.91	0.36
Stroke, Ever Told You Had	0.31	0.30	-0.28	0.90	1.03	0.30
Cancer, Ever Told You Had	-0.25	0.16	-0.56	0.05	-1.62	0.11
Coronary Heart Disease, Ever Told You Had	-0.66	0.22	-1.09	-0.23	-3.02	0.00*
Asthma, Ever Told You Had	-0.68	0.12	-0.92	-0.44	-5.65	0.00*
Diabetes, Ever Told You Had	-0.16	0.10	-0.37	0.05	-1.53	0.12
Arthritis, Ever Told You Had	-1.03	0.12	-1.26	-0.81	-8.95	0.00*
Younger Than Boomer	0.12	0.15	-0.17	0.42	0.83	0.41
Older Than Boomer	1.27	0.17	0.94	1.60	7.60	0.00*
Age in 10 Years	0.15	0.06	0.04	0.27	2.67	0.01*

Note. Sample n = 6,775, with number of observations used in the analysis = 5,967 and weighted count = 203,075,572. Multiple R^2 = .328. * indicates statistical significance.

Research Hypothesis 2C. Those with higher Functional Limitation Index scores will have lower QOL Index Scores. The hypothesis was supported. Higher scores on the Functional Limitations Index (i.e., walk, climb, stand, stoop, reach overhead, grasp, carry, or push/pull without special equipment) were estimated to predict lower scores on the QOL Index (slope = -0.77).

Table 9

Summary of Research Hypotheses and Evidence Based on Multivariate Regression

Research Hypothesis	Strongly Supported	Supported	Partially Supported	Unsupported	Rejected	Strongly Rejected
1A				X		
1B						X
1C					X	
1D				X		
1E						X
2A			X			
2B	X					
2C	X					

Note. Hypotheses related to research question 1 did not have support or were rejected or strongly rejected while hypotheses related to research question 2 were partially supported or strongly supported.

Summary

This chapter discussed the descriptive statistics used to analyze the responses of Boomers, adults OTB, and adults YTB to items characterizing functional ability and health on the 2010 NHIS. Multivariate analysis was engaged to estimate a model to predict QOL for Boomers and other adults. Cronbach's α was used to confirm the scaling of variables for three indices. A evidence for accepting or rejecting each hypothesis was presented.

CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

The catalyst for this study was the realization that policy makers, aging services managers, and researchers have no single agreed upon gold standard for assessing QOL among the increasingly diverse aging American adults, whose numbers are increasing at unprecedented rates. The purpose of this study was to identify factors that predict quality of life (QOL) in American Baby Boomers (Boomers) versus adults older than Boomers (OTB) or younger than Boomers (YTB) by using the 2010 National Health Interview Survey (NHIS) for QOL Functioning and Disability. Although I did not aim to identify interventions for improving QOL for Boomers (the current and future young of the old), older adults (the future oldest of the old), or younger adults (the upcoming middle age and young of the old), in the secondary analysis, I explored responses and trends that will have implications for planning, programming, and implementing policy related to health and human services, income, housing, disability and supporting age-friendly communities for adults aging in America. In this chapter, I discuss the findings, practice and policy implications, and recommendations for further research.

Discussion of the Findings

Significant findings included several significant values based on the multivariate regression to estimate a model to predict QOL (Table 6). In particular, male, all four ethnicities other than White, being OTB, age in 10 years, the Functional Difficulty Index, the Functional Limitation Index, chronic heart disease, asthma, and arthritis demonstrated significant *p* values for predicting QOL.

One surprising finding was that adults with chronic heart disease, asthma, or arthritis scored lower on the QOL index, but adults with cancer, stroke, or diabetes did not show an association with the QOL index. Perhaps cultural forces or denial were at play with the respondents who were diagnosed with cancer, stroke, and diabetes. If an adult or older adult does not acknowledge the chronic conditions or make the recommended lifestyle changes, then the adult's QOL rating likely will not suffer. This finding presents an interesting challenge for health providers and policy makers about the dilemma of how to treat adults who do not concede that their medical conditions do not influence their health landscapes. Two hypotheses had strong support. Lower scores on both the Functional Difficulty Index and the Functional Limitation Index yielded lower QOL scores. While not unexpected, the finding suggests that adults' physical difficulties that can compound with age.

Practice and Policy Implications

Intervention directed at breaking older adults' cycles of pain, anxiety, depression, and tiredness (the variables forming the surrogate for QOL) is a necessary first step. This intervention in the form of Medicaid and Administration on Aging funded home and community based services and programming can be used to address functional change in the lives of older adults as they continue to age. Such services can form a positive support for aging adults who wish to stay as active as their conditions allow them to be. Funding for these programs becomes more critical to support successful and active aging for individuals who are less adaptive.

Generation X and Millennial generation members are naturally inclined to respecting their elders and can be trained to help provide services to older generations. Boomers and adults YTB can participate in prevention and education programs to increase their knowledge of how to avoid or manage the chronic conditions known to interfere with QOL over the life-course. Policy can be enacted to complement resources, avoid waste and service duplication, and serve as many aging adults as possible. Practice and policy advocacy cannot move forward without a theoretical or philosophical compass. QOL and its definition can be approached from many angles. Similarly, aging can be viewed from more than one perspective. Some discussions in the literature point to productive aging, a term attributed to Robert Butler in 1983 and offered as a balanced perspective of the capabilities and potential of older adults versus the stereotypes that include older adults as frail, deserving, or poor.

While productive aging could imply one may be contributing economically through paid employment or volunteerism, one aim is to foster appreciation for the wisdom and lifelong contributions of older adults to their communities. Another term, successful aging "can be depicted as living both healthy and active, involved lives" (Moen, Dempster-McClain, & Williams, 1992, p. 1633). Research points to the relationship between social role enactment in the form of paid employment, volunteering, or participating in clubs and good health. A more recent term appearing in the literature is active aging.

Active aging represents a "process of optimizing opportunities for health, participation, and security in order to enhance quality of life as people age. It applies to both individuals and population groups" (WHO, 2012, para. 1). The active aging perspective emphasizes potential, participation, protection, security, and care when they are needed. Policy using the active aging view can be used to preserve autonomy and independence. Because active aging takes place in context, "interdependence as well as intergenerational solidarity are important tenets of active aging" (WHO, 2012, para. 5). Active aging does not benefit Boomer or adults OTB to the exclusion of community members' ability to benefit. The same qualities that make a community more livable or aging friendly are the same ones that support a parent pushing a young child in a stroller over an inclined curb or a person with visual impairment using an adaptive cane to palpate the raised bumps in the sidewalk for determining proximity to traffic.

The construct of active aging may fit well in the integrated theoretical framework that fuses components of the life-course perspective and the person-environment-occupation (P-E-O) theory when considering planning policy, practice, and services for the aging Boomer. The *sweet spot* that occupies the maximized occupational performance, represented in the center of the P-E-O Figures 1 and 2, could be those active aging centric community and environmental supports planned to help all citizens, especially older adults, age in place in the home or neighborhood of their choosing. Like the life-course perspective, the context of active aging does not occur in a vacuum but over an extended number of years. The active aging construct may have promise for those adults with the severely disabling conditions more likely to be experienced by the oldest of the old who may have frailty syndrome and may express their personhood through more reflective activities such as life review, reading spiritual or scared texts, or other activities and tasks that, on the surface, may appear to be less than active to an uninformed observer.

WHO's active aging mindset or philosophy advocates for preserved autonomy with supports and protections, and this way of thinking about how individuals, organizations, and institutions help older adults age with good QOL may well supplant other models as a principal theory for analyzing QOL in the lives of older adults. Whether highly active physically and mentally or more satisfied with a state of being versus constantly being in a state of doing, active aging seems to provide a viable avenue for social and other domains of health.

Limitations of the Study

An examination of the study would not be complete without consideration of its limitations. First, having access to a data set is an advantage, but the inability to add variables or items after the fact is a notable disadvantage. For example, social support is related to positive physical and mental health (CDC, 2011c; Moen et al., 1992), but social support is not present in the 2010 NHIS data set.

Second, imputing loss using any of the existing survey items regarding QOL is not possible. While the NHIS includes vast array of important items, it lack the ability to capture episodic or cumulative loss that occurs in many older adults' lives and could be considered part of aging adults' life-course progression.

Third, not unlike some ADL scales discussed in this study, it seems that NHIS item designers could have given more consideration to the psychometrics of items to eliminate or mitigate the need to recode and reverse values before items could be summed to create scales. Fourth, the objective, but medical and sometimes negative or deficit-centered, focus in some 2010 NHIS items seemed inconsistent with what was intended to be a holistic approach to QOL in the survey. A more holistic social and person-centered orientation to the item construction would be favored. Fifth, because data were taken only from the NHIS 2010 survey, distinguishing cohorts from age categories was not possible and limited the generalizability of the findings. Obtaining more years of data was possible, but I did not select this methodology.

Sixth, the perception of QOL is culturally varied and culture-bound. The items in the survey may not be representative of the cultures of some participants. With the U.S. aging population growing increasingly diverse, as evidenced by the latest Census, assuring several items are culture-free is recommended for future iterations of the survey. Seventh, the interview survey is by its nature self-report. The reliability of the participants influences the accuracy of the data and so must be acknowledged with the findings.

As the final limitation, the items may not have captured the experiences of those Boomers or adults OTB who reported good QOL despite disability or functional ability. Differences could have been due to a different cultural or spiritual experiences or expectations about QOL. A more sophisticated statistical analysis might have been able to tease out more information about that relationship. A different theoretical lens, such as one from positive psychology or one that taps in to the literature on resilience, might have been a better fit for the research design. These issues could be addressed during further research using NHIS.

Recommendations for Further Research

For the finding that for every additional 10-year increase in age, older adults' QOL Index score increases; therefore, one research opportunity may involve exploring a positive QOL cycle. Increased social support may decrease pain which may decrease depression, anxiety, and tiredness, all of which may facilitate increased social participation and allow for tapping into social supports to improve QOL. Additionally, further research into the QOL Index could establish the reliability and validity of items on the anxiety, depression, and pain, tiredness (i.e., the ADaPT Index). A third research option is to investigate the roles of wisdom, resiliency, choice of attitude, and hope in determining how older adults perceive QOL. For Boomers and younger generations who can expect to experience increased longevity and potentially increased health, if they can keep chronic conditions such as heart disease and diabetes at bay, the path to a quality life over the lifespan may be worth the investment to learn how it is done.

APPENDIX A

FUNCTIONAL AND HEALTH VARIABLES’ QUESTION ID, VARIABLE NAMES, AND QUESTION TEXT FOR THE SAMPLE ADULT FILE

Question ID	Variable Name	Question Text
QOL.100_00.000	VIS_SS	Do you have difficulty seeing, even when wearing glasses?
QOL.150_00.000	HEAR_SS	Do you have difficulty hearing, even when using a hearing aid?
QOL.180_00.000	MOB_SS	Do you have difficulty walking or climbing steps?
QOL.270_00.000	COM_SS	Using your usual language, do you have difficulty communicating, for example understanding or being understood?
QOL.300_00.000	COG_SS	Do you have difficulty remembering or concentrating?
QOL.360_00.000	UB_SS	Do you have difficulty with self care, such as washing all over or dressing?
QOL.400_00.000	LEARN_2	Do you have difficulty understanding and following instructions for example, to use a cell phone or get to new place?
ACN.031_01.000	CHDEV	Have you ever been told by a doctor or other health professional that you had Coronary Heart Disease?
ACN.031_05.000	STREV	Have you ever been told by a doctor or other health professional that you had a Stroke?
ACN.080_00.000	AASMEV	Have you ever been told by a doctor or other health professional that you had Asthma?
ACN.130_00.000	CANEV	Have you ever been told by a doctor or other health professional that you had Cancer or malignancy of any kind?
ACN.160_00.000	DIBEV	Have you ever been told by a doctor or other health professional that you have Diabetes/sugar diabetes?

Question ID	Variable Name	Question Text
ACN.290_00.000	ARTH	Have you ever been told by a doctor or other health professional that you have Arthritis or other Rheumatic disorder (RA, gout, lupus, or fibromyalgia)?
AHS.091_01.000	FLWALK	By yourself, and without using special equipment, how difficult is it for you to Walk a quarter of a mile – about 3 city blocks?
AHS.091_02.000	FLCLIMB	By yourself, and without using special equipment, how difficult is it for you to Walk up 10 steps without resting?
AHS.091_03.000	FLSTAND	By yourself, and without using special equipment, how difficult is it for you to Stand or be on your feet for about 2 hours?
AHS.091_05.000	FLSTOOP	By yourself, and without using special equipment, how difficult is it for you to Stoop, bend, or kneel?
AHS.091_06.000	FLREACH	By yourself, and without using special equipment, how difficult is it for you to Reach up over your head?
AHS.141_01.000	FLGRASP	By yourself, and without using special equipment, how difficult is it for you to Use fingers to grasp or handle small objects?
AHS.141_02.000	FLCARRY	By yourself, and without using special equipment, how difficult is it for you to Lift or carry something as heavy as 10 pounds such as a full bag of groceries?
AHS.141_03.000	FLPUSH	By yourself, and without using special equipment, how difficult is it for you to Pull or push large objects like a living room chair?

APPENDIX B

DEPENDENT VARIABLES’ QUESTION ID, VARIABLE NAMES, AND QUESTION TEXT FOR THE SAMPLE ADULT FILE

Question ID	Variable Name	Question Text
QOL.410_00.000	ANX_1	How often do you feel worried, nervous or anxious? Would you say daily, weekly, monthly, a few times a year, or never?
QOL.450_00.000	DEP_1	How often do you feel depressed? Would you say daily, weekly, monthly, a few times a year, or never?
QOL.500_00.000	PAIN_2	In past 3 months, how often did you have pain? Would you say never, some days, most days, or every day?
QOL.540_00.000	TIRED_1	In past 3 months, how often feel very tired or exhausted? Would you say never, some days, most days, or every day?

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