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The Importance of Understanding Functionality in Home- and Community-Based Care and the Impact on Costs as America Ages

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This is to certify that the doctoral dissertation by

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Abstract

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Shannon Scott Stanley

MA, American Public University, 2012

BS, Louisiana College, 2010

Dissertation Submitted in Partial Fulfillment

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Abstract

The United States is on a trajectory to reach 20% of citizens aged 65 and over by 2030. This hyper-aging population affects the costs of healthcare, but it is not adequately represented in current U.S. models. Studies indicate other hyper-aged nations have experienced this increase and implemented long-term care measures to counter the increase in aging populations and costs with system responsiveness. This study examined the role of Medicaid home -and community- based service (HCBS) contributions in states that have the fastest-aging populations. Using the established framework and data collected by the Centers for Medicare and Medicaid, the study looked for whether activities of daily living (ADL) and instrumental activities of daily living (IDAL) were statistically significantly associated with average costs per Medicaid 1915(c) aged recipient in Alaska, Nevada, and Utah, the highest hyper-aging states, which is defined as those with over a 20% increase in age 65 and over from 2000-2010. These states also had to have an established qualifying Medicaid 1915 (c) program. Using a total sample of 267 recipients equally distributed for Alaska, Nevada, and Utah, ADL and IADL were examined with overall average cost per recipient. The findings indicated positive correlations between ADL and IADL and costs in hyper-aging states. However, a single strong predictor variable could not be identified. The results offer insights into future utilization of ADL and IADL in HCBS study. The findings can be used by researchers to help identify significant predictors that can improve the costs associated with the long-term care of the elderly as the United States reaches hyper-aged status in 2030 and Medicaid HCBS use continues to grow.

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Dedication

This dissertation is dedicated to my family. First, to my mother, Carolyn, who taught me to reach for things that cannot be seen. The values she instilled encourages me to believe that it does not matter where I came from, what resources that I may or may not have that others do, and that my origins of humble beginnings in the small town of Glenmora, Louisiana had no influence on where I would go in life. She reminded me I would positively impact and encourage people along the way. Equally as important, she reminds me to never abandon the principles that I stand upon that propel me to reach further than my immediate surroundings.

To my father, Moses, thank you for teaching me your jovial spirit and to look out for those who cannot look out for themselves. It is my hope that the kindness you taught me is exemplified in these words as they echo a call for action for those who are vulnerable and in need of help. Your wisdom goes beyond worldly measurements for intellectualism. I remember those talks with you as a child sitting in the Huey P. Long state hospital with many others who were desperately trying to access quality healthcare. This is for you.

Most importantly, you both reminded me that as much as I want to, I don't have to save the world because Jesus Christ has already done that. You encouraged me to work hard and that eventually, the fruits of my labor would blossom and that the results will come. The emphasis on education that you both instilled in me helped me to balance my thoughts as a scientist with those of a faithful believer in things we cannot quantify or measure. This work is the product of your belief system and it has had such a positive

impact on the world and it continues to be a hope to all those who aspire to chase their dreams, as long as I still have breath. Doctors come from all backgrounds and walks of life. I’m happy you both got to see this through. Selah.

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upholding the oaths they took, at times only for the satisfaction they receive from of helping someone else, you are in these words, thank you.

Thank you, God, for blessing me with these people, let my words go forth to inspire and motivate, to heal and proclaim that you reign, and we are Your children. Give us the strength to be bold in these dark times, lighten our paths, and renew our souls, glory to you, forever.

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Chapter 1: Introduction to the Study

Hyper-aging in American society and dynamic long-term care reform necessitate discussion about the number of elderly and the societal costs incurred from this growing population. Societies that consist of 20% or more individuals aged 65 and over are defined as hyper-aged populations (Kudo, Mutisya, & Nagao, 2015). The U.S. Census Bureau projects the United States will reach this status by the year 2030. This will be the largest percentage of elderly in the general population of the U.S. in history. Home- and community-based services (HCBSs) provide support for the care of this group. However, research of activities of daily living (ADL) and instrumental activities of daily living (IADL) in HCBSs in states with hyper-aging populations remains limited (Pruchno, 2015). Use of HCBSs has increased programmatic costs in the United States since the 1980s (Fields & Dabelko-Schoeny, 2016). This modern demand, facilitated by natural aging, has garnered a lack of research on the costliest functional indicators in states that have seen the most rapid percentage increase in the age 65-plus population.

Understanding states with hyper-aging populations that use home- and community-based Medicaid waivers can improve quality of care planning and treatment and controllable environmental outcomes in home- and community-based care (Bohl, Finucane, Ross, Wang, & Ayele, 2015; Centers for Medicare and Medicaid Services [CMS], 2014; Muntinga, Van Leeuwen, Schellevis, Nijpels, & Jansen, 2015; Wysocki et al., 2015). HCBSs lower costs to society and enhance recipient quality of life (Auerswald, 2015; Guo, Konetzka, Magett, & Dale, 2015; Kane & Cutler, 2015). According to the CMS (2014), overall Medicaid spending on home- and community-based care was 23% higher than any other type of long-term care, and in 2016 a total of

$80.6 billion was spent on these programs. While total spending has increased, research on ADL and IADL remains limited in states with the fastest growing older population. The U.S. long-run model for elder care focuses largely on short-term cost reduction. Kuhlmann, Blank, Bourgeault, and Wendt (2015) noted that increased costs in home- and community-based care have occurred particularly with elder long-term care, and costs continue to grow with increased reliance on HCBSs by recipients. A lack of cost research in states with hyper-aging populations that contain Medicaid HCBS recipients may contribute to a decrease in well-being in recipients, degraded efficacy for stakeholders, and increased total costs paid by society (Segelman et al., 2017).

This study affects positive social change in states with hyper-aging populations by associating the most significant functional identifiers with costs. Research specific to states with hyper-aging populations that use home- and community-based care to assist with ADL and IADL in the United States promotes a common criterion by identifying the services that may enhance functionality while mitigating cost. Results also have implications in younger cohorts by promoting awareness in future care planning and coordination of preventative measures. The research findings refocus the theoretical lens of viewing home- and community-living frameworks as a cost-effective tool in long-term elder care (Doty, 2015). This is done by associating functionality identifiers with costs in the fastest-aging states, specifically in aging populations. The past criteria for the assessment of older adults emphasized economic aspects of aging that included baseline additional years of life. Since the 1970s, researchers have emphasized home- and community-based care as having increased value in the assessment and treatment process.

Background of the Study

During the 1961 White House Conference on Aging, a joint effort by the Kennedy administration and the 87th Congress, the nation recognized a need for elder care policies that improved access and quality in long-term care services and support, such as home- and community-based care (Fredriksen-Goldsen & Hooyman, 2007). The definition of effectiveness in public policy has changed, but its roots can be found in primary goods theory, where demand of quality services from societal institutions is derived from rational individuals (Rawls, 1971). Theoretically, Medicaid aged waivers improve quality of life in vulnerable populations by assisting with ADL and IADL and allowing recipients the option of remaining in noninstitutionalized care. However, the fragmented and politically polarized landscape of the elder care continuum in modern American public policy has emphasized short-term budget needs over long-term indicators of success. Functional identifiers such as ADL and IADL in home- and community-based care that are specific to states with hyper-aging populations aid in future regulatory efforts as substantial programmatic growth continues in states expanding usage and changing eligibility criteria. While spending has continued to increase overall in the last decade on aging waivers (U.S. Department of Health and Human Services, Administration for Community Living, Administration on Aging [AoA], 2018), research on cost per recipient found in states with hyper-aging populations in the United States remained stagnant.

HCBSs are defined as care services and support that allow the elderly and persons with disabilities to remain in their homes throughout most of the care process. These

persons are limited in their functional or cognitive abilities and need assistance with their ADL and IADL. In 2012, the United States Census Bureau reported that 13.6% of the population is aged 65 and older and as much as 10% of the population in 2050 will be age 90 or over, as the states moved toward a national hyper-aged status. Developing and implementing normalized measures in home- and community-based care is now a top priority of both public and private stakeholders.

More recently, the White House Conference on Aging was held July 15, 2015 and the need for formally updated standards to meet the demands of a changing demographic was discussed. Proposals to modernize federal rules that affect long-term care and elder justice were made by the CMS (O'Neill & Pruchno, 2015). The updates would be the first of their kind to be implemented in over 25 years and included enhanced quality for stakeholders. The White House Conference on Aging stated the need to bring "regulatory requirements into closer alignment with current professional standards." Standardization of measures for both public and private sectors had become a national agenda priority.

Experts agreed that the United States will become a hyper-aged population, with one in five adults aged 65 and over by 2030 (Kudo et al., 2015). Demographic explanations for the increasing aging population are debatable, but generally accepted reasons of the age dynamics in the U.S. are lower fertility rates and mass longevity. Baby boomers born from 1946 to 1964 account for the changing structure of the age dynamic in the United States and the relative larger number of older cohorts. Shrinking younger cohorts in the general population affect the increasing aging cohorts as fertility rates per woman have decreased from 2.1 births in 2008 to 1.9 births in 2015 (United Nations,

2015). The World Bank reported that during 2000–2015, the average age of life expectancy at birth rose from 76.6 to 79.2. Increased average age at birth and technological advances in modern medicine both contribute to the current revolution of mass longevity.

Older adults can be assessed using the current framework but research emphasizing hyper-aging populations exists mostly in societies that have already experienced the phenomena, such as Japan (Yong, Minagawa, & Saito, 2015). The 2030 problem is identified in the literature as the calendar year when the United States will become hyper-aged due to mass longevity, retiring baby boomers, and increased demand for health care resources. This will collectively place an unprecedented strain on the U.S. health care system (Goldberg, & Atkins, 2013; Munnell, 2015). Functional identifiers found specifically in states with hyper-aging populations must become a fundamental part of the literature body on aging populations in the United States. Today, however, it remains an underrepresented area in the literature.

After reviewing the data to determine states with the largest concentrations of elderly populations, I selected Alaska, Nevada, and Utah because they met both variable qualifiers: (a) they had a Medicaid 1915(c) program that met the minimum standards of data reporting to enable research on ADL and IADL in these populations, and (b) they contained the highest percentage of increase in age 65 and over when compared to the general population and other age cohorts, over the last 10 years. These variable qualifiers ensured the study would be relevant to current literature. Further, additional research in the Medicaid Analytic eXtract (MAX) indicated the selected states also ranked nationally

in the top 10 states that contained the highest number of beneficiaries. Each state contained beneficiaries that received over 75% of long-term services and supports through home- and community-based care. The literature review then focused on discovering common themes in the ADL and IADL functional identifiers, which will be discussed in Chapter 2.

Medicaid HCBSs make up the largest percentage of managed long-term services and supports in the United States. Hyper-aging populations increase demand for HCBSs. These events highlight the failure of social institutions and research studies to promote a theoretical framework for common functional indicators found in states with hyper-aging populations to ensure proper levels of cost. Therefore, ADL and IADL is a valuable assessment that will improve functionality and benefit positive social change by understanding predictor variables and their effect on the overall cost per recipient in society. A quantitative research design using regression analysis identified the associations of ADL, IADL, and cost per recipient found specifically in states with hyper-aging populations; the methodology is discussed in detail in Chapter 3.

Problem Statement

The AoA (2018) released a list of the fastest-aging states with the top three averaging an increase of 58.7% in individuals aged over 65 years. Despite hyper-aging in the United States, efforts to assess functionality and programmatic costs in HCBSs remain idle. The problem this study addressed is the absence of functional assessment and costs specific to states with hyper-aging populations with a Medicaid 1915(c) HCBS program. While the literature contains some indicators of well-being in HCBSs, it is

unclear which factors are most significant to individual functionality and costs per recipient. Specifically, the problem highlights the lack of research on statistical significance of ADL, IADL, and cost per recipient in the Medicaid 1915(c) HCBS aged waiver program in the fastest-aging states. The consequences of not associating these impediments with the most cost-effective services will be harm to future vulnerable populations who need these services.

Even with the emergence of a hyper-aged nation by 2030, there are few recognizable standards that associate the most significant ADL and IADL limitations found in U.S. HCBS recipients with costs. The growth of the over 65 years old demographic has become a public and private concern due to societal costs associated with the care and treatment of the elderly in the 30 states that will reach a hyper-aged status by 2030. Lack of knowledge by the public on universal indicators of functional limitations found in states with hyper-aging populations and its effect on cost erodes the creative environment for uniform criteria.

Nature of the Study

This study used a quantitative, nonexperimental, regression analysis in the research design. I collected data gathered from the CMS regarding Medicaid 1915(c) waiver recipients in Alaska, Nevada, and Utah. This did not include applicants, only actual recipients of Medicaid. Further methodological rationale is found in Chapter 3. The aim of the study was to determine which ADL and IADL limitations in HCBSs are most significantly associated with cost per Medicaid 1915(c) aged waiver recipient in states with hyper-aging populations. I combined the Katz ADL Scale, Lawton IADL

Scale, and demographic statistics from the representative sample to quantify data. I used explanatory statistics that described variables to analyze the results of the data collection as they offered an efficient research design. Demographic determinants helped explain the impact of population makeup on ADL and IADL and costs in hyper-aging states. I used Cronbach's alpha (α) to test the composite score of each scale on costs per recipient. I used Pearson's correlation coefficient (*r*) to associate significance found in individual items within each scale.

Purpose of the Study

The purpose of this quantitative study was to determine which ADL and IADL assessment items in Medicaid 1915(c) aged waiver recipients had the most significance on costs found in hyper-aging states. Relationships between the variables discovered in states with hyper-aging populations will increase system responsiveness in HCBS by identifying problematic issues that may not fully attend to ADL and IADL needs as Medicaid 1915(c) programs continue to grow and eligibility criteria broadens to allow additional applicants. Finally, regression analysis offered suggestions for refined HCBS policy measures that will relieve stresses placed on U.S. long-term-care public policy and administration.

Theoretical Framework

This study considered the contributions of the theory of positivism in statistical research. Positivism observes a natural phenomenon in scientific observations and field data. Positivism has its roots in empiricism, where data is verifiable through empirical evidence of the senses (Berkovich, 2018). Positivism provided a conceptual framework

that has been widely researched in the study of public policy and administration (Dunn, 2017) and provided the synergy required in reviewing program costs, value, and overall quality of care delivered to recipients. Specifically, in community-based research of health policy (York, 2017), positivism is an overarching theory that is beneficial to the study of hyper-aging states and functionalism in aged waiver programs, such as Medicaid 1915(c), and can extend the framework for future research.

Structural-functionalism theory, or functionalism, posits a view of society as having multiple intricate parts working together to make social structures. These social structures consist of individuals, organizations, and programs that meet social needs (Novak, 2018). Functionalism in the social sciences has evolved to meet the dynamic needs of society over time. The use of the functionalist perspective in modern aging research in the United States has increased due to the needs of a growing aging population (von Humboldt, 2016). Functionalism theory was a logical framework to study hyper-aging populations because the theoretical lens recognizes both the individual, or recipient, and social structures, such as social programs, as valuable components that can meet social needs. Hyper-aging populations increase the demand for social programs that support HCBSs in the United States. Therefore, the theory was valuable to the study because the rapidly growing aging population represents a greater percentage of the overall total societal need for cost-effective services and functionality.

Activities of Daily Living

ADL are basic tasks required for survival. They may assess overall functional ability in populations. Their origin dates to Katz in the 1950s when he assessed hip

fracture patients' functional ability. The study of significance of ADL in the functionality of geriatric patients in the United States is not new. However, its application in this study that utilized the items found in the assessment specific to the hyper-aging populations of Alaska, Nevada, and Utah is a relatively new concept.

Instrumental Activities of Daily Living

IADL are required for an individual to remain in an independent living condition, such as their home. IADL are more complex items and are measured differently than ADL. The Lawton and Brody Scale (1969) was developed to assess these complex functional tasks. Table 1 (Graf, 2013) is used as a predictor to detect the onset of more serious functional issues such as physical or cognitive decline.

Table 1

Lawton-Brody Instrumental Activities of Daily Living

Scoring: For each category, circle the item description that most closely resembles the client's highest functional level (either 0 or 1).

A. Ability to Use Telephone		E. Laundry	
1. Operates telephone on own initiative-looks up and dials numbers, etc.	1	1. Does personal laundry completely	1
2. Dials a few well-known numbers	1	2. Launders small items-rinses stockings, etc.	1
3. Answers telephone but does not dial	1	3. All laundry must be done by others	0
4. Does not use telephone at all	0		
B. Shopping		**F. Mode of Transportation**	
1. Takes care of all shopping needs independently	1	1. Travels independently on public transportation or drives own car	
2. Shops independently for small purchases	0	2. Travels via taxi, but does not use other public transportation	
3. Needs to be accompanied on shopping trips	0	3. Travels on public transportation when accompanied by another	
4. Completely unable to shop	0	4. Travel limited to taxi or automobile with assistance of another	
		5. Does not travel at all	
C. Food Preparation		**G. Responsibility for Own Medications**	
1. Plans, prepares and serves adequate meals independently	1	1. Is responsible for taking medication in correct dosages at correct time	1
2. Prepares adequate meals if supplied with ingredients	0	2. Takes responsibility if medication is prepared in advance in separate dosage	0
3. Heats, serves and prepares meals, or prepares meals, or prepares meals but does not maintain adequate diet	0	3. Is not capable of dispensing own medication	0
4. Needs to have meals prepared and served	0		
D. Housekeeping		**H. Ability to Handle Finances**	
1. Maintains house alone or with occasional assistance (e.g. "heavy work domestic help")	1	1. Manages financial matters independently (budgets, writes checks, pays rent, bills, goes to bank), collects and keeps track of income	1
2. Performs light daily tasks such as dishwashing, bed making	1	2. Manages day-to-day purchases, but needs help with banking, major purchases, etc.	1
3. Performs light daily tasks but cannot maintain acceptable level of cleanliness	1	3. Incapable of handling money	0
4. Needs help with all home maintenance tasks	1		
5. Does not participate in housekeeping tasks	0		
	Score		Score

Total Score_____A summary score ranges from 0 (low function, dependent) to 8 (high function, independent) for women and 0 through 5 for men to avoid potential gender bias.

Note. Adapted from Graf, C. (2013). The Lawton instrumental activities of daily living (IADL) scale: Best practices in nursing care to older adults general assessment series. *The Hartford Institute for Geriatric Nursing, New York University, College of Nursing.*

The ADL and IADL models were pertinent for the study due to their generalizable nature that includes functional factors influenced by characteristics of the individual, environmental characteristics of society, and nonmedical factors. The models proved to be reliable and valid after systematic review when compared to other models (Schoene et al., 2019). In the current study, its successful application to home- and community-based Medicaid populations solidified the model as the best theoretical framework lens to use in testing states with hyper-aging populations.

Using the Katz, Ford, Moskowitz, Jackson, & Jaffe (1963) and Lawton Scale (1969) theory as the directional framework, this study assessed the significance of functional variables within states with hyper-aging populations on overall cost per 1915(c) program recipient. Reliability and validity for similar measures have been established through numerous research studies in the traditional theoretical framework (Ware & Sherbourne, 1992; Wee, Davis, & Hamel, 2008). Naylor et al. (2016) established the importance of research in specific age cohorts in home- and community-based care for all stakeholders involved in the care process. These findings noted the need for further inquiry into the dynamic relationship of recipient's wellbeing in specific age cohorts. Similar research by Martin, Palmer, Rock, Gelston, and Jeste (2015) indicated variances within the Young-Old and the Old-Old cohorts in home- and community-based populations when similar methodology was used. Age is a discriminatory variable but research specific to states with hyper-aging populations in HCBSs is the critical premise of the problem statement that did not readily appear in the literature, which is discussed further in Chapter 2.

Medicaid 1915(c) Aged Waivers

The current study included a research background that reviewed qualifying 1915(c) Medicaid HCBS aged waiver programs in the top three fastest-aging states. I reviewed each state Medicaid 1915(c) aged waiver program to ensure that each waiver met certain qualifiers for inclusion. Each state waiver had to demonstrate: (a) services specific to the aged 65 and over cohort and under the 1915(c) Section authority, (b) that services provided were aimed at functional improvement, and (c) that the primary purpose of the waiver was not intellectual and/or developmental disability services. Aged waivers were titled differently in each state and may have included services provided to other recipients outside of the primary directive of the waiver. A sample brief description from each application is listed below along with provided services (CMS, 2017):

- Alaskans Living Independently (0261.R05.00). "Provides adult day, care coordination, respite, chore, environmental mods, meals, residential supported living, specialized medical equipment and supplies, specialized private duty nursing, transportation for aged individuals 65 - no max age, physically disabled ages 21-64" (Alaska Department of Health and Human Services, 2019)
- NV Frail Elderly (0152.R05.00). "The purpose of this waiver is to offer the option of Home- and Community-based Services (HCBS) as an alternative to nursing facility care. Access to the services available in the waiver is voluntary. No individual is required to leave a nursing facility. The target population is those individuals who are aged 65 and older who are eligible for

waiver services, have a Nursing Facility (NF) level of care (LOC), meet financial income criteria, and meet the criteria for home- and community-based services" (Nevada Department of Health and Human Services, 2020).

- UT Aged and Disabled (1076.R05.00). "The purpose of the waiver for Individuals Aged 65 or Older (thereafter referred to as the Aging Waiver) is to offer services to individuals aged 65 or older that meet the eligibility criteria of the waiver. The waiver gives this population the option to remain in a home- and community-based setting of their choice rather than a facility" (Utah Department of Health, 2020).

Research Questions and Hypotheses

The guiding research question was: Can statistical significance in ADL and IADL be associated with average costs per Medicaid 1915(c) aged recipient in Alaska, Nevada, and Utah? The guiding alternative hypothesis was: ADL, as measured by the Katz ADL questionnaire, are significant predictors of cost per Medicaid 1915(c) home- and community-based recipient in Alaska, Nevada, and Utah. The null hypothesis was: ADL, as measured by the Katz ADL questionnaire, are not significant predictors of cost per Medicaid 1915(c) home- and community-based recipient in Alaska, Nevada, and Utah. Further discussion of research questions, subquestions, and alternative and null hypotheses are found in Chapter 3.

Significance of the Study

Public administration involves organizing, planning, directing, coordinating, and controlling government operations (Carrigan, Pandey, & Van Ryzin, 2020). This

quantitative study used regression analysis to advance the framework of positivism in functional identifiers specific to the fastest-aging states using HCBSs, to plan for a future hyper-aged nation. These identifiers, both predisposed and learned, can be organized to provide a unique path in Medicaid 1915 (c) programs for the process of aging that each human being must ultimately endure. Greater understanding of indicators and their implications on costs in states with hyper-aging populations effects positive social change by allowing scholars and practitioners to direct and control the limited government resources available for the assessment, treatment, and planning provided by vulnerable states with hyper-aging populations. The study also included an analysis of age cohorts as discriminatory variables on overall functionality in ADL and IADL. Fourteen percent of the population in the United States is currently aged 65 and over (Rada, 2016). This current research supports additional study of relationships of the predictor variables and average costs in states with hyper-aging populations. Economic implications are inherent as well when populations age, labor forces shrink, capital stock increases, and growth is weakened (Choi & Shin, 2015). The hyper-aging phenomenon has already happened in other industrialized countries, such as Japan. The United States will be a hyper-aged nation by 2030, when 20% of citizens will be aged 65 or older.

Without indicators in aging populations in the United States, maintaining the functional balance of the elderly population places a burden on social programs and institutions that are already overextended in a relatively infantile national long-term care system with few universal indicators in place to gauge success. Home- and community-living agencies provide support to Medicaid recipients who are transitioning into the later

stages of the aging life course. This study targeted HCBSs Medicaid 1915(c) waiver recipients classified as aged in Alaska, Nevada, and Utah. According to U.S. Census Data, these states were the fastest-aging from 2000-2011 and provide clues to utilization, costs, and outcomes in social programs such as Medicaid as the country becomes hyper-aged by 2030.

Social Change Implications

Aged recipients of Medicaid 1915(c) waivers for home- and community-care are increasing every year and research that correlates significant variables with cost is valuable to many public and private stakeholders (Baicker et al., 2015; Bohl et al., 2015; Van Cleave, Smith-Howell, & Naylor, 2015). The implications for social change include greater understanding of the factors that significantly influence functionality in individual health and costs in states with hyper-aging populations. Improved assessment, planning, treatment, and evaluation of recipients to close the gap in morbidity and mortality rates can be achieved by studying age-related factors, thereby improving the life course. Home- and community-based organizations account for more than 50% of total long-term care expenditures by Medicaid and have demonstrated improved quality of life, decreased institutionalization, and increased overall well-being (Segelman, Cai, van Reenen, & Temkin-Greener, 2015). As the number of elderly increases due to hyper-ageism, the industry of home- and community-based care will expand as new organizations will enter the market, and the number of Medicaid recipients enrolled in waiver programs such as 1915(c) will increase.

Studies indicate strong correlations between HCBS usage and improved quality of life when compared to institutionalized settings (Brown, Thompson, Zack, Arnold, Barile, 2015; Danilovich, Corcos, Marquez, Eisenstein, & Hughes, 2015; Walsh et al., 2015). Conclusions by Wysocki et al. (2015) revealed that nursing home recipients had greater physical and cognitive limitations than recipients receiving home- and community-based services on average, but evidence on the outcome trajectories of aging populations is limited. Social change implications in the growing national aging population begins with understanding states that already contain the fastest-aging populations that are serviced by home- and community-based Medicaid 1915(c) waiver programs. Improving individual health, understanding societal costs, and enhancing quality of social insurance programs encourages positive social change.

Policy Implications

Creating and developing common standards for the future of HCBSs is timely because of the high level of demand on an expanded market structure created by states with hyper-aging populations. State limitations on the eligibility and services have remained relatively stable, but state cost control policies and budgetary concerns limit access due to the lack of infrastructure for services. Ng, Stone, and Harrington (2015) noted that access to HCBS could be improved if policies were standardized and more indicators of success were readily available.

While there is potential for positive social change in ADL and IADL research in states with hyper-aging populations, important policy changes should also be noted. Research on the aging life course once focused on baseline mortality rates in community,

clinical, and hospital settings. As the aging population continued to increase, more importance was placed on the societal cost and individual well-being during the aging life course and how noninstitutionalized care could impact the outcomes of an increasingly aging society in noninstitutionalized settings. Institutionalization became less favored after legislative reforms, Medicaid changes, and deinstitutionalized methods of aging in place such as HCBSs became more available in the United States. Appreciating the significance of functional indicators in states with hyper-aging populations lowers total economic costs to society in the long run.

Suggestions for the adoption of universal normative criteria in the assessment of program strength are also addressed in the study conclusions. ADL and IADL indicators have always been beneficial to health care policy, but their emphasis on HCBSs in this study comes from increased demand for HCBSs. Continuous quality improvement in aging begins with understanding the states that are experiencing the fastest growth in aging populations first and then being able to generalize those findings in a hyper-aging United States.

Assumptions

- The theoretical framework of functionalism using Katz et al. (1963) and Lawton and Brody (1969) as assessments presented the best possible basis for the study of functionality and its effect on cost is critical to the current research design.
- Healthcare professionals and medical providers answered questions presented to them in the assessments fairly, truthfully, and to the best of their abilities.

- The selected assessments and variables examined the research problem to the best of their capabilities using reliable and valid data that is accurate and not incomplete.
- The selected research design offered the most appropriate solutions to the research questions to the best of its ability, given the complexity of the research problem.

Scope, Delimitations, and Limitations

Participants for this research study were selected from recipients who received Medicaid 1915(c) aged waiver status in Alaska, Nevada, and Utah. Approval of the Walden University Institutional Review Board allowed the collection of data from Medicaid recipients in 2012 and 2016 through an exhaustive data request process. This was the most recent data that was available when the data request process began. The study was limited to the required socioeconomic realities of Medicaid recipients and therefore may not be generalizable to all aging populations. In the case of this study, ADL and IADL assessments for recipients were recorded by a trained medical or health professional by proxy. The assessments were conducted before 1915(c) waiver participants were entered into the CMS system.

Similar scales employ disease-specific questions to quantify the relevance of one or more variables on an independent variable. Studies that emphasize only certain age cohorts may prove structurally unreliable due to the discriminatory construction of questionnaire items (Hickey, Barker, McGee, & O'Boyle, 2005), such as physical function, which is generally better in younger cohorts. Proxy respondents, such as nurses

and other medical and health professionals, completed survey items for individuals who were functionally unable to answer questions for themselves. Andresen, Vahle, and Lollar (2001) cautioned that proxy respondents can overestimate and underestimate factors associated with ADL when completing surveys for someone else and this is discussed further in Chapter 5.

The purpose of the study was to analyze the significance of ADL and IADL indicators on average costs found in states with hyper-aging populations using the Medicaid 1915(c) HCBSs. The scope of this study will not (1) offer medical suggestions on how to improve functionality, individual outcomes, or quality of life or (2) explicitly offer public policy solutions or partisan ideas for improvement of HCBSs. To mitigate personal bias in forming the research questions and data analysis, a quantitative research design that reflects the recipient-centered perspective was selected to improve validity and reliability.

Definition of Terms

Activities of daily living (ADL): The basic functional requirements for everyday living and the common daily demands of human life when performing activities (Katz et al. 1963).

Aging: A demographic determinant of the status of a population of people, generally classified as containing 7–13%, that have reached age 65 (Novak, 2018).

Cost(s): Costs are defined in this research as the economic resources required for care of individuals. They are quantified by dollars ($) and coded using an interval scale.

Cost per recipient: Defined by the CMS as the average economic (USD) cost of care per Medicaid HCBS 1915(c) waiver recipient.

Elderly: A social, cultural, and medical term that describes the perception of someone as growing old or experiencing the aging process. Chronologically in the literature, it is defined as someone who has reached age 65 and older (Orimo, 2006).

Home- and community-based services (HCBS): Refers to programs for individuals that require care for physical, mental, and social illness to receive services in their home or community. Medicaid defines HCBSs as "opportunities for Medicaid beneficiaries to receive services in their own home or community. These programs serve a variety of targeted population groups, such as people with mental illnesses, intellectual or developmental disabilities, and/or physical disabilities" (CMS, 2020).

Hyper-aged: Societies that have already attained a percentage of 20% or more individuals aged 65 and older in the general population. This consists of all cohorts classified aged 65 and over.

Hyper-aging: Defined in the study as populations on a trajectory to reach a state of 20% or more individuals aged 65 and older, or hyper-aged, by 2030.

Indicators: These represent statistical significance, or lack thereof, in quantitative analysis when a dependent variable is influenced by a certain independent variable or group of independent variables (Ciegis, Ramanauskiene, & Startiene, 2015).

Instrumental activities of daily living (IADL): The ADL that are more complex than the most basic levels of functionality in the ADL and require more thought and concentration of the adult to maintain independence.

Predictors: A term used in statistics to describe an independent variable that is controlled in an experiment to observe significance on a dependent variable. In regression research, predictors are values that explain the impact of a variable on an outcome (Chatterjee & Hadi, 2015).

Well-being: Associated with the concept of quality of life that assesses a recipient's total life fulfilment and reaction toward their perceived life course. Additional discussion on operational terms and definitions can be found in Chapter 3.

Chapter Summary and Overview of the Study

This chapter addressed the importance of the U.S. aging population dilemma and identified states with the fastest-aging populations, according to census data from 2000-2010. A background of the aging population and public policy in the U.S. and other countries that contain a larger proportion of aged individuals was presented. Implications of failing to understand the consequences of inaction associated with hyper-aging populations in the U.S. were also addressed. The theoretical lens (Creswell, 1994) presented in Chapter 1 introduces functionalism, ADL, and IADL theory (Katz et al., 1963; Lawton and Brody, 1969) as a means for assessing home- and community-based Medicaid programs in states with hyper-aging populations.

A review of the relevant literature on ADL, instrumental IADL, and its application to the highlighted gap in states with hyper-aging populations is found in Chapter 2. Research design and methodology for the study of ADL and IADL factors using differentiated instrumentation is discussed in Chapter 3. Chapter 4 will summarize the research findings and Chapter 5 will synthesize and interpret the research findings.

Chapter 2: The Literature Review

Introduction

This exhaustive literature review provided support for the purpose, problem statement, research questions, and hypotheses. Because states with hyper-aging populations present unique challenges to health policy, the purpose of this study was to associate ADL and IADL in the fastest-aging of Alaska, Nevada, and Utah with costs per Medicaid 1915(c) recipient. The research also determined the significance of certain demographic factors on the variables. The problem statement identified states with hyper-aging populations and increased costs of programmatic growth, such as Medicaid 1915(c). The primary research question was: Can statistical significance in the ADL and IADL be associated with average costs per Medicaid 1915(c) aged recipient in Alaska, Nevada, and Utah? The main alternative hypothesis was: ADL and IADL are significant indicators of average costs per Medicaid 1915(c) recipient in states with hyper-aging populations. This literature review is comprehensive and aligns the purpose of the study with the problem statement, research questions, and hypotheses.

Organization of the Literature Review

I discuss functionalist theory, ADL, IADL, and their application to states with hyper-aging populations in Chapter 2. I review traditional and contemporary theory in states with 1915(c) HCBSs using similar methodology. I also discuss Its importance to the study, which examines ADL and IADL factors in the fastest-aging states. I present what is known about the variables in the literature and their significance with aging populations, specifically in states with hyper-aging populations containing a Medicaid

1915(c) program. I explain studies using factorial analysis and regression methodologies that rank statistical significance found in the variables according to limits of this study. The chapter concludes with a discussion on utilizing data on ADL and IADL found in HCBSs and presents the implications of these predictors on average costs per 1915(c) Medicaid recipients in the fastest-aging states.

Literature Review Research Strategy

The literature review highlighted a gap in knowledge from a failure to address ADL and IADL and costs in Medicaid 1915(c) waiver programs found in the fastest-aging states. Studies that involve long-term care of elderly populations, particularly HCBS programs in the United States, are drawn from an interdisciplinary background within the social sciences including management, health sciences, biology, psychology, sociology, and public policy and administration. Therefore, the available body of research for the this study crossed the boundaries of many scholarly disciplines. In this literature review, I draw select works from these disciplines to explain what is known in the literature about ADL and IADL indicators found in HCBS. Specifically, how there is a gap in the literature that does not address these indicators in states with the fastest-aging populations and a qualifying Medicaid program.

Finally, I discuss implications of normalized assessment. The taxonomy of the literature review includes the focus, goal, perspective, coverage, organization, and audience structure (Cooper, 1988). I used the following interdisciplinary electronic databases in the literature search: Academic Search Complete, U.S. Bureau of Labor and Statistics, CINAHL & Medline, Walden University Dissertations & Theses, Google

Books, Google Scholar, National Bureau of Economic Research, Political Science Complete, PubMed, and Sage Premier. I used the following keywords and phrases in the search of the literature: *functionalism in aging, home- and community-based services, Medicaid 1915(c), states with hyper-aging populations, geriatric assessment, activities of daily living (ADL), and instrumental activities of daily living (IADL),* and *1915(c) Medicaid recipients*. The theoretical framework for activities of daily living was developed from searching the U.S. Centers for Medicare and Medicaid, Academic Search Complete, and Google Scholar databases using the following key terms: *functionalist theory, activities of daily living (ADL),* and *instrumental activities of daily living (IADL).*

Relevance of the Literature to the Research Question

The primary focus of this study was to analyze what are the most significant ADL and IADL predictors of average cost per Medicaid 1915(c) recipient in states with hyper-aging populations. Frameworks for ADL and IADL in the assessment of functional care delivery are broad and include interdisciplinary models that encompass numerous variables beyond the scope of this literature review. Similar research frameworks address only a limited number of variables influencing costs in noninstitutionalized settings. My major concern for the research was to address the significance of predictor variables of ADL and IADL on the dependent variable of cost per recipient in states with the fastest-aging populations, which were Alaska, Nevada, and Utah. States with hyper-aging populations represent a major demographic transition, occurring for the first time in U.S. history by 2030, and reflect a global social concern (Smith, 2015). Japan is the first nationality to reach a hyper-aged state and other industrialized populations anticipate

following course (Jin, Simpkins, Ji, Leis, & Stambler, 2015; Yong et al., 2015). Industrialized societies in Europe and Japan have policies in place for the aging dilemma. However, research in this literature review indicated the policies of institutions responsible for aging populations are still outdated in the United States (Henning-Smith, Gonzales, & Shippee, 2016; Jarrott & Ogletree, 2016; Van Cleave et al., 2016; Zubritsky et al. 2016).

Researchers in the United States have indicated a need for indicators to understand costs in vulnerable aging populations. These populations rely on social insurance programs such as Medicaid 1915 (c) to bear the brunt of the financial burden for home- and community-based care (Akincigil & Greenfield, 2020; Cress, 2015; CMS, 2015; Government Accountability Office, 2015; Van Houtven, 2015). Identifying ADL and IADL factors that are most significant in states with hyper-aging populations using Medicaid waivers can aid in understanding costs per recipient. There was much speculation in the literature review regarding the dependent variable, but cost per recipient remained an unexplored topic at the regional and national levels. This study contributed to the literature by associating costs per recipient in the fastest-aging states with significance found in ADL and IADL of Medicaid 1915(c) recipients as the nation moves toward a hyper-aged status by 2030.

To understand the most vital ADL and IADL indicators in future aging populations, it was important to consider the current frameworks that can be applied to the fastest-aging. The problem statement identified few ADL, IADL, and cost indicators in Medicaid waiver programs specific to states with hyper-aging populations. In 2015,

Mathematica Policy Research cited individual predictors in HCBSs as needing the most improvement in the quantitative framework (Bohl et al., 2015). Contemporary studies emphasized the importance of variances in the predictive powers of ADL and IADL in aging, but research in the fastest-aging state Medicaid programs remains limited. This quantitative study used regression analysis, analysis of variance, and analysis of covariance to correlate significance of ADL and IADL functional limitations with costs per recipient in HCBS Medicaid populations found exclusively in states with hyper-aging populations. The literature review included (a) available information on functionalism in aging, ADL, IADL, and cost per Medicaid recipient; (b) current theories in the field; (c) knowledge gaps in theoretical application in the study of states with hyper-aging populations; (d) positive social change implications the research will have; and (e) applicable field research methods to the study.

Functionalism

The theory of functionalism, also known as structural functionalism, was originally developed by Durkheim (1884). It considers individuals, organizational role players, and social institutions as a sum of each part of society, and like the role of a cell in an organism, there are many parts that contribute to overall functionality. In modern literature, functionalism in aging considers the continuum of role players that include the individual, social institutions, and programs (Wan & Antonucci, 2016). It seemed logical to examine the theory in this study, as recipients represented the individual aging process and the Medicaid 1915(c) program represented a societal explanation for the problem. Variables in the current research also link the micro and macro levels of thought in

modern research by considering the impediments of the individual and the total average costs to society (Novak, 2018). Functionalism in aging emerged as relevant theory in the mid-1970s (Bengtson, Kim, Myers, & Eun, 2000). Functional theory in HCBS have been undervalued until recent discoveries (Wen et al., 2017). Wen et al. (2017) associated appropriate indicators with successful social programmatic implementation.

Activities of Daily Living

ADL have been referred to in the literature since 1935 (Feinstein, Josephy & Wells, 1986) but. Katz and his colleagues formally developed the Index of Activities of Daily Living assessment in 1963. This scale is commonly referred to in the literature as "The Katz Scale." It has been modified numerous times as the needs of populations have changed, but it is widely known and referenced in the literature over 9,200 times. The Katz Index of Activities of Daily Living is one of the most referred to functional assessment scales used with aging populations (Ashby & Beech, 2016; Kane 2015; Kogan, Wilber, & Mosqueda, 2016; Tyler, & Fennell, 2015). Use of the Katz Index promotes a common language of functional indicators that are generalizable to similar aging populations (Wallace & Shelkey, 2007), such as those found in the current study. In the traditional literature, functional levels have increasingly been used to study variables ranging from biological to psychological in clinical trials, treatment planning and implementation, and populations in all age groups (Schoene et al., 2019; Strayhorn et al., 2019; Terwee et al., 2015; Wilson & Cleary, 1995).

While it is outside the scope of the literature review to discuss all concepts related to levels of individual independence in ADL, the scale created by Dr. Katz provided a

summative practical assessment in the literature that was suitable for the study of recipients of HCBSs in the current study. Many studies use the ADL scale to assess functionality in aging populations, however it is underrepresented in the literature for Medicaid 1915(c) waiver programs in states with hyper-aging populations (Rantz et al., 2017; Spillman, 2016). Similar research in Michigan using 8,172 waiver participants found that the level of ability to independently bathe was associated with the highest statistical significance on placement into a long-term care facility and increased cost (Wu, Li, Oberst, & Given, 2016).

The ADL scale provide excellent predictors of functional limitation for an individual that can be disease specific, such as Alzheimer's Disease (AD). However, scholars (Reed et al., 2016) noted that ADL should be emphasized more as a predictor variable in the study of its relationship with costs. Researchers eventually discovered other factors that influenced ADL limitations, such as nutritional deficiencies, which are not measured on the functional scale and that improvement in ADL lowered costs of care. The literature indicated functional limitation predicts premature mortality that may be preventable with exercise, not smoking, good nutrition habits, stress management, and hypertension treatment (Weaver & Roberto, 2015) and indicated the average number of ADL functional limitations was 4.21 with an average age of 80.89 in a conventional HCBS sample. Other research (Newcomer et al., 2016) noted the outcomes of users of HCBS and average number of ADLs (Ben-Shalom & Stapleton, 2016; Tilly, 2016) but studies ranking their prevalence in the fastest-aging states and associations with cost per recipient remained an underrepresented area in the literature review.

Instrumental Activities of Daily Living

IADL are developed from the basic ADL but are more complex tasks required in an independent living environment. Lawton and Brody (1969) developed the IADL scale that measures eight domains of tasks required for more intricate functions of daily living. It is commonly referred to in the literature as simply the, "Lawton Scale." Assistance with IADL using Medicaid 1915(c) waivers require more focused services for dependent individuals and may be more significantly relatable to costs than others (Dean, 2019; Fralich, 2015; Libersky et al., 2016; Wolff et al., 2019). Higher independence scores in the literature (Lipson et al. 2016) are also positively correlated with increased functionality but strong positive correlations with costs in the research of the fastest-aging states was not readily available.

Recent research in HCBSs found inconclusive results when IADL was compared with healthcare costs (Akincigil & Greenfield, 2020). The findings indicated that IADL status should be considered in future research when studying the implications of costs associated with patient limitation and types of housing available. Importantly, Akincigil and Greenfield (2020) concluded that the potential for cost mitigation using IADL had not been assessed in many health studies as a dependent variable. Housing status was also found to be a strong predictor of fewer overall costs in institutionalized care but the available research in noninstitutionalized care, such as home- and community-based options was not readily available (Gusmano, Rodwin, & Weisz, 2018). IADL has extensive use in studies that surveyed traditional long-term care facilities, including skilled nursing facilities (SNFs) and assisted living facilities (ALFs) but assessment in

home- and community-based populations concluded there was insufficient evidence in the literature to support cost associations.

Recent studies of IADL in HCBS yielded few generalizable results but indicated IADL had increased overall usage in the literature after conducting a systematic review of the literature dating back to 1999 (Eiken et al., 2016; Sonnega, Robinson, & Levy, 2017). Wu et al. (2016) associated the level of financial management as the single most significant IADL predictor of nursing home placement and increased costs of care in Michigan but a comparable historical overview of the research could not determine a link between functionality and cost in Alaska, Nevada, and Utah (Erlyana, Schuldberg, & Last, 2016). The Lawton Scale has proved reliable and valid in many research findings as it has been referenced over 11,000 times in the literature (Dominiak, & Libersky, 2016; Weaver, & Roberto, 2015). It is particularly relevant in home- and community-based care of older adults because it assesses optimal assistance needed, simplifies the process of assessing for limitations, and records easily reviewable results for providers found at all levels of recipient care. Methodology for using the IADL scale and improving reliability and validity in this study will be discussed further in Chapter 3.

Functional Assessment in Home- and Community-Based Services

Functional assessment in home- and community-based studies remains a rapidly expanding section of the United States gerontological literature due to the expansion of access by states, increased number of enrollees and recipients, and growing national interest in a hyper-aging population (Kleiner, Santos, Fustinoni, & Seematter, 2018). Functional theoretical assessment using ADL and IADL in HCBSs and association with

overall costs became popular in traditional gerontological literature for states with qualifying programs in the 1990s (Beaulieu, 1991) but the literature did not yield studies that could signify data that was specific to hyper-aging states. The importance of assessment and cost effectiveness in aged waivers became essential as the influence of growth and spending in care planning and treatment delivery in the local community grew to become a large part of the care coordination process of elderly adults (Kapp, 2016). Most states require that a recipient meet some baseline criteria for waiver acceptance, such as one (1) or two (2) functional limitations but scholars (Segelman et al. 2017) note rapidly changing eligibility criteria that broadens access for a larger number of enrollees.

Similar studies (Maerki, 2016) cite ADL and IADL as an integral part in understanding functional impediments in HCBS but research that associated functional assessment in specific states with the fastest-aging populations under Medicaid waivers remains unfounded. Using regression analysis, a ten-year panel study from 1993-2002 surveyed a national sample (M=77.36 years) that found aged waiver programs in states that supported HCBS as a viable option for long-term care had a strong correlation between ADL/IADL functionality and improved quality of life given their low levels of function and recent functional decline (Muramatsu, Yin, & Hedeker, 2010). The authors noted that extending the usage of the ADL and IADL scale in HCBS should be considered in future research. Using these traditional theoretical findings in the literature, researchers later concluded that HCBS utilization can benefit vulnerable and underserved populations (Chen, Amano, Park, & Kim, 2019).

Costs of Care in Home- and Community-Based Services

The implications of costs in home- and community-based care were reviewed but information specific to hyper-aging state populations remained limited in the United States literature. Cost is defined in the traditional literature as the relationship between the proportion of input resources (monetary costs) and the number of recipients that are served, also known as output in healthcare economics (Applebaum, 2015; Thomas, & Applebaum, 2015; Wiener, Segelman, & White, 2020). Analyses of 194 older adults by Roppolo et al. (2015) revealed that given a starting point of empirical data, similar methodology would generate a trajectory to a second outcome, such as costs. However, identifying, categorizing, and evaluating health care outcomes using cost as a measure in HCBS is not the purpose of the study. This literature review defines "cost" as a variable in which the aggregate programmatic cost is represented as the average cost per Medicaid recipient per year. Cost variations by state in Medicaid 1915(c) waivers contain too many disparities in the control of costs, functions of spending, and delivery of services within each state (Lincoln, 2019). Therefore, it is outside the scope of the literature review to determine cost mechanisms in each state. Chapter 5 discusses cost variations in each state and its economic impact on the findings.

The literature review presented challenges in the discovery of data related to expenditures on the Medicaid 1915(c) program because of the large inter-state variations on the structure of budgets, or lack thereof, related to the aged waivers. Total enrollment and spending in Medicaid increased by an average of 10.1% over the 2012-2015 with a 13.9% increase in 2015 (Kaiser Family Foundation, 2015). Per Medicaid.gov, there are

8.3 million individuals aged 65 and over who are eligible for Medicaid, or 18% of the total overall U.S. aging population. This ratio is expected to increase as a hyper-aged nation becomes a reality. Older studies in the literature noted in 1993 the average cost per HCBS recipient was $222 and in 2002 it was $524 (Santini et al., 2010). In 2011, 191 section 1915(c) Medicaid waiver programs had 1.45M recipients at a cost of $38.9 B (Hong, & Casado, 2015; Reaves & Musumeci, 2015). A more recent study (Eiken et al., 2016) of waiver authorities in the literature yielded 125 Medicaid 1915(c) Aged waivers at a cost of $41.5B.

Medicaid Extract Database (MAX) validation reports were used to compare the average costs of care per recipient of Medicaid 1915(c) HCBS waivers in the top three fastest-aging states in the U.S. (AoA, 2018) from the year 2000-2011. These states included Alaska, Nevada, and Utah. These states ranked as hyper-aging and were defined as those having an aggregate increase of individuals aged over 65 years higher than 20% from 2000-2011. For inclusion, states also had to incorporate a 1915(c) Waiver program and have a classification for aged waivers. The top three states with hyper-aging populations alphabetically were reviewed, beginning with Alaska which had an average cost per recipient of $20,293 in 2005 and $39,804 in 2012. The over 65 years old population grew 58.1% between the same span of time. It is important to note that states did not begin tracking statistics for the Medicaid 1915(c) program until 2005. Nevada was also examined and revealed a cost per recipient of $16,143 in 2005 and $15,622 in 2012 with a cohort growth of 53.1% between 2000-2011. The over 65 years cohort in

Utah grew 35.3% from 2000-2011. Cost per Medicaid 1915(c) recipient classified as aged jumped from $21,344 in 2005 to $28,301 in 2012.

The *2017 Profile of Older Americans* by the AoA (2018) revealed the top ten fastest-aging states averaged a 36.37% increase in population over 65 years. Alaska increased 71%, Nevada increased 57.8%, and Utah increased by 47.3%. It seemed only logical to review the costs associated per Medicaid 1915(c) recipient in the top three states. The costs of care per 1915(c) HCBS Medicaid recipient averaged an increase of 43.98% in 2005-2012. Costs per recipient in Alaska rose 96.14% from $20,293 in 2005 to $39,804 in 2012, while Nevada decreased costs 3.22% from $16,143 to $15,622, and Utah recipient costs increased 32.58% from $21,344 in 2005 to $7,351 in 2012. Regression analysis of ADL and IADL indicators in these three states with hyper-aging populations in the literature was limited. However, review of the predictor variables can show influence of each functional impediment on cost per recipient. This research suggested similar analyses can quantify significance in older adults and was applied in the theoretical framework for the current study of states with hyper-aging populations.

Older Adults in Home- and Community-Based Services

The environment of long-term care delivery is a topic that was covered exhaustively in this literature review. Studies that involved care delivery at home, in assisted living facilities and community options, and skilled nursing facilities (SNFs) were studied extensively to determine what differences, if any, the literature presented using the predictor variables and the dependent variable. The literature contained conflicting narratives on overall success in each type of institutional and noninstitutional

settings, but it was universally understood that average long-term care costs were higher in SNFs when compared to HCBSs (Ligus, 2019) and that HCBS should be further studied as a mediator for costs. The consistent findings of studies involving older adults in home- and community based service programs was that studies were mostly inconclusive on a larger national scale review of similarly researched populations due to the many inconsistencies that varied by state reporting requirements, programmatic design, and organizational differences in reporting factors (Wilson, & Bachman, 2015).

The emphasis on ADL/IADL factors is crucial in assessment of home- and community-based interventions on chronic disease in populations such as the aging (Fabius, & Robison, 2017; Lin et al, 2015). Regression analyses that rank significant predictors on variables such as cost were found in the traditional theoretical framework using similar research designs (Kunnen & Bosma, 2000; Kunnen, 2012; Meiners et al., 2014; Steenbeek & Van Geert, 2008; Van Geert, 1991; Van Geert, 1994). While there was substantial evidence to link functionality with age in these studies of HCBS, research in states with hyper-aging populations remained largely unseen. Multiple studies (Jayadevappa, 2017; Wickson-Griffiths, Kaasalainen, & Herr, 2016) addressed the need for additional research of the older adult population in HCBS but none acknowledged the importance of hyper-aging states as a basis for understanding functionality in a hyper-aging nation and world.

U.S. Home- and Community-Based Medicaid Populations

Home- and community-based recipients using Medicaid 1915(c) waivers populations differ from general aging populations (Troutman-Jordan, & Heath, 2017)

receiving long-term care but functional improvements were noted by recipients (Reckrey et al, 2015) who had access to care. Medicaid 1915(c) HCBSs in the United States consist of economically disadvantaged and chronically ill recipients who use managed long-term care (MLTC) or an integrative care model (Van Cleave et al., 2016). This unique and growing aging population percentage of Americans can account for the increased spending on long-term-care services by Medicaid but little evidence exists in the literature to support assessment of ADL and IADL (Naidu, 2019; Sako et al., 2019) in states with hyper-aging populations and relatable associations with overall cost per recipient.

Medicaid cost per recipient and success of HCBSs in the improvement of ADL and IADL varies with each discriminatory variable. These variables can include age, sex, race, and geographical location. Older recipients who live in rural areas usually have more difficulty in access to care, which indirectly affects their overall quality of life and outcome trajectory (Tedder, Elliott, & Lewis, 2017). Blacks and Hispanics stayed in their homes and communities longer before admission into a skilled nursing facility or HCBS program (Cai & Temkin-Greener, 2015). This suggests a possible variance when research variables are adjusted for race. Gender is also a reliable significant variable in Medicaid programs. Mental health complications that were examined appeared more frequently in females when compared to males (Khan & Flynn, 2015). Modern research (Bohl et al., 2015) indicates that significance of indicators in Medicaid HCBSs populations can be adjusted by age, sex, and comorbidities. This study also utilizes a similar demographic analysis discussed in Chapter 3.

Age was generally not a significant indicator of usage but demonstrated variability in instrumentation when measuring age-adjusted significance in Medicaid populations. Studies in the literature did find correlations between HCBSs usage and performance indicators when assessed with age as a predictor variable in Medicaid programs (Bohl et al., 2015). However, populations that have a positive correlative relationship between age and mean usage of are HCBSs populations who are advanced in age and are more likely to utilize HCBSs programs as they become more at risk for certain conditions such as hospitalization, fall, and mortality (Danilovich et al., 2015).

Research (Kang, Sheng, Stehlik, & Mooney, 2020) affirmed the study premise that ADL and IADL assessment in hyper-aging states can reveal significant predictors on recipient outcomes in patients who were receiving HCBSs. While literature on ADL and IADL indicators is readily available, this study extends the framework to include hyper-aging states with Medicaid 1915(c) waiver programs to understand outcomes in the fastest-aging population in the U.S. Studies indicate (Chen, Amano, Park, & Kim, 2019) these populations represent not only the largest proportion of spending in long-term care in recent history, they also serve vulnerable populations who are at the highest risk for poor health and longevity in the later years of their life.

States with Hyper-Aging Populations

The literature remains in the beginning stages when the topic of hyper-aging and hyper-aged states are discussed in the scientific knowledge base. The theoretical framework does contain articles that compare the philosophies of different nations and there are concerns that were raised in other nations, but awareness and concerns seem to

still be in infancy status when compared to other industrialized nations (Bengtson et al., 2000). The global literature concentrates mostly on Eastern countries (Fong, Yu, & Zhu, 2020), while aging research in the United States remains idle with most emphasis on the overall general aging demographic and little emphasis on state populations that contain the highest concentrations of individuals aged 65 and over. This disparity is only most notable in research studies that emphasis illnesses and outcomes.

Assessment of states with hyper-aging populations in home- and community-based care is not an easily accessible topic in the literature. A systematic literature review of 3,000 articles from 1990-2014 revealed a lack of literature that targeted aging populations in home- and community-based care (Kogan et al., 2016). Modern research (Roppolo et. al, 2015) supports the notion that delineation of guidelines is necessary when employing regression analysis in states with hyper-aging populations. Khan and Flynn (2015) surveyed adults in 21 countries using multivariate models to conclude that imbalances remain consistent across all age cohorts, and significant predictors in older adults are largely underdeveloped in states with hyper-aging populations. Indicators associated with functionality and cost in states with hyper-aging populations can improve understanding of the Young-Old, Middle-Old, and Oldest-Old cohorts.

A study delineating two respective aging cohorts (n = 976) from the general aging population was conducted by Martin et al. (2015) and examined associations of functionality in the Young-Old (aged 50–74; n = 365) cohort and the Old-Old cohort (aged 75–99 years; n = 641) of community-dwelling adults. Multivariate regression analysis revealed lower associations between functionality in the Old-Old cohort when

compared to the Young-Old cohort as a predictor variable. The conclusions revealed that functionality is a multidimensional paradigm when variances were studied between Young-Old cohorts and Old-Old cohorts. This research is significant to the current study because it suggests a criterion for the delineated study of aging as fundamental to understanding significant differences within the functionality found in states with hyper-aging populations versus the general aging population.

Seventy percent of deaths in Americans occur from chronic illness. Progress has been made, as heart disease and cancer death rates are declining, but age-related illnesses, such as Alzheimer's disease, have increased in frequency as cause of death. Modern literature suggests utilizing the existing functional framework of older adults and extending it into other aging populations (Bello et al., 2015), such as the current findings in states with hyper-aging populations. Significant functional indicators in the fastest-aging states is beneficial to understanding care recipient trajectories in vulnerable populations in the United States. Similar research (Elboim-Gabyzon, Agmon, Azaiza, & Laufer, 2015; Kim, Lehning, & Sacco, 2015; Luz, Oliveira, Noblat, 2016; Wångdahl, & Mårtensson, 2015) found reliable and valid indicators when various nationality and minority aging populations with functional and disability ranges in home- and community-based care were tested.

Elboim-Garbyzon et al. (2015) fitted a similar model to this study successfully into a cross-cultural Arabic version, while Kim et al. (2015) tested a Korean version, and Wangdahl et al. (2015) developed a Swedish version. Jain et al. (2015) used a similar model to measure specific correlations in U.S. older adults requiring hospitalization. This

research supported the concept that regression analysis in aging populations can be fitted to population-specific samples and disease-specific adaptations, or limitations as presented in the current study, to measure significance. The literature also indicated little available research on populations that were classified as the fastest-aging in the nation using data from 2000-2010 from the United States.

Toward Normalized Assessment of Activities of Daily Living/Instrumental Activities of Daily Living in U.S. Home- and Community-Based Services

This literature review considered several ideologies, social movements, and philosophies universally considered as the acceptable principles and practices found in professional organizations and individuals. These entities are involved in the agenda building, formulation, implementation, and evaluation stages of the public policy processes (Jones, 1970). The home- and community-based care population is dependent on changing social norms of the aging population as the largest segment as the of the general population demanding long-term-care services (Doty, Nadash, & Racco, 2015). Kudo et al. (2015) insisted that future contributions to the literature on the global aging problem begin with understanding the international population phenomena of hyper-aging societies, such as Japan. A systematic study on well-being of older adults conducted by Fields, Anderson, and Dabelko-Schoeny (2016) found that assisted living communities and home care influenced recipient outcomes, but further research was needed to identify normative criteria in HCBSs.

Normalization of HCBS policy in the U.S. remains largely underdeveloped in literature. Similar postindustrial societies that contain hyper-aging populations and

emphasize lower costs with stable amounts of service are Denmark, Germany, and Japan (Marin, 2017). Countries with a large population advanced in age, such as Japan are gerontocracies. They are heavily influenced by the elderly, with complex networks of public and private stakeholders. The increasing role of free markets as an outlet for equity, efficiency, and sustainability in postindustrial societies will continue as overburdened public programs (Reher, & Requena, 2018) are unable to keep up with care demands of the hyper-aging population in the United States. There are many cost indicators in institutionalized provider-centered research, but the problem statement indicated a lack of formal approaches in the assessment of ADL and IADL independence levels and its influence on costs in HCBSs found in states with hyper-aging populations.

The urgency of the research problem is found within a twofold fundamental shift of HCBSs which are now primarily funded by Medicaid and increased governmental regulation of private market forces attempting to mitigate costs, which creates a new hybrid of care delivery (Huberfeld, 2015) focusing on cost-efficiency and recipient-centered values. Public government and private industry stakeholders are now seeking how to measure quality in HCBSs settings by using quantified outcomes when making decisions. However, the exponential growth of the Medicaid program in HCBSs was not expected to grow into its current scope. The expansion of Medicaid and the shift in the health care market, particularly long-term care, has created a new phenomenon scholars have labeled health care federalism (Gusmano, 2015). The U.S. Constitution allows for states to create laws and regulations for any areas left undefined by the federal government and long-term care is proving to be the undefined new frontier.

States may give preference to certain indicators (Henley, 2016) that vary along with population needs and program budget constraints. Although the Affordable Care Act of 2010 established a new federal income level floor to eliminate inequality in states, it is argued that state budgets will not be able to support the measures and will downsize benefits, raise copayments, and mandate more coverage. Without normalized indicators for standard assessment of cost outcomes in HCBSs, stakeholders suffer economic inefficiencies with valuable inputs and resources unaccounted for, patients experience increasingly limited access to care in vulnerable populations, and overall quality of life is diminished in the aging process.

There was much discussion in the literature review regarding the expansion of Medicaid programs and the subsequent ruling of the supreme court (Graaf, 2019). An exhaustive review of state programmatic growth and spending after 2010 revealed there were large increases in overall utilization of home -and community-based waiver programs in states. The increasing number of Americans in the over 65 age cohort accounted for this, demographically, but the theme that emerged from the literature after the passage of the 2010 Affordable Care Act was the major variations in state spending, use, and potentially avoidable hospitalizations (PAHs) among Medicaid 1915(c) waiver enrollees (Hermer, 2015; Segelman, Intrator, Li, Mukamel, & Temkin-Greener, 2019) and a notable inability to correlate programs with greater generosity for eligibility with outcomes such as rehospitalization. These conclusions affirmed the problem statement that specified the limited number of studies that indicated any significant associations in

outcomes, such as cost, with increased interventions made by and the expansion of HCBS waiver programs.

Summary

The literature reviewed in Chapter 2 was based on the traditional theories of functionalism, ADL, IADL, and how these functional assessment theories were applied in past studies and implications of use in the current study. Functional assessment as a predictor variable was reviewed, with emphasis on its previous study in home- and community-based settings. The idea of costs as a dependent variable was also discussed in traditional usage throughout the literature and its current usage as a criterion for measurement in Medicaid 1915(c) home- and community-based waiver programs. The notion of aging populations deliberated the results of this exhaustive literature to highlight a gap in the theoretical aging framework that reserved a place for our nation's fastest-aging populations by percentage. Therefore, this notable disparity necessitated that the conclusions of the literature review discuss the lack of emphasis on the coming hyper-aged United States in 2030 by focusing research at the state level.

This gap in the research found in this literature review supported the use of ADL and IADL indicators in home- and community-based Medicaid 1915(c) waiver recipients and highlighted a notable lack of emphasis on costs in the fastest-aging states. Scholarly articles in peer-reviewed journals and textbooks provided a framework to examine known information and develop hypotheses regarding the literature gap with respect to the problem statement, purpose, research questions that included similar conceptual frameworks and variables with similar methodologies. Using ADL and IADL theory in

states with hyper-aging populations exemplifies the impact of the global aging crisis in the U.S. and the ramifications of societal cost, specifically in social insurance programs such as the Medicaid 1915(c) HCBS waiver program. Most importantly, it demonstrates the need for updates in the system of U.S. healthcare to better serve the individual care needs and improve quality of life in our most vulnerable population.

Chapter 3: Research Method

Introduction

The purpose of this study was to analyze the associations found in the independent variables of ADL and IADL on the dependent variable of costs per Medicaid recipient in states experiencing hyper-aging. Delineating states with the highest projected hyper-aging populations and qualifying programs enabled the predictor variables to be assessed in this special population in a way that was not present in the literature. In this chapter I explain the overview of the research methodology and research design that I used in collecting data for the study, analyzing data, and answering the research questions and hypotheses. In this chapter I also explain the design of the study and motivation for its selection, sample size and characteristics, instrumentation, data analysis, ethical considerations, and implications for future research.

Description of Research Design

The study of outcome trajectories in older adults has empirically relied upon an ordered categorical (ordinal) scale that includes a small number of response categories when measuring similar variables (Dohrn, 2015). A systematic literature review (Kojima, Iliffe, Jivraj, & Walters, 2016) revealed functionality is associated with wellbeing in home- and community-based older adults. The results affirmed the Katz (1963) and Lawton and Brody (1969) assessment tools' validity to be utilized in regression models specific to older populations. Similar research designs as the one in this study have been largely employed in this literature and is discussed in Chapter 2

This research design was quantitative and used regression analysis to examine the relationships among predictors variables on costs per recipient. I selected deductive reasoning in quantitative research by defining initial parameters rather than inductive reasoning found in qualitative research because the primary directive of the research problem was to determine which independent variables have the most influence on costs per aged waiver recipient in Medicaid 1915(c) HCBS in states with hyper-aging populations. There are many quantitative methods, but I selected regression analysis after examining the demands of the research questions, hypotheses, and aligning those with the methodology. Regression analysis tested each independent variable in a generalizable population and provided a platform for hypothesizing the problem as it was, offered explanations on current research to further clarify implications of policy outcome standards, and showed how this affects the problem as it will be. Regression analysis was an appropriate selection because of its empirical use in the social sciences when examining expenditures (Gaurav, 2010) such as cost per recipients with the explanatory variables of ADL and IADL.

An evaluation of the problem statement, the research questions, and data collection methods revealed that the correlational, quasi-experimental, and experimental designs that were considered were ultimately discovered to be unfit for the problem statement due to the demands of the problem and the relationship of the variables. The correlational approach is used to study the relationship between two variables, but it does not offer analyses for the observations that occur among the data when two or more variables are involved. In the problem statement I sought to determine which ADL and

IADL are significant in states with hyper-aging populations. Correlational research would have been fitting if there were no established outcome variables in HCBSs or recognized industry standards and the demand for the research was to recognize a pattern. However, in the research I primarily sought to evaluate not only the importance of ADL and IADL analysis in states with hyper-aging populations but also to explain variances within each subscale and determine what inferences from the data can be made to improve the functional vulnerability of the population and its programmatic success.

Quasi-experimental designs are used to establish cause and effect without manipulating the independent variable. The cause-effect relationship was not emphasized in the research methodology planning because functionality in older adults was not singled out by one determinant; therefore, the issue of cause and effect did not weigh heavily in the selection process. Experimental design was also considered but found to be an inappropriate for the study for similar reasons that were reflected in the concerns of quasi-experimental design. Additional concerns outside of the scope of the research would have to have been considered for a quasi-experimental or experimental design to be considered. These approaches would have required an examination of the effect of treatment on control groups, which have not been established in the United States due to changes the effects of which cannot be formally evaluated yet. The purpose of the study was to observe and evaluate the patterns of the levels of ADL and IADL in HCBSs specific to states with hyper-aging populations. The demands of this study surpassed the theoretical perspectives that would be offered in correlational, quasi-experimental, and experimental design.

In the literature review showed regression analysis would serve the study to explain HCBSs policy abroad without becoming engrossed with the mechanics of each average that was studied. These indicators can be studied using hierarchal regression analysis to assess the significance of each subscale of ADL and IADL in states with hyper-aging populations. Univariate analysis is also used to evaluate variables and how they are dispersed in states with hyper-aging populations. Regression analysis allowed for the study to not only present substantial findings in the functionality of ADL and IADL, it also verified the significance of items within each subdomain by ranking importance, and presented findings that targeted most needed improvement areas in cost per recipient found in states with hyper-aging populations.

Modern research designs in the literature present an absence of methodological standards while demonstrating the need for advanced research on determinants of future cost effectiveness found in states with hyper-aging populations with qualifying HCBS programs (Wysocki et al., 2015). The overarching framework for the research employed the dynamic role of state, social, and market forces in the creation and administration of health policy suggested by Stamati and Baeten (2015). Cost-effective indicators were quantified by Bakx, Meijer, Schut, and van Doorslaer (2015) using established variables to generalize policy measures in HCBSs settings. Public expenditures and prior utilization were significant among the predictor variables; other variables included financial stability, emotional and physical health, and general factors contributing to the well-being of the family and stakeholders (Mclean et al., 2015). Frameworks that include

outcome variables with significance in HCBS policy (Bakx et al., 2015) synthesize with the current research framework and extend it to states with hyper-aging populations.

Quantitative methodology was the most suitable approach for the study due to the demand of extracting, compiling, and synthesizing large amounts of information from the MAX data. Similar methodology evaluating predictors in older adults found that research should be extended when evaluating age in geriatric populations (Muszalik et al., 2015). Specifically, this research addresses the costs of programmatic spending in finite aging cohorts, such as those in states with hyper-aging populations. Qualitative research would not have enabled the study to examine the effects of the predictor variables in populations with specified parameters such as the hyper-aging segment of the U.S. home- and community-based Medicaid 1915(c) aged waiver program.

Research by Brown et al. (2015) used multivariate regression to analyze the influence of similar predictor variables and mortality in older adults. Conclusions revealed that regression analysis of predictors in short-term and long-term mortality rates found in older adults and the value of these predictor variables in the functional assessment and preventative measures should be further researched. ADL and IADL have become imperative in home- and community-based studies, and their emphasis as quality indicators in this quantitative research study improved the understanding of cost effectiveness associated within states with hyper-aging populations with 1915(c) Medicaid aged waiver recipients.

Inferential reasoning is used in quantitative theory with observable phenomena in data, thus making it a fitting method to test the Katz et al. (1963) and Lawton and Brody

(1969) models in states with hyper-aging populations with a qualifying Medicaid 1915(c) HCBS aged waiver. Systemic review of 102 similar measurements in the MEDLINE and EMBASE data revealed the need for improved assessment of older adults in home- and community-based care including instrumentation and data synthesis (Terwee et al., 2015). Naylor et al. (2015) later noted a lack of predictor variables associated with costs in the research of the oldest-old cohorts. This lack in indicators was addressed in this study by considering the ADL and IADL subdomains as indicators of cost-effectiveness or lack thereof in states with hyper-aging populations.

Quantitative nonexperimental methods enable the researcher to thoroughly harvest exhaustive data gathered by detailed surveys, comprehensive interviews, and assess the relationships of variables, hypotheses, and research questions (Creswell, 2014). The hypotheses and research questions progressed from the literature review from basic aging populations to states containing the fastest-aging populations. Experimental research was considered as a potential methodology in the current study. The predictor variables of ADL and IADL ultimately do not need to provide absolute certainty found in experimental research of cause-and-effect relationships and are unable to be manipulated. Nonexperimental research in the study allowed for the observation and interpretation of the dependent variables that are uncontrollable, such as age. A quantitative research design using regression analysis permitted the examination of statistical significance of the predictor variables on the outcome variable.

The study advances understanding on associations among the variables: (a) ADL and IADL, (b) cost per waiver recipient (c) Medicaid 1915 HCBS Aged Waiver, and (d)

states with hyper-aging populations. The variables in the study were modeled in relation to the directing hypotheses that assessed the significance of ADL and IADL indicators in states with hyper-aging populations with qualifying Medicaid 1915(c) HCBS aged waiver recipients. The guiding research question was: Can statistical significance in ADL and IADL be associated with average costs per Medicaid 1915(c) aged recipient in Alaska, Nevada, and Utah? Qualitative methodology and inductive reasoning did not align with the purpose of the study and failed to describe statistics involved in the explanation of variables in the research questions, subquestions, and hypotheses.

The study incorporated the methodological assumptions found in deductive reasoning of quantitative research (Creswell, 1994), which utilizes established theory to make inferences in the research process about specific populations using basic established principles. Data was analyzed using descriptive statistics, observed generalizations were made, and a detailed theory for the applicable population was framed using experience-based evidence (Teddlie & Tashakkori, 2009). This postpositivist model is explained in the theoretical framework found in Chapter 1 and is nonexperimental research considered practical for this study due to (a) the demands of quantifying statewide data from the national MAX database and the inability to personally administer the ADL and IADL surveys; (b) the need to examine the statistical relationships of each ADL and IADL indicators and isolate most significant variables each subscale; (c) the need from the research questions to identify relationships and objectively answer and/or ordinally rank most significant variables using interpretations of descriptive research; (d) the capability to examine theory and hypotheses; and (e) the

ability to deduce from this sample of the fastest-aging states and provide generalizable conclusions. The methodological assumptions and the research design allowed for time and objective limits to be considered while building a reliable and valid knowledge base.

The study used a nonexperimental design for data collection. The MAX database is an economical means of analysis in the construction of a sample population that allows for parameters to be set when gathering programmatic statewide cost per recipient data concerning age cohorts for comparison hyper-aged states. Vann, Feaganes, and Wegner (2007) examined the reliability of the CMS database when compared to medical record data and concluded that use of multiple data sources along with external validation can be used to identify temporal relationships between treatment and outcome.

Research Questions, Subquestions, Hypotheses, and Assessments

This quantitative study examined the relationship of ADL and IADL and cost and assessed their significance in hyper-aging HCBS populations using 1915(c) Medicaid waivers in Alaska, Nevada, and Utah. Seventeen directional research sub questions were developed along with the examination methods and hypothesis. Not all research questions, subquestions, and hypotheses were used in the data analysis due to inconsistencies and incompletions in the de-identified data files.

IVs: ADL)and IADL.

DV: Cost of care per recipient.

Control Variables: age, gender, ethnicity, race, previous occupation, level of education attained, average level of adult income, geographic origin, and number of years married, if any.

Activities of Daily Living Model

Research Question 1 and Subquestions

RQ1: What functionality levels found in ADL, if any, are most significant in Alaska, Nevada, and Utah when using the Katz ADL Scale to calculate overall significance of cost per recipient in Medicaid 1915(c)?

$H_0$1: ADL, as measured by the Katz ADL questionnaire, are not significant predictors of cost per Medicaid 1915(c) home -and community-based recipient in Alaska, Nevada, and Utah.

H_a1: ADL, as measured by the Katz ADL questionnaire, are significant predictors of cost per Medicaid 1915(c) home -and community-based recipient in Alaska, Nevada, and Utah.

Assessment. Multivariate regression will be used to determine the significance of ADL on cost per home-and community-based Medicaid aged waiver recipient found in Alaska, Nevada, and Utah. ADL are measured by the Katz ADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ1a: Does a relationship exist between the level of functionality in bathing, a subdomain of the ADL scale as measured by the Katz bathing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$1a: There is no relationship between the level of functionality in bathing, a subdomain of the ADL scale as measured by the Katz bathing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a1sq1: There is a relationship between the level of functionality in bathing, a subdomain of the ADL scale as measured by the Katz bathing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess bathing and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah. Bathing is measured by the Katz ADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ1b: Does a relationship exist between the level of functionality in dressing, a subdomain of the ADL scale as measured by the Katz dressing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$1b: There is no relationship between the level of functionality in dressing, a subdomain of the ADL scale as measured by the Katz dressing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a1b: There is a relationship between the level of functionality in dressing, a subdomain of the ADL scale as measured by the Katz dressing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess dressing and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah. Bathing is measured by the Katz ADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ1c: Does a relationship exist between the level of functionality in toileting, a subdomain of the ADL scale as measured by the Katz toileting subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$1c: There is no relationship between the level of functionality in toileting, a subdomain of the ADL scale as measured by the Katz toileting subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a1c: There is a relationship between the level of functionality in toileting, a subdomain of the ADL scale as measured by the Katz toileting subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess toileting and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah. Bathing is measured by the Katz ADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ1d: Does a relationship exist between the level of functionality in transferring, a subdomain of the ADL scale as measured by the Katz bathing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$1d: There is no relationship between the level of functionality in transferring, a subdomain of the ADL scale as measured by the Katz bathing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a1d: There is a relationship between the level of functionality in transferring, a subdomain of the ADL scale as measured by the Katz bathing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess transferring and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah. Bathing is measured by the Katz ADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ1e: Does a relationship exist between the level of functionality in continence, a subdomain of the ADL scale as measured by the Katz continence subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$1e: There is no relationship between the level of functionality in continence, a subdomain of the ADL scale as measured by the Katz continence subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a1e: There is a relationship between the level of functionality in continence, a subdomain of the ADL scale as measured by the Katz continence subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess continence and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah.

Bathing is measured by the Katz ADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ1f: Does a relationship exist between the level of functionality in feeding, a subdomain of the ADL scale as measured by the Katz continence subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$1f: There is no relationship between the level of functionality in feeding, a subdomain of the ADL scale as measured by the Katz continence subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a1f: There is a relationship between the level of functionality in feeding, a subdomain of the ADL scale as measured by the Katz continence subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess feeding and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah. Bathing is measured by the Katz ADL Scale. Costs per recipient are measured as a constant variable by MAX.

Instrumental Activities of Daily Living Model

Research Question 2 and Subquestions

RQ2: What functionality levels found in IADL, if any, are most significant in Alaska, Nevada, and Utah when using the Lawton IADL Scale to calculate overall significance on cost per Medicaid 1915(c) recipient?

$H_0$2: Instrumental ADL, as measured by the Lawton IADL Scale, are not significant predictors of cost per Medicaid 1915(c) home -and community-based recipient in Alaska, Nevada, and Utah.

H_a2: Instrumental ADL, as measured by the Lawton IADL Scale, are significant predictors of cost per Medicaid 1915(c) home -and community-based recipient in Alaska, Nevada, and Utah.

Assessment. Multivariate regression will be used to determine the significance of IADL on cost per home-and community-based Medicaid aged waiver recipient found in Alaska, Nevada, and Utah. ADL are measured by the Lawton IADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ2a: Does a relationship exist between the level of functionality in the ability to use a telephone, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$2a: There is no relationship between the level of functionality in the ability to use a telephone, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a2a: There is a relationship between the level of functionality in the ability to use a telephone, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess use of a telephone and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada,

and Utah. Bathing is measured by the Lawton IADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ2b: Does a relationship exist between the level of functionality in the ability to go shopping, a subscale of IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$2b: There is no relationship between the level of functionality in the ability go shopping, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a2b: There is a relationship between the level of functionality in the ability to go shopping, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess ability to go shopping and cost per Medicaid 1915(c) HCBS aged waiver recipient in s Alaska, Nevada, and Utah. Bathing is measured by the Lawton IADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ2c: Does a relationship exist between the level of functionality in food preparation, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$2c: There is no relationship between the level of functionality in food preparation, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a2c: There is a relationship between the level of functionality in food preparation, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess food preparation and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah. Bathing is measured by the Lawton IADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ2d: Does a relationship exist between the level of functionality in housekeeping, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$2d: There is no relationship between the level of functionality in housekeeping, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a2d: There is a relationship between the level of functionality in housekeeping, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess functionality in housekeeping and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah. Bathing is measured by the Lawton IADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ2e: Does a relationship exist between the level of functionality in the ability to do laundry, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$2e: There is no relationship between the level of functionality in the ability to do laundry, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a2e: There is a relationship between the level of functionality in the ability to do laundry, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess ability to do laundry and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah. Bathing is measured by the Lawton IADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ2f: Does a relationship exist between the level of functionality in mode of transportation, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$2f: There is no relationship between the level of functionality in mode of transportation, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a2f: There is a relationship between the level of functionality in mode of transportation, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess mode of transportation and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah. Bathing is measured by the Lawton IADL Scale. Costs per recipient are measured as a constant variable by MAX.

SQ2g: Does a relationship exist between the level of functionality in the ability to administer medications, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$2g: There is no relationship between the level of functionality in the ability to administer medications, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a2g: There is a relationship between the level of functionality in the ability to administer medications, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess medication administration and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah. Bathing is measured by the Lawton IADL Scale. Costs per recipient are measured as a constant variable by MAX.

SG2h: Does a relationship exist between the level of functionality in the ability to manage finances, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

$H_0$2h: There is no relationship between the level of functionality in the ability to manage finances, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

H_a2h: There is a relationship between the level of functionality in the ability to manage finances, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah.

Assessment. The correlation coefficient R will be used to assess financial management and cost per Medicaid 1915(c) HCBS aged waiver recipient in Alaska, Nevada, and Utah. Bathing is measured by the Lawton IADL Scale. Costs per recipient are measured as a constant variable by MAX.

Operational Definitions

The primary research question was which functional indicators are most significant in hyper-aging home- and community-based Medicaid populations. The operational definitions of variables included in this study are listed below:

Independent Variables

ADL are an independent variable that includes the explanatory variables of bathing, dressing, toileting, transferring continence, and feeding. The total significance of

ADL is measured using the standardized aggregate scoring methodology found in the Katz ADL Scale (1963). IADL include the ability to use a phone, shopping, food preparation, housekeeping, laundry, mode of transportation, responsibility for medication, and ability to handle finances. ADL and IADL are expressed as categorical variables because of the weighted significance found in each subscale that may be coded quantitatively in the results.

Dependent Variable

The dependent variable of the study is cost per recipient in states with hyper-aging populations. Increased or decreased cost was not included as part of the research questions because total effect on increased or decreased costs by independent variables can be assessed using the hypotheses of the research questions. Cost per recipient is measured in U.S. dollars (USD) by extracted data from the MAX.

Control Variables

Age, gender, ethnicity, race, previous occupation, hours worked weekly, level of education attained, average level of adult income, geographic origin, and number of years married, if any.

Target Population

The target population consisted of 1915(c) HCBS Aged Medicaid recipients in Alaska, Nevada, and Utah in the United States. These states were selected because they held the fastest growing aging populations in the nation from 2007-2017 (AoA, 2018) and are therefore classified as states with hyper-aging populations. These states were also states that offered a Medicaid 1915(c) aged waiver program and had enough qualifying

beneficiaries to be selected for inclusion as required by the population requirements. These state Medicaid programs represent other similar 1915(c) programs throughout the U.S. but contain the nation's largest concentration of elderly. Therefore, it is generalizable for current similar states that meet the qualifiers for the target population and are soon to become hyper-aged states.

Sample and Sampling Procedure

The study sample is drawn from the current MAX) database of qualifying beneficiaries, available to the public at the CMS website at https://www.cms.gov. The CMS indicated in 2012 1,887 Medicaid Section 1915(c) Type H aged beneficiaries in Alaska, 2,234 in Nevada, and 589 in Utah. The sample was selected from states that (1) contained one of the fastest growing aging populations based on overall percentage growth from 2000-2011 and (2) had recipients of the Type H Waiver. The general power analysis program (G*Power) 3.1.9.2 recommended a minimum of 89 beneficiaries to be randomly selected from the total population of 4,710 to assess significance. To ensure states are weighted equally, analyses will include 89 beneficiaries from each state and assess the sample size percentage of each state when compared to the total sample size. Alaska represents 40% of the total population, Nevada represents 47%, and Utah represents 13%. The sample size was examined using multivariate analysis and the correlation coefficient R established any possible relationships among the variables in the research questions. This sampling procedure applied 95% power and a significance of 0.05 using a 0.15 effect size found in earlier research.

Instrumentation

The instrumentation for the study was financial data collected from the 2012 Medicaid Personal Summary (PS) deidentified files and functional assessments were gathered from the Home Health Outcome and Assessment Information Set (OASIS) from 2016. These data sets included Katz Activities of Daily Living Scale, (b) the Lawton Instrumental Activities of Daily Living Scale, and (c) demographic statistics about the population. The selected parameters are applicable to any possible associations with ADL and IADL and cost in 1915(c) HCBS Medicaid recipients. The Katz ADL contains a total of 6 items, and the Lawton IADL consists of 8 items. The process of data collection and management utilized the Statistical Package for the Social Sciences (SPSS).

Instruments

The Katz Activities of Daily Living Scale

The Katz Activities of Daily Living Scale (Katz, 1963) assesses the level of independence and dependence of an individual. The scale contains approximately 6 items that include bathing, dressing, toileting, transferring, continence, and feeding and consists of one equation for each of the six subscales which are expressed by the average level of independence or dependence experienced with each component. Each activity will score either one point or zero to represent independence and dependence, respectively. The total score of an individual may range from zero (independence) to six (dependence). Independence indicates no supervision or assistance is required with the activity. Dependence indicates supervision or assistance is required with the activity. The 6-item questionnaire measures the overall functional status and is completed by proxy

respondent. The ADL scale and is valuable to the study due to its concise nature and brevity in the study of aging.

Lawton Instrumental Activities of Daily Living Scale

The Lawton Instrumental Activities of Daily Living (IADL) Scale (Lawton and Brody, 1969) assesses functionality in more complex ADL required for independent living. The scale contains 8 items: ability to use phone, shopping, food preparation, housekeeping, laundry, mode of transportation, responsibility for medication, and ability to handle finances. Each subscale has three to five items that are scored either 0 or 1. The summary score ranges from low functioning dependent (0) to high functioning independent (8) for women and zero to five for men, excluding food preparation, housekeeping and laundering. The 8-item questionnaire is completed by proxy respondent. The Lawton IADL is relevant to the research because it can examine tasks required in the functionality of independent individuals that is not available in the Katz ADL measure.

Demographics

The study analyzed demographic items that were completed by proxy respondent in the MAX and OASIS data. The deidentified data files included many demographic determinants of individual respondents but the primary focus of the study emphasized age over other discriminators. Discriminators included age cohort, gender, sex, ethnicity, and geographical information. The choice of *other* was be given to respondents in some of the survey questions. Therefore, the beneficiary identification contained incomplete information and some recipients could not be considered for inclusion. All questions

included a blank circle for proxy respondents to select the appropriate choice. An example of the ADL and IADL questionnaires are provided in Chapter 1.

Data Collection and Procedures

After application and successful completion of the approval process by the Walden Institutional Review Board (approval number 06-25-18-0367526), a list of Medicaid recipients was ordered from the most recent year available. The total length of the data acquisition process was approximately 18 months and was accessed by files sent from the Research Data Assistance Center, a data subcontractor of the CMS. This list was collected from data reported by home health agencies across the country, compiled by the CMS and was purchased for $6500. Beneficiaries were randomly selected and then cross-referenced using beneficiary identification numbers to collect information on predictors and the dependent variable.

Informed Consent

Conditions for beneficiary participation in the Medicaid 1915(c) programs were explained by health and medical providers who engaged the recipients in the data collection process at the time of service while acting as proxy respondents. Beneficiary information was since deidentified before any research data was turned over to Walden University and made available to the public as part of a taxpayer funded social insurance program. To qualify, those beneficiaries who had their assessment completed by a proxy respondent and had to meet the required criteria of: residence in Alaska, Nevada, or Utah, a recipient of a Medicaid 1915(c) HCBS Aged waiver program within the state, and aged 65 or over.

Data Analysis Procedures

After the data was gathered, SPSS and Microsoft Excel were utilized for analysis. Recipient information had to be complete and not partially incomplete for inclusion into the representative sample. Beneficiaries with incomplete data files were excluded from candidacy in the representative sample. Advised guidelines for analysis using similar quantitative measures were consulted using Cohen et al. (2013). Only beneficiaries from qualifying programs in Alaska, Nevada, and Utah were included in the study. Assessment items unable to be included due to incomplete data will be described in Chapter 4. Multivariate analysis and the correlation coefficient R assessed the levels of reliability of the ADL and IADL measures. Explanatory variables of the population demonstrated scores for the mean (μ) and standard deviation (σ). Cronbach's alpha (α) reported reliability statistics of each scale used in the analysis. Multiple linear regression tested and ranked the significance and values of each subscale. Population demographic discriminators such as age and gender will be included in the regression analysis but not in the hypotheses to make generalizable conclusions about variances between levels of functionality of each item.

Limitations

Limitations for this study are factors, both implicit and explicit, that are outside the parameters of the research that vary from the individual to the organization, provider, state, and environment. Aged waiver recipients from the Medicaid 1915(c) programs are included from home- and community-based populations from Alaska, Nevada, and Utah. Reporting home health agencies have organizational policy and administration

procedures that will vary per provider rules and regulations and also state regulations that are specific to and apply only to that specific program. Other unknown procedural factors may influence the administration of program resources. Therefore, the study will be unique and may not be generalizable to all similar home-and community-based populations in the United States and around the globe.

Summary

A quantitative research design best fits the demands of examining significance within ADL and IADL on cost per recipient in hyper-aging home-and community-based aged populations. Data collection and statistical analysis using regression, correlative, and descriptive statistics will be managed by the SPSS. Discriminators in the demographic population data are demonstrated in study findings and enable information about beneficiary characteristics as well as the level of significance per each respective variable. Chapter 4 will discuss data results and analysis.

Chapter 4: Results

Introduction

In Chapter 4 I examine relationships of ADL and IADL on cost of care per recipient in Medicaid home- and community-based waiver enrollees. I requested data from Alaska, Nevada, and Utah from the CMS data contractor Research Data Assistance Center to report ADL, IADL, and cost per recipients from patients in the field. Two research questions were responsible for guiding the study. Nine research subquestions supported the analyses as well as their equivalent directional hypotheses. De-identified data sets from the CMS provided correlational, descriptive, and regression information with respect to significance found in relationships of the variables. In this chapter I discuss the results from the analyses of the variables in the research questions and hypotheses as well as the impact of control variables after the data collection process

Data Collection

Descriptive Statistics

A total of 267 Medicaid 1915(c) HCBS waiver recipients were required by G*Power to assess for significance in hyper-aging populations in the United States. Two different data sets were requested due to the nature of the information required to assess for significance in the variables. The Chronic Conditions Warehouse (CCW) packaged and transferred files from the MAX personal summary (PS) files, which were used to access the total annual cost of care of the beneficiary. There were 114 recipients from Alaska, 338 from Nevada, and 112 from Utah sent in the 2012 MAX PS files. The beneficiary identification sequences from the MAX were then randomized, selected, and

then cross-referenced with 260,806 patients from Alaska, Nevada, and Utah in the 2016 OASIS data required to be completed by home health agencies (HHAs), which contains information regarding the independent variables of ADL and IADL. Twenty-seven patients with incomplete or partially reported data in the OASIS were eliminated.

Gender analysis revealed more total females (82.8%) when compared to male patients (17.2%). There were 17 males and 72 females from Alaska, 14 males and 75 females from Nevada, and 15 males and 74 females from Utah when 89 beneficiaries were randomly selected from each state. Most of the beneficiaries were from the age group 75-84 (43.8%). There were beneficiaries from three different age groups: 65 to 74 (42.6%) which are the young-old, 75 to 84 (43.8%) which represent the middle-old, and 85 and over (13.5%) that represent the oldest-old. In total, 114 were aged 65-74 with 39 from Alaska, 40 from Nevada, and 35 from Utah. One hundred and seventeen beneficiaries were aged 75 to 84 with 40 from Alaska, 37 from Nevada, and 40 from Utah. The sample also included 36 patients aged 85 and above with 10 from Alaska, 12 from Nevada, and 14 from Utah.

The CMS and Research Data Assistance Center contractors indicated during the request process that all independent and control variables may not be included in the request but dependent variables could be verified as being included before the data request. The data sets did not report any information on the control variables of previous occupation, hours worked weekly, level of education attained, average level of adult income, geographic origin, and number of years married, if any. Included control variables found in the data were: age, gender, ethnicity, and race. There were no analyses

conducted on incomplete or missing items in control variables. Other recipients were randomly selected to replace patients that did not fully report information in the control variables.

Raw data from the CCW did not include total age in years, so that number had to be converted into years, months, and days. Those conversions were then calculated in Microsoft Excel to formulate total age in years. Special considerations had to be made when calculating the total age of the patient. This was done by calculating the last known information attained in the OASIS data in 2016 and then matching the beneficiary identification sequence in the OASIS data financial costs on the 2012 MAX PS. After much deliberation, it was determined by CMS data contractors and tme, this was the only way to assess costs and functionality due to those data sets being the most recent data sets available.

Using the current date when the analyses were conducted could not account for unknowns in current patient status that included but were not limited to being deceased. Therefore, descriptive statistics involving total age would not be accurate when using the current date in calculating total age. Total mean age of patients sent in the MAX PS batch file was 79.8 years. In Alaska, 79.38 was reported as the mean age, Nevada reported 79.89, and Utah reported 80.13. Patients selected for analysis from each group in the MAX PS data set included a mean total age of 79.24. Randomly selected patients from Alaska reported a mean age of 78.25, Nevada reported a mean age 79.28, and Utah reported a mean age of 80.21 years.

Race and ethnicity were universally coded by the CMS in both data sets using numbers one through nine: 1. White (not of Hispanic origin) 2. Black (not of Hispanic origin) 3. American Indian or Alaskan Native 4. Asian or Pacific Islander 5. Hispanic 6. Native Hawaiian or other Pacific Islander 7. Hispanic or Latino and more than one race 8. More than one race (Hispanic or Latino not indicated) 9. Unknown. Alaska reported 59 beneficiaries as Code 1 or 66.2%, one beneficiary as Code 2 or 1.1%, nine beneficiaries as Code 3 or 10.11%, five as Code 4 or 5.6%, five as Code 5 (5.6%), five as Code 6 (5.6%), and five as Code 9 (5.6%). Nevada reported 60 beneficiaries as Code 1 (67.4), 16 beneficiaries as Code 2 (17.9%), one as Code 3 (1.1%), two as Code 4 (2.2%), nine as Code 7 (10.11%), and one as Code 8 (1.1%). Utah reported 80 beneficiaries as Code 1 or 89.8%, one as Code 2 (1.1%), three beneficiaries as Code 3 (3.3%), two as Code 4, one as Code 6 (1.1%), and one as Code 7 (1.1%).

The total sample (*N*= 267) of the three states, 74.5% identified as White being not of Hispanic origin. There were 6.74% identified as Black being not of Hispanic Origin. A total of 4.9% identified as American Indian or Alaskan Native, and 3.4% identified as Asian or other Pacific Islander. There were 1.89% identified as Hispanic, 2% identified as Native Hawaiian or other Pacific Islander, 3.75% identified as Hispanic or Latino and more than one race, 0.4% identified as more than one race (Hispanic or Latino not indicated), and 1.9% identified as unknown.

Table 2

Frequencies and Percentages for Demographics

Demographic	*n*	%
Gender		
Alaska		
Female	72	81
Male	17	19
Nevada		
Female	75	84
Male	15	16
Utah		
Female	74	83
Male	15	17
Total	267	100
Age		
Alaska		
65-74	39	14.6
75-84	40	14.9
85 and over	10	3.7
Unknown/Error	0	0
Nevada		
65-74	40	14.9
75-84	37	13.8
85 and over	12	4.5
Unknown/Error	0	0
Utah		
65-74	35	13.1
75-84	40	14.9
85 and over	14	5.2
Unknown/Error	0	0
Total	267	100

(tables continues)

Demographic		
Race and/or ethnicity		
Alaska		
White (not of Hispanic origin)	59	22
Black (not of Hispanic origin)	1	0.4
American Indian or Pacific Islander	9	3.4
Asian or Pacific Islander	5	1.9
Hispanic	5	1.9
Native Hawaiian or other Pacific Islander	5	1.9
Hispanic or Latino and one or more races	0	0
More than one race (Hispanic or Latino not indicated)	0	0
Unknown	5	1.9
Nevada		
White (not of Hispanic origin)	60	22.5
Black (not of Hispanic origin)	16	6
American Indian or Pacific Islander	1	0.4
Asian or Pacific Islander	2	0.8
Hispanic	0	0
Native Hawaiian or other Pacific Islander	0	0
Hispanic or Latino and one or more races	9	3.4
More than one race (Hispanic or Latino not indicated)	1	0.4
Unknown	0	0
Utah		
White (not of Hispanic origin)	81	30.3
Black (not of Hispanic origin)	1	0.4
American Indian or Pacific Islander	3	1.2
Asian or Pacific Islander	2	0.8
Hispanic	0	0
Native Hawaiian or other Pacific Islander	1	0.4
Hispanic or Latino and one or more races	1	0.4
More than one race (Hispanic or Latino not indicated)	0	0
Unknown	0	0
Total	267	100

The CCW and CMS confirmed that items 2, 6, and 8 on the Lawton IADL scale were not included in the requested data SET due to missing and/or incomplete information reported by healthcare facilities. This information was not included in the OASIS data set, rendering certain independent variable testing inconclusive and those questions were removed from the study:

- 2. Does a relationship exist between the level of functionality in the ability to go shopping, a subscale of IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?
- Does a relationship exist between the level of functionality in mode of transportation, a subscale of IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?
- Does a relationship exist between the level of functionality in the ability to manage finances, a subscale of IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

Three subquestions numbered 2, 3, and 5 were included in the comprehensive assessment item number four, titled “Prior Functioning ADL/IADL - Household Tasks” found in the OASIS data set. That assessment item included meal preparation, laundry, and shopping and the three inclusive subquestions were not analyzed as separate items:

- 2. Does a relationship exist between the level of functionality in the ability to go shopping, a subscale of IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

- Does a relationship exist between the level of functionality in food preparation, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?
- Does a relationship exist between the level of functionality in the ability to do laundry, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

Nine composite scores were used from the Katz ADL and Lawton IADL to assess independent variables of functionality in hyper-aging states using dressing, bathing, toileting, toileting hygiene, transferring, feeding, use of a telephone, shopping, and medication management. One score was used to assess the outcome variable of total Medicaid HCBS 1915(c) payments made; both indices reported values developed by the standardized MAX and OASIS data. Tables 3 and 4 present the statistical reliability and predictability of these scores:

Table 3

Reliability Statistics

Function	Mean	Std. deviation (*SD*)	*N*
Bathing	3.54	1.46	172
Dressing	2.15	0.734	172
Toileting	1.56	1.285	172
Transferring	1.83	1.082	172
Toileting Hygiene	1.91	0.936	172
Feeding	0.95	0.756	172
Telephone Use	1.58	1.809	172
Household Tasks	1.48	0.616	172
Medication Management	2.1	1.058	172
Medicaid Payments Total	1.02	1.615	172

Table 4

Reliability Statistics

Cronbach's α	Cronbach's α based on standardized items	*N* of items
0.86	0.886	10

Research Question 1

RQ1: What functionality levels found in ADL, if any, are most significant in Alaska, Nevada, and Utah when using the Katz ADL Scale to calculate predictions on cost per Medicaid 1915(c) recipient?

Linear combination regression assessed the relationship between Katz ADL items and cost per Medicaid 1915(c) recipient. Results of the correlation revealed a weak significant relationship, $r = .33$, and p values were over 0.005. Findings suggest as Katz scores increase, there is a weak positive correlation in costs per Medicaid 1915(c) recipient.

Table 5

Combination Regression Analysis of Katz Activities of Daily Living and Cost per Medicaid 1915(c) Aged Waiver Recipient

Model	R	R^2	Adjusted R^2	SE
Katz ADL	.328[a]	0.101	0.077	1.47

ADL Item	P Values
Bathing	.049
Dressing	.750
Toileting	.928
Toileting Hygiene	.529
Transferring	.685
Feeding	.012

Research Subquestion 1a

SQ1a: Does a relationship exist between the level of functionality in bathing, a subdomain of the ADL, scale as measured by the Katz bathing subscale, and costs per Medicaid 1915(c) Aged Waiver recipient in Alaska, Nevada and Utah?

Linear regression was used to determine there was a relationship between bathing and total costs per Medicaid 1915(c) Aged Waiver recipient. The results of the correlation showed there was a weak positive relationship between bathing. Bathing could not be considered a strong predictor of overall costs, $r = .25$, $p < .005$ as seen in Table 6 below.

Table 6

Linear Regression between Bathing and Cost per Medicaid 1915(c) Aged Waiver Recipient

Model	R	R^2	Adjusted R^2	SE	*p* value
Bathing	.254[a]	0.064	0.061	1.459	0.000

a. Predictors: (Constant), current ability to bathe entire body safely

Research Subquestion 1b

SQ1b: Does a relationship exist between the level of functionality in dressing, a subdomain of the ADL, scale as measured by the Katz bathing subscale, and costs per Medicaid 1915(c) Aged Waiver recipient in Alaska, Nevada and Utah?

Linear regression was used to determine there was a relationship between dressing and total costs per Medicaid 1915(c) Aged Waiver recipient. The results of the correlation showed there was a weak positive relationship between dressing and costs,

but dressing was not a strong predictor of cost, $r = .22$, $p < .005$ as seen in the Table 7 below.

Table 7

Linear Regression between Dressing and Cost per Medicaid 1915-C Recipient

Model	R	R^2	Adjusted R^2	SE	*p* value
Dressing	.217[a]	0.047	0.044	1.147	0.000

a. Predictors: (Constant), indicates the patient's current ability to dress safely.

Research Subquestion 1c

SQ1c: Does a relationship exist between the level of functionality in toileting, a subdomain of the ADL, scale as measured by the Katz bathing subscale, and costs per Medicaid 1915(c) Aged Waiver recipient in Alaska, Nevada and Utah?

Linear regression was used to determine there was a relationship between toileting and total costs per Medicaid 1915(c) Aged Waiver recipient. The results of the correlation showed there was a weak positive relationship between toileting and costs but toileting was not a strong predictor of cost, $r = .21$, $p < .005$ as seen in the Table 8 below:

Table 8

Linear Regression Between Dressing and Cost per Medicaid 1915-C Recipient

Model	R	R^2	Adjusted R^2	SE	*p*value
Toileting	.209a	0.044	0.040	1.475	0.001

a. Predictors: (Constant), indicates the patient's current ability to get to and from toilet or bedside commode safely and transfer on and off toilet/commode.

Research Subquestion 1d

SQ1d: Does a relationship exist between the level of functionality in transferring, a subdomain of the ADL, scale as measured by the Katz bathing subscale, and costs per Medicaid 1915(c) Aged Waiver recipient in Alaska, Nevada and Utah?

Linear regression was used to determine there was a relationship between transferring and total costs per Medicaid 1915(c) Aged Waiver recipient. The results of the correlation showed there was a weak positive relationship between transferring and costs but transferring was not a strong predictor of cost, $r = .20$, $p < .005$ as seen in the Table 9 below:

Table 9

Linear Regression Between Transferring and Cost per Medicaid 1915-C Recipient

Model	R	R^2	Adjusted R^2	SE	*p* value
Transferring	.201a	0.040	0.036	1.540	0.002

a. Predictors: (Constant), indicates the patient's ability to move safely from bed to chair, or ability to turn and position self in bed if patient is bedfast.

Research Subquestion 1e

SQ1e: Does a relationship exist between the level of functionality in toileting hygiene, a subdomain of the ADL, scale as measured by the Katz bathing subscale, and costs per Medicaid 1915(c) Aged Waiver recipient in Alaska, Nevada and Utah?

Linear regression was used to determine there was a relationship between transferring and total costs per Medicaid 1915(c) Aged Waiver recipient. The results of

the correlation showed there was a weak positive relationship between toileting hygiene and costs but toileting hygiene was not a strong predictor of cost, $r = .19$, $p < .005$ as seen in the Table 10 below:

Table 10

Linear Regression Between Toileting Hygiene and Cost per Medicaid 1915-C Recipient

Model	R	R^2	Adjusted R^2	SE	*p* value
Toileting Hygiene	.194[a]	0.038	0.034	1.449	0.002

a. Predictors: (Constant), indicates the patient's ability to safely maintain hygiene of the genitalia and perineum area.

Research Subquestion 1f

SQ1f: Does a relationship exist between the level of functionality in feeding, a subdomain of the ADL, scale as measured by the Katz feeding subscale, and costs per Medicaid 1915(c) Aged Waiver recipient in Alaska, Nevada and Utah?

Linear regression was used to determine there was a relationship between feeding and total costs per Medicaid 1915(c) Aged Waiver recipient. The results of the correlation showed there was a weak positive relationship between feeding and costs but feeding was not a strong predictor of cost, $r = .28$, $p < .005$ as seen in the Table 11 below:

Table 11

Linear Regression between Feeding and Cost per Medicaid 1915-C Recipient

Model	R	R^2	Adjusted R^2	SE	*p* value
Feeding	.275[a]	0.076	0.072	1.483	0.000

a. Predictors: (Constant), This field indicates the patient's current ability to feed self-meals and snacks safely.

Research Question 2

RQ2: What functionality levels in IADL, if any, are most significant in Alaska, Nevada, and Utah when using the Lawton IADL Scale to calculate overall significance on cost per Medicaid 1915(c) recipient?

Linear combination regression assessed the relationship between Lawton ADL items and cost per Medicaid 1915(c) recipient. The results of the correlation revealed a weak positive linear relationship and did not suggest a strong relationship $r = .31$, $p < .005$ as seen in Table 12:

Table 12

Linear Combination Regression between Lawton Instrumental Activities of Daily Living and Cost per Medicaid 1915-C Recipient

	R	R^2	Adjusted R^2	SE	P Value
Lawton IADL	.312[a]	0.098	0.082	1.352	0.001

a. Predictors: (Constant), This field indicates the patient's current ability to prepare and take medications reliably and safely. It also indicates the patient's usual ability with the everyday activity of household tasks (e.g. light meal preparation, laundry, shopping) prior to this current illness, exacerbation, or injury. It also indicates the patient's current ability to answer the phone safely, including dialing numbers, and effectively using the telephone to communicate.

Function	*p* value
Telephone use	0.480
Household tasks	0.098
Medication management	0.012

Research Subquestion 2a

SQ2a: Does a relationship exist between the level of functionality in the ability to use a telephone, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

Linear regression was used to determine there was a relationship between telephone use and total costs per Medicaid 1915(c) Aged Waiver recipient. The results of the correlation were not significant, as telephone could not be considered a strong predictor of overall costs, $r = .22$, $p < .005$ as seen in the Table 13 below:

Table 13

Linear Regression between Telephone Use and Cost per Medicaid 1915-C Recipient

Model	R	R^2	Adjusted R^2	SE	*p* value
Telephone Use	.221[a]	0.049	0.044	1.319	0.001

a. Predictors: (Constant), This field indicates the patient's current ability to answer the phone safely, including dialing numbers, and effectively using the telephone to communicate.

Research Subquestion 2b

SQ2b: Does a relationship exist between the level of functionality in housekeeping, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

Linear regression was used to determine there was a relationship between housekeeping and total costs per Medicaid 1915(c) Aged Waiver recipient. The results of the correlation were not significant, as housekeeping could not be considered a strong predictor of overall costs, $r = .20$, $p < .005$ as seen in the Table 14 below:

Table 14

Linear Regression between Housekeeping and Cost per Medicaid 1915-C Recipient

Model	R	R^2	Adjusted R^2	SE	*p* value
Housekeeping	.205[a]	0.042	0.037	1.319	0.005

a. Predictors: (Constant), This field indicates the patient's current ability to prepare light meals, do laundry, and go shopping.

Research Subquestion 2c

SQ2c: Does a relationship exist between the level of functionality in the ability to administer medications, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah?

Linear regression was used to determine there was a relationship between housekeeping and total costs per Medicaid 1915(c) Aged Waiver recipient. The results of the correlation were not significant, as housekeeping could not be considered a strong predictor of overall costs, $r = .27$, $p < .005$ as seen in the Table 15 below:

Table 15

Linear Regression between Medication Management and Cost per Medicaid 1915-C Recipient

Model	R	R^2	Adjusted R^2	SE	*p* value
Medication Management	.27[a]	0.073	0.069	1.503	0.000

a. Predictors: (Constant), This field indicates the patient's ability to manage and administer medication.

Summary

Chapter 4 assed the Katz ADL and Lawton IADL independent variables of functionality in hyper-aging states using dressing, bathing, toileting, toileting hygiene, transferring, feeding, use of a telephone, shopping, and medication management on the total payments made by Medicaid on patients. These ten variables were examined with data collected by the CMS. The research questions and their respective sub-questions, their hypotheses, and ultimate deductive conclusions are discussed below:

The first research question had a null hypothesis that indicated ADL, as measured by the Katz ADL questionnaire, are not significant predictors of cost per Medicaid 1915(c) home- and community-based recipient in Alaska, Nevada, and Utah. The results of linear combination regression revealed a weak positive linear correlation between assessment items and cost per Medicaid 1915(c) home- and community-based recipient in Alaska, Nevada, and Utah; the null hypothesis could not be rejected and the alternative can be accepted.

The second research question had a null hypothesis that indicated IADL, as measured by the Lawton IADL questionnaire, are not significant predictors of cost per Medicaid 1915(c) home- and community-based recipient in Alaska, Nevada, and Utah. The results of linear combination regression revealed a weak positive linear relationship but $p>.005$. Therefore, the null hypothesis could not be rejected, and the alternative can be accepted.

The first research sub-question had a null hypothesis that indicated there is no relationship between the level of functionality in bathing, a subdomain of the ADL scale

as measured by the Katz bathing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah. Linear regression revealed a weak positive linear relationship but $p<.005$; the null hypothesis could be rejected and the alternative accepted.

The second research sub-question had a null hypotheses that indicated there is no relationship between the level of functionality in dressing, a subdomain of the ADL scale as measured by the Katz dressing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah. Linear regression revealed a weak positive linear correlation between dressing and cost per Medicaid 1915(c) home- and community-based recipient in Alaska, Nevada, and Utah but $p<.005$; the null hypothesis could be rejected and the alternative accepted.

The third research sub-question had a null hypotheses that indicated there is no relationship between the level of functionality in toileting, a subdomain of the ADL scale as measured by the Katz toileting subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah. Linear regression revealed a weak positive linear relationship but $p<.005$; the null hypothesis could be rejected and the alternative accepted.

The fourth research sub-question had a null hypothesis that indicated there is no relationship between the level of functionality in transferring, a subdomain of the ADL scale as measured by the Katz bathing subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah. Linear regression revealed a weak positive

linear relationship but $p<.005$; the null hypothesis could be rejected and the alternative accepted.

The fifth research sub-question had a null hypothesis that indicated there is no relationship between the level of functionality in continence, a subdomain of the ADL scale as measured by the Katz continence subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah. Linear regression revealed a weak positive linear relationship but $p<.005$. Therefore, the null hypothesis could be rejected and the alternative accepted.

The sixth research sub-question had a null hypothesis that indicated there is no relationship between feeding, a subdomain of the ADL scale as measured by the Katz continence subscale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah. Linear regression revealed a weak positive linear relationship but $p<.005$. Therefore, the null hypothesis could be rejected and the alternative accepted.

The seventh research sub-question had a null hypothesis that indicated there is no relationship between the level of functionality in the ability to use a telephone, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah. Linear regression revealed a weak positive linear relationship but $p<.005$. Therefore, the null hypothesis could be rejected and the alternative accepted.

The eighth research sub-question had a null hypothesis that indicated there is no relationship between the level of functionality in housekeeping, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in

Alaska, Nevada, and Utah. Linear regression revealed a weak positive linear relationship but $p<.005$. Therefore, the null hypothesis could be rejected and the alternative accepted.

The ninth research sub-question had a null hypothesis that indicated There is no relationship between the level of functionality in the ability to administer medications, a subscale of the IADL as measured by the Lawton scale, and cost per Medicaid 1915(c) aged waiver recipient in Alaska, Nevada, and Utah. Linear regression revealed a weak positive linear relationship but $p<.005$. Therefore, the null hypothesis could be rejected and the alternative accepted.

The next chapter will develop further the findings of the study analysis and discuss interpretations to the current theories found in the literature. It will also expound on some of the descriptive statistics of the sample population and offer detailed conclusions about the specifics of the analyses. Chapter 5 will also discuss the study recommendations and limitations as well as future implications for positive social change.

Chapter 5: Discussion, Conclusions, and Recommendations

Nature of the Problem

Massive healthcare reform has been witnessed since 2010 when the United States federal government took on the task of developing a foundation of universal care for the citizenry. The Patient Protection and Affordable Health Care Act (PPACA), also known as the "ACA" and "Obamacare," was officially implemented into law. One of the more pronounced aftereffects of the ACA was the large increase in enrollment of states into Medicaid programs, such as the 1915(c) Medicaid Home- and Community-based waiver program. States can tailor programs based on need, "This waiver enables states to tailor services to meet the needs of a particular target group. Within these target groups, states are also permitted to establish additional criteria to further target the population to be served on a HCBS waiver" (medicaid.gov, 2020). These programs allowed patients to stay at home or in their respective communities and receive care as an alternative to institutionalized care. The requirements of the program are to "demonstrate that providing waiver services won't cost more than providing these services in an institution, ensure the protection of people's health and welfare provide adequate and reasonable provider standards to meet the needs of the target population ensure that services follow an individualized and person-centered plan of care" (medicaid.gov, 2020). Despite this move in national health policy theory to healthcare being a right to all living human beings, there remained little emphasis on the most vulnerable population of those who are both aged and economically disadvantaged.

The over 65 years age group is still one of the most under researched groups, even though this age group is the fastest growing in the United States when compared to other age groups (AoA, 2018). Understanding of the hyper-aging population is critical in the United States as other industrialized countries focus on its expansion. However, there are certain functional characteristics of physiology involved in the process of aging that have not been explored or tested in states that have shown the highest percentage of 65 and over from 2000-2010. This gap in the literature has implications that are both national and global. Academics and clinicians' race to find solutions to fit the needs of this ever-expanding aging population and HCBSs offer a way to ease the demand placed on the traditional SNFs. Using the well-known Katz ADL and Lawton IADL scales provided a foundation for the assessment of functionality in hyper-aging states that met the qualifying criteria for Medicaid 1915(c) home- and community-based waiver programs. Most of the concerns raised in Chapter 2 highlighted a lack of strategies in the United States for efficiently developing and pursuing long-term elder care policy goals that emphasize the areas of most need in functional limitations. Most long-term care policy in the United States has documented the growing number of the population aged 65 and over, but because Japan is the only nation to reach a hyper-aged status, most of the emphasis in the literature has been on the national "2030 Problem" (Kudo et al., 2015) in the United States have only included descriptive statistics regarding the age group percentages.

This quantitative research was guided by a mix of theoretical frameworks that included the functional assessment questionnaires developed by Katz et al. (1963) and

Lawton and Brody (1969) to provide the best foundational lens for research of bathing, dressing, toileting, transferring, toileting hygiene, dressing, telephone use, household tasks, and medication management when applied to Alaska, Nevada, and Utah. Even with adjustments being made to the Lawton scale due to incomplete data fields in some of the patient files, reliability and validity of the two combined assessments demonstrated good internal validity when scaling using Cronbach's alpha, with a value of $\alpha = 0.85$. The dependent variable was selected based on a review of the literature, which found that cost was one of the most considered aspects of functionalism theory where social structures consist of individuals, organizations, and programs that meet social needs (Novak, 2018). The selected social structure for the study was the Medicaid 1915(c) Aged waiver program provided by states and funded by the federal government. Combining these theoretical elements and variables provided an exploratory platform for researching the most critical functional limitations of the over 65 years of age cohort, and the study was able to be conducted in states that were aging the fastest from 2000-2010, described as hyper-aging states in the study.

Chapter 2 identified a lack of modern research on states with hyper-aging populations, which also recognized a unique set of challenges to the health policy of the over 65 years of age cohort, even more pronounced in Medicaid 1915(c) recipients from the respective states selected for study. Absent from traditional functionality theory constructs such as the Katz ADL (1963) assessment and the Lawton IADL questionnaire (1969) was the concept of hyper-aging. Functional theory, ADL, and IADL assessments were common in traditional general populations being surveyed in home- and

community-based settings (Ashby & Beech, 2016; Feinstein et al., 1986; Kogan et al., 2016; Tyler & Fennell, 2015) but there was no emphasis on states that held higher recent percentages of the over 65 years of age cohort. Thus, costs in the fastest-aging states in the country were considered a focus of the dependent variable.

Katz ADL and Lawton IADL provided an excellent theoretical lens to examine the costs of these most vulnerable populations in America's hyper-aging states. Data from the CMS was collected in an exhaustive and time-consuming data request process encompassing over 1 and a half years to answer the two guiding research questions:

RQ1: What functionality levels found in ADL, if any, are most significant in Alaska, Nevada, and Utah when using the Katz ADL Scale to calculate predictions on cost per Medicaid 1915(c) recipient?

RQ2: What functionality levels in IADL, if any, are most significant in Alaska, Nevada, and Utah when using the Lawton IADL Scale to calculate overall significance on cost per Medicaid 1915(c) recipient?

Test results of functionalism theory, Katz ADL, and Lawton IADL validated a significant effect that functionality in Medicaid 1915(c) Aged waiver recipients have on total costs found in hyper-aging populations. The next section provides a critical analysis of the limitations of this study, suggestions for future research, and the value of functionalism theory to costs in hyper-aging populations. Lastly, I discuss social change implications.

Interpretation of the Findings

The dependent variable for this study included cost per Medicaid 1915(c) recipient in Alaska, Nevada, and Utah. Independent variables were items from the Katz

ADL and Lawton IADL that were modified to fit the data: bathing, dressing, toileting, transferring, toileting hygiene, dressing, telephone use, household tasks, and medication management. Control variables for the study were age, gender, race, and ethnicity. To examine Katz ADL and Lawton IADL, I developed two research questions and nine subquestions as well as corresponding hypotheses. I requested data from the CMS for the 2012 MAX PS file summary of 563 patients from Alaska, Nevada, and Utah. The OASIS home health assessment data included all 260,806 from the Medicaid 1915(c) recipients from across the country, and the patient beneficiary identification codes had to be cross-reference from the two data sets by hand. There were 296 patients who were excluded from the representative sample who had incomplete data reported for most of the independent variables. While the study did not allow for a qualitative research design, this quantitative research design allowed for a national review of programmatic function in the analyses of 267 patients by collecting data from established sources with proven reliable and valid methods. The data did contain some misnomers that ranged from not including one or more items in the assessment to incomplete data fields for all requested research items. Using a randomized sequencing pattern in Microsoft Excel, these patients were removed and replaced with patients who reported numeric data in fields that contained most of the variables. Overall, the large amounts of incomplete data reported by professional home health agencies compared with the total cost of the data paid by me was discouraging and was suggestive of the need for further analysis into the reporting practices of the HHAs when completing the OASIS data survey.

Three age groups were included in the data sets provided by the CMS, consisting of Young-Old 65-74, Middle-Old 75-84, and Oldest-Old 85 plus. I made calculations based on the last age that the patient reported data, as some patients may have passed away and the current date the analysis took place could not be used. The largest percentage reported in the representative sample from each state was 43.8% from the Middle-Old age group 75-84, with 42.6% aged 65-74 in the Young-Old cohort, and 13.5% aged 85 and over from the Oldest-Old. This confirmed data from the U.S. Census Bureau from 2000-2010 that showed the Young-Old aged 65-74 represented 53.9%, the 75-84 Middle-Old cohort denoted 35.3%, and the 85 plus Oldest-Old group was 12.2% of the total population.

Descriptive statistics from the analyzed representative sample of Alaska, Nevada, and Utah revealed age group 65 to 74 accounted for 10.6% of the sample in Alaska, with 14.9% found in Nevada, 13.1% was found in Utah. This mean of the range of the 65-74 age group was 38.6% which was very similar to the national averages reported by the U.S. Census Bureau in 2010. The 75 to 84 age group from the representative sample of 267 patients contained 14.9% from Alaska, 11.9% was from Nevada, and there were 14.9%. In the representative sample of patients, the total percentage of the 75 to 84 age group was 43.8%. The 85 plus age group, identified as the Oldest-Old cohort, accounted for 13.5% of the total population aged 65 and over, whereas national data in the 2010 U.S. Census bureau indicated the Oldest-Old cohort accounted for 13.7% of the general population aged 65 and over. Alaska reported 3.8%, Nevada reported 4.4%, and Utah reported 5.2%. The narrow gaps identified between each age group in the representative

sample and the general population U.S. Census data helped to build a strong case for generalizability of the descriptive statistics and study results.

Costs of Care in Hyper-Aging Populations

In 2027, national health spending will account for almost 20% of the gross domestic product in the United States with 5.5% being spent by Medicaid (CMS, 2015). Total overall costs incurred by patients, private insurance, and social insurance has increased throughout each sector of the healthcare industry in the last few decades in the general population. Older adults in the over 65 years of age range present more complex financial obstacles when using social insurance in long-term care settings, such as home- and community-based care.

An increasing emphasis was placed on the long-term care of elder populations and the costs of social insurance programs around the late 1980s (Gilford, 1988). It was imperative for this study that I select states with the fastest aging populations by percentage from 2000-2010 that also had a qualifying Medicaid 1915(c) HCBS program. Programmatic growth, total spending, and total costs have increased rapidly in noninstitutionalized care settings. The demand for research has shifted to evidence-based research in home- and community-based care as opposed to traditional skilled nursing facilities (Jayadevappa, 2017; Wickson-Griffiths et al., 2016).

To understand the costs on average, hyper-aging states with a qualifying Medicaid program were identified to show differentiation in costs found in Alaska, Nevada, and Utah. By using the subpopulation from each state, the rule of three in statistics could affirm any assertions made within the hypotheses. Analysis of the average total payments

made from related services provided by program 1915(c) in Alaska were $30,053 in 2012. Nevada had an average total of payments in the amount of $2,678 in 2012. Utah had an average total payment for related services in 2012 of $8,541 per Medicaid 1915(c) recipient. Analysis of means (ANOM) revealed that the total average of payments between the three reported states was $13,758. Factors explaining the average total payments made by Medicaid on qualifying 1915(c) HCBS were wide-ranging and different within each state.

Macroeconomic factors such as, average cost of living, income levels, price levels and other economic factors influenced the dependent variable of total payments made. States are also allowed to expand and contract programmatic spending on HCBS based on many economic and political factors outside the breadth of this research study. The medical training and specialties of the providers who assisted in completing the surveys also varied. The disciplines of person completing the assessment included registered nurse (RN), physical therapist (PT), speech language pathologist/speech therapist (SLP/ST), and occupational therapist (OT). Assistants, aides, and preceptors may not be responsible for completing OASIS. Providers completing the comprehensive assessment at the start of care (SOC) may include input from the patient, caregivers, physicians, pharmacists, and/or any other health care agency staff.

Activities of Daily Living

The focus in most of the findings reported in the research throughout the body of literature discussed the significance of ADL and IADL in populations and its effect on overall costs related to a representative sample from. (Kunnen & Bosma, 2000; Kunnen,

2012; Meiners et al., 2014; Steenbeek & Van Geert, 2008; Van Geert, 1991; Van Geert, 1994). The Katz (ADL) and Lawton (IADL) scale provided a consistently reliable and valid assessment model throughout the body of the literature but there was little information that could corroborate findings in multiple states, and those with the fastest aging populations, within one research study. Each state presented with differing conclusions, but ADL remained as one of the most reliable an valid assessments of functionality within populations aged 65 and older that were tested (Gurland & Maurer, 2012) in the literature from its inception in 1950s until recent times.

Research Question 1 was assessed through a multiple linear regression analysis. The findings ($r = .33$, $p < .005$), demonstrated that the Katz Activities of Daily Living (ADL) had positive correlation with total payments made by Medicaid for each recipient. Additionally, items found within the ADL assessment tool were research sub-questions 1 through 6. These functional indicators were assessed using linear regression and the results are below in Table 16:

Table 16

Regression Analysis of Katz Activities of Daily Living and Cost per Medicaid 1915(c) Aged Waiver Recipient

Model	R	R^2	Adjusted R^2	SE
Katz ADL	.328	0.101	0.077	1.47
Bathing	.254	0.064	0.061	1.459
Dressing	.217	0.047	0.044	1.147
Toileting	.209	0.044	0.04	1.475
Transferring	.201	0.04	0.036	1.54
Toileting Hygiene	.194	0.038	0.034	1.449
Feeding	.275	0.076	0.072	1.483

Means of the ADL reported for each patient varied by state. The average score for bathing in Alaska, Nevada, and Utah was 3.37 out of 6. The Medicaid OASIS HHA indicates that with a score of three on the bathing assessment, a patient is," able to participate in bathing self in shower tub but requires presence of another person throughout the bath for assistance or supervision. The findings reaffirmed the importance of bathing as functional assessment item in the Katz ADL scale found within the literature (Katz et. Al, 1970). Findings from data reported by Alaska on bathing as a functional indicator within the home- and community –based population, had an average of 4. A score of four on the Medicaid OASIS HHA revealed that a patient was, "unable to use the shower or tub, but able to bathe independently with or without the use of devices at the sink, in a chair, or on the commode. Utah reported an average of 3 on the bathing assessment item, whereas Nevada reported an average of 3.13 on the assessment item. Patients in the Alaska Medicaid 1915(c) program were less independent when assessing

the current ability to wash their entire body safely. Patients in Nevada and Utah were reported as more independent in the assessment item.

Mean (μ) of the assessment item dressing found in the total sample $n = 267$ of the hyper-aging states from recipients of Medicaid 1915(c) HCBS recipients was 2.01. Scores in this range indicate that a patient must have someone assists with putting on clothes and getting dressed. μ of the ADL assessment item dressing found in the Alaskan sample $\overline{x} = 89$ of the recipients of Medicaid 1915(c) HCBS recipients was 2.33. μ of the ADL assessment item dressing found in the Nevada sample $\overline{x} = 89$ of the recipients of Medicaid 1915(c) HCBS recipients was 1.89, whereas μ of the Utah sample $\overline{x} = 89$ of the recipients of Medicaid 1915(c) HCBS recipients was 1.93. Recipients in Alaska were reported by providers as having less independence in dressing, putting on their clothes, and removing their clothing items. Patients in Nevada and Utah were reported by providers as having more independence.

Mean (μ) of the assessment item toileting found in the total sample $n = 267$ of the hyper-aging states from recipients of Medicaid 1915(c) HCBS recipients was 1.46. A score of 1 indicates that when reminded, assisted, or supervised by another person, the patient was able to get to and from the toilet. Scores of 2 indicate a patient is unable to get to and from the toilet but can use a bedside commode (with or without assistance). μ of the ADL assessment item toileting found in the Alaskan sample $\overline{x} = 89$ of the recipients of Medicaid 1915(c) HCBS recipients was 1.90. μ of the ADL assessment item toileting found in the Nevada sample $\overline{x} = 89$ of the recipients of Medicaid 1915(c) HCBS recipients was 1.28, whereas μ of the Utah sample $\overline{x} = 89$ of the recipients of Medicaid

1915(c) HCBS recipients was 1.20. Recipients in Alaska were reported by providers as having less independence in toileting. Patients in Nevada and Utah were reported by providers as having more independence.

Mean (μ) of the assessment item transferring found in the total sample *n* = 267 of the hyper-aging states from recipients of Medicaid 1915(c) HCBS recipients was 1.68. Patients able to transfer with minimal assistance or with the use of an assistive device received a score of 1. Patients who scored a 2 were able to bear weight and pivot during transfer but unable to transfer self. μ of the ADL assessment item transferring found in the Alaskan sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 2.16. μ of the ADL assessment item toileting found in the Nevada sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 1.49, whereas μ of the Utah sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 1.39. Recipients in Alaska were reported by providers as having less independence in transferring. Patients in Nevada and Utah were reported by providers as having more independence.

Mean (μ) of the assessment item transferring found in the total sample *n* = 267 of the hyper-aging states from recipients of Medicaid 1915(c) HCBS recipients was 1.76. Scores in this range indicated that patients must have someone help the patient to maintain toileting hygiene and/or adjust clothing. μ of the ADL assessment item of toileting hygiene found in the Alaskan sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 2.11. μ of the ADL assessment item toileting found in the Nevada sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 1.56, whereas μ of the Utah sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS

recipients was 1.64. Recipients in Alaska were reported by providers as having less independence in transferring. Patients in Nevada and Utah were reported by providers as having more independence.

Mean (μ) of the assessment item feeding found in the total sample *n* = 267 of the hyper-aging states from recipients of Medicaid 1915(c) HCBS recipients was 0.88. Scores in this range indicated that patients are able to feed self independently but requires: (a) meal prepared by another or (b) intermittent assistance or supervision from another, or (c) a liquid, pureed or ground beef diet. μ of the ADL assessment item of feeding found in the Alaskan sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 1.18. μ of the ADL assessment item feeding found in the Nevada sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 0.79, whereas μ of the Utah sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 0.66. Recipients in Alaska were reported by providers as having less independence in transferring. Patients in Nevada and Utah were reported by providers as having more independence.

Instrumental Activities of Daily Living

The Lawton and Brody scale (Lawton & Brody, 1969) was created after the Katz Scale (1963) and has been found to be as reliable, valid, and effective in assessing functional ability and costs in older populations. Most of the findings in the literature indicated that the Lawton Scale (1969) was able to detect problems in functional ability from a very early onset and its importance in recent findings emphasizes the reproductive use in older cohorts (Naylor et al., 2016). Traditional research indicated the scale was

successful in assessing home- and community –based Medicaid populations but there was little research that applied the scale to hyper-aging populations in states that had the highest percentage of the over 65 years crowd. The common use of the Lawton IADL Scale (1969) in the long-term care literature, its proven reliability and validity, as well as the growing use in assessing Medicaid cohorts prompted the choice for the scale to be attached to the Katz (1963) Scale in an attempt to focus on most reliable indicators in hyper-aging cohorts.

Research Question 2 was assessed through a multiple linear regression analysis. The findings ($r = .31$, $p < .005$), demonstrated that the Lawton and Brody Instrumental Activities of Daily Living Scale (1969) had positive correlation with total payments made by Medicaid for each recipient. Additionally, items found within the ADL assessment tool were research sub-questions 7 through 9. These functional indicators were assessed using linear regression and the results are below in Table 17:

Table 17

Regression Analysis of Lawton Instrumental Activities of Daily Living and Cost per Medicaid 1915(c) Aged Waiver Recipient

	R	R^2	Adjusted R^2	SE	P Value
Lawton IADL	.312[a]	0.098	0.082	1.352	0.001
Telephone Use	.221[a]	0.049	0.044	1.319	0.001
Housekeeping	.205[a]	0.042	0.037	1.319	0.005
Medication Management	.27[a]	0.073	0.069	1.503	0.000

Mean (μ) of the assessment item telephone use found in the total sample *n* = 267 of the hyper-aging states from recipients of Medicaid 1915(c) HCBS recipients was 1.47. Scores in this range indicated that patients were able to use a specially adapted telephone and call essential numbers. μ of the instrumental ADL assessment item of telephone use found in the Alaskan sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 2.14. μ of the ADL assessment item feeding found in the Nevada sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 1.32, whereas μ of the Utah sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 0.95. Recipients in Alaska were reported by providers as having less ability to make and receive phone calls. Patients in Nevada and Utah were reported by providers as having more independence.

Mean (μ) of the assessment item household tasks found in the total sample *n* = 267 of the hyper-aging states from recipients of Medicaid 1915(c) HCBS recipients was 1.5. Scores of one indicated a patient was dependent on another for household tasks of laundry, meal preparation, and shopping. Scores of two indicated a patient needed some assistance when completing the household tasks of laundry, meal preparation, and shopping. μ of the instrumental ADL assessment item of telephone use found in the Alaskan sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 1.7. μ of the ADL assessment item feeding found in the Nevada sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 1.4, whereas μ of the Utah sample $\overline{x}$ = 89 of the recipients of Medicaid 1915(c) HCBS recipients was 1.4. Recipients in Alaska were reported by providers as having less independence in their household chores. Patients in

Nevada and Utah were reported by providers as having more independence but still requiring assistance.

Mean (μ) of the assessment item medication management found in the total sample $n = 267$ of the hyper-aging states from recipients of Medicaid 1915(c) HCBS recipients was 2.00. Scores in this range indicated that patients were able to take medications at the correct time if given reminders by another person at the appropriate time. Scores of three indicated a patient was unable to take medication unless administered by another person. μ of the IADL assessment item of telephone use found in the Alaskan sample $\overline{x} = 89$ of the recipients of Medicaid 1915(c) HCBS recipients was 2.14. μ of the ADL assessment item feeding found in the Nevada sample $\overline{x} = 89$ of the recipients of Medicaid 1915(c) HCBS recipients was 1.32, whereas μ of the Utah sample $\overline{x} = 89$ of the recipients of Medicaid 1915(c) HCBS recipients was 0.95. Recipients in Alaska were reported by providers as having less ability to make and receive phone calls. Patients in Nevada and Utah were reported by providers as having more independence.

Limitations of the Study

Participants in this study were drawn from two different data bases packaged and sent by the CMS and included recipients of Medicaid 1915(c) waiver programs in Alaska, Nevada, and Utah. The dependent variable of total beneficiary cost was drawn from the MAX patient files. These patient beneficiary IDs were then cross referenced with OASIS Home Health Assessment (HHA) data that reported the predictor variables of ADL and IADL in patients. The de-identified patient data had to be requested, approved by committee, and the total cost to me was $6,400 and took over a year and half to be

completed. Several limitations were noted throughout and in the conclusion of this study. The focus on HCBS waiver patients limited the findings to generalizability in other care long-term care settings with patients that qualified for Medicaid 1915(c) HCBS programs. The design of the study was correlational with regression analysis to study significance of the predictor variables (ADL and IADL) on costs of care paid by Medicaid (dependent variable). Finally, each assessment as a whole and separate predictor variable demonstrated significance in costs of care per Medicaid recipient. While the correlation in relationships were positive, there was no evidence indicating a single strong predictor in all of variables that were test and the study is limited in the ability to identify specific strategies to (a) improve ADL outcomes or IADL outcomes, or (b) identify variables that lead to lower costs.

The review of literature found little emphasis on descriptive statistics and costs in states with hyper-aging populations utilizing Medicaid 1915(c) HCBSs but there were studies that had tested ADL and IADL scales in similar state populations (Katz, 1963 & Lawton, 1969). Descriptive statistics in similar national research (Konetzka, Potter, & Karon, 2012) found that females were most recipients of HCBS Aged Waivers in state gender subpopulations. Alaska reported 69.08% female, Nevada reported 75.58% female, and Utah reported 74.28% female. However, findings in this study revealed that gender mean analysis was 82.6% female when compared to 17.4% male. Age group representation was 42.6% of the young old, aged 65-74. Ages 75-84, referred to as the Middle-Old in the literature, represented 43.6%, whereas the Oldest-Old aged 85 and over contained 13.8% of the total representative sample. Race and ethnicity were

analyzed state-by-state and descriptive statistics revealed similar results of the total averages reported in the general population. There were 74.8% Medicaid 1915(c) recipients who had a race and or ethnicity that was reported as white. Since most recipients were reported by providers as being female, white, and around the age of 65-84, results may not be reproducible in other representative samples that have largely different explanatory demographic statistics.

Recommendations for Action

The principle objectives of this study were to examine how ADL and IADL could explain the impact of variations on costs per Medicaid 1915(c) recipient in states with hyper-aging populations. Variations in the total payments made by Medicaid 1915(c) for home- and community- based services in hyper-aging states quickly became the emphasis of the study. Data collected from the CMS was used to test the Katz ADL Scale (1963) and the Lawton IADL Scale (1969) as a basis for explaining costs in hyper-aging state populations. These frameworks offered a model for functional assessment. These scales have been used in HCBS populations and positive correlations in specific age cohorts that include the Young-Old, Old-Old, and Oldest-Old were discovered (Martin et el., 2015). After a national review of Census data, Medicaid recipients from this study came from Alaska, Nevada, and Utah because they had a qualifying 1915(c) program. Countries such as Japan, have already reached a hyper-aged state with one in five people aged 65 and older. Global concerns over the increasing over 65 years cohort continue to rise as the frail elderly population become a larger percentage of the general public and research in the United States is on the rise (Pruchno, 2015). However, there is little evidence of

research on states containing the highest percentage of growth in the over 65 years age cohort in the general public.

The most important finding of the study to gerontology is that, as explained above, there is no single ADL or IADL predictor variable that can demonstrate strong statistical significance when assessing for total Medicaid 1915(c) HCBS payments made, or costs per patient. Variations in the significance of the predictor variables in hyper-aging states of Alaska, Nevada, and Utah could be accounted for by the nature of the federal government giving states the ability to develop and implement Medicaid 1915(c). Different levels of medical training of providers and their understanding of functional medicine and the Katz ADL (1963) scale as well as the Lawton (1969) scale could possibly explain some of the variations in the average scores reported by each state. Results deliver modern empirical data to gerontologists, healthcare administrators, and researchers. The findings are relevant to those researchers and practitioners seeking to understand the functional ability of the fastest aging states with Medicaid 1915(c) home- and community-based programs and the effects of ADL and IADL reporting on the independent variable of overall programmatic costs of each patient.

Long-term care administrators can benefit from understanding the role of functional indicators, such as ADL and IADL in hyper-aging states and the effect on costs to improve and modify spending in functional areas that are significant. Additionally, further research that includes specific focus on mediating and control variables (previous occupation, hours worked weekly, level of education attained, average level of adult income, geographic origin, and number of years married, if any)

will provide additional insight on total average payments made for recipients of similar home- and community –based programs. Long-term care administrators and clinicians could develop training programs and public policy to improve overall quality of life for patients in home- and community-based setting as well as improve treatment and care plans for healthcare providers when assessing and treating functional limitations.

Results can be beneficial to administrators at each setting on the long-term care continuum and not just HCBS. While the study findings are the result of assessment in recipients of Medicaid 1915(c) waivers in the hyper-aging populations of Alaska, Nevada, and Utah, it is feasible for other organizations, such as skilled nursing facilities (SNFs), to conduct an assessment using a representative sample from similar states or communities with hyper-aging populations. Results from the current study are beneficial to multiple faucets of the elder care community because the studied population contains a representative sample from states that saw the largest percentage of age 65 and over population increase from 2000-2010. Federal and state data from representative samples found in populations who are seeing the largest percentage increases in aging populations is imperative for the United States to understand the functional characteristics of the future hyper-aged population which we will achieve by 2030.

Population trend statistics revealed that a majority of Medicaid 1915(c) recipients in the total representative sample fell within the Middle-Old cohort. These findings are consistent when comparing the general population cohorts between the ages of 65-84 found in the United States Censuses Bureau from 2000-2010. Currently, the trend is a large growth in the Young-Old and Middle-Old cohorts, and the AoA (2018) reported

that the general population in the United States is on course to reach a 20% rate of aged 65 and older by the year 2030. The demographic results of the study enable administrators, policymakers, and researchers to understand the fastest aging parts of society, educate the general public, and raise awareness.

There was a large amount of empirical evidence that indicated states are rapidly expanding Medicaid 1915(c) programs and programmatic growth as well as taxpayer expenditures also continue to rise, and the U.S. general public becomes a hyper-aged nation by the year 2030. Kuhlmann et al. (2015) and Segelman et al. (2017) noted that costs in these programs have seen a remarkable rise since states were given the authority by the federal government to expand programs under the Patient Protection and Affordable Care Act of 2010. This was later defined by the federal courts to be expanded at the discretion of state governors and this grew exponentially as programs began to utilize the new standards (Gusmano, 2015). Increased understanding of total payments made by Medicaid 1915(c) programs and spending vis-à-vis cost trend variations by state in the findings indicates the need for further analysis of cost reporting measures at the state level. The findings indicate, at the state level, a foundation for what future research of ADL and IADL indicators and costs could mean for researchers at the national level as the population moves toward a hyper-aged nation by 2030.

Recommendations for Further Study

While the current findings of this study demonstrate there a positive correlation between the relationship of ADL and IADL on costs per Medicaid 1915(c) recipient in hyper-aging states, further research is necessary as the understanding of HCBSs at the

national level is insufficient and it becomes imperative in the next decade. The current study was a linear regression analyses that tested the reported functionality of Medicaid 1915(c) recipients using ADL and IADL as predictor variables in assessing overall costs, defined as total programmatic payments made per recipient, in hyper-aging states. Further research may advance understanding of programmatic costs by employing similar studies at state, regional, and national level to emphasis variances over a longer period and utilize additional control variables and mediating variables.

With population projections trending toward a hyper-aged United States by 2030, there is a growing reliance on Medicaid programs, such as HCBS to meet the demand. Increased stresses on the healthcare system by aging populations and the growth of healthcare federalism by renewed cooperation between the federal government and the states (Gusmano, 2015), also necessitate researchers study trends in hyper-aging populations. While ADL and IADL predictor variables showed significance on overall costs in HCBS settings, additional research is needed to understand the implications in other long-term care environments. Administrators, clinicians, and researchers working in long-term care environments will need to be adept in explaining how Medicaid dollars are being spent and demonstrate quantifiable significance in their programmatic costs as competition will become greater with the ebb and flow of state budgets as the pool of working age taxpayers continues to have an inverse relationship with elderly patients in need of health care in home- and community- based settings.

The future of aging populations depends on our current findings in the field as the long-term care continuum shifts toward and a home- and community-based model of

care. The need for further study is intensified by the nature of the problem as one that affects not only the patient in need of quality of care but also the immediate family, the community in which a patient resides, and the long-term care industry. Further research is required to fully understand the problem as one that is important to both the individual and society (Wan & Antonucci, 2016). Researchers interested in understanding and potentially quelling the costs of Medicaid 1915(c) programs can study costs in hyper-aging populations and potentially enable access to quality care for a larger number of patients as society in the United States continues its aging course.

Implications for Positive Social Change

In 2010, Congress and the Obama Administration passed comprehensive healthcare legislation HR 35990 and the Patient Protection and Affordable Care Act was created. There were many challenges to the care delivery system in the United States and unique obstacles were presented to the 65 and over age cohorts in this unknown healthcare frontier. Subsequently, home- and community –based programs such as Medicaid 1915(c) saw greater utilization as states began to expand programs and greater access to care became an understood right for patients in underserved populations with little or no socioeconomic status (Wiener, Segelman, & White, 2020). States were given the authority of offering a community first option to provide attendant care services and supports, amend the current state plan to include a HCBS benefit, and restructure spending for long term services and supports (LTSS) so that community-based options were equally represented (Mason et al., 2015; Yip, 2017). The shift in consumer preference to home care and community options over the last two decades, the passage of

the PPACA, and the lack of study of HCBS in states with the fastest-aging populations have denoted a policy problem.

There should be increased emphasis on universal benchmarks when assessing program effectiveness by using tools such as the Katz ADL Scale (1963) and Lawton IADL Scale (1969) to measure the overall functional health of a population and its predictability of costs. A proposal to immediately impact positive social change would be implementing an assessment tool that calculates variances in costs by state, so that administrators and policymakers can understand why costs may be higher comparatively. Armed with more knowledge about fluctuations in the costs of care, federal and state governments can recommend to home- and community care organizations revised standards based on recent literature that can be assessed for improvement in quality patient care, costs of care, and overall programmatic costs using taxpayer dollars. The current study highlights the need for additional explanations in cost and reported ADL and IADL variances at the state and federal level and this proves to be invaluable as society continues to age and states continue to expand access to Medicaid 1915(c) programs and increase spending.

ADL and IADL can be linked to cost variations in Medicaid 1915(c) recipient costs payments in hyper-aging populations. The literature confirmed that studying the impact of ADL in IADL in aging populations could explain current patient limitations, identify possible courses of treatment to curtail patient limitations and improve function, predict patient outcomes, and ultimately improve spending efforts and expand access to care (Mount, Lara, Schols, & Mathers, 2016). The findings demonstrated that

significance can be described by using explanatory statistics to quantify functional assessment items that have the most effect on costs in these vulnerable populations but it also highlighted the need for additional research to assess items in cohorts that were outside the demographic statistic majorities reported in the representative sample of recipients from Alaska, Nevada, and Utah. The findings have impacted positive social change by building a framework for future assessment in minority groups that represent some of the most vulnerable and underserved patients in United States home- and community-based care. Further research in similar aging populations is invaluable in shaping policy as the United States and global age 65 plus cohorts grow while growth in other age cohorts stall.

The broader perspective of the aging dilemma is a concern of not only United States public policy and administration, but a global policy quandary and demonstrates how valuable the results of the current study are in the public administration process of planning, organizing, directing, coordinating, and controlling of government resources (Carrigan et al., 2020). Understanding Medicaid 1915 (c) as a valuable government social insurance resource in the protection of vulnerable populations gives scholar-practitioners, healthcare providers, and researchers insight into the future of planning how costs behave when certain ADL and IADL predictor variables are reported in states with the largest percentage of age 65 years and over cohort. Another recommendation for organization is to address the shortage of universal quality standards that was created by the vacuum of the ACA passage along with states beginning to ramp up growth and spending in Medicaid 1915(c) programs. This gap in the literature and highlighted in the findings can

direct future quality measures that are aimed at understanding and mitigating costs, coordinate improved recipient outcomes, greater access to care by reforming applicant eligibility for the program. The findings allow all generations to understand the importance of the 2030 hyper-aged state and its role in society as not only a policy phenomenon and dilemma but a positive element for social change. Finally, the implications for positive social change include increased control of quality care delivered to a larger number of underprivileged recipients and potential applicants in the 1915(c) Medicaid program, improve continuity of care, promote policies that are cost conscious, and ultimate improve case outcomes via improved morbidity and mortality rates.

Conclusion

This rationale of this correlational research was to examine the associations between the predictor variables of ADL, IADL, and total Medicaid payments made to Medicaid 1915(c) recipients in states that had the fastest aging population in the United States between 2000-2010. This research enabled fresh perspectives on cost variations in hyper-aging populations found in the United States as well as patient functional abilities and limitations as reported by providers. Additional research is needed to further the Katz ADL theory (1963) and Lawton IADL (1969) theories and to compare the findings of those aging populations with the findings of studies in hyper-aging populations, such as this study, to understand what limitations are most prevalent in patients seeking treatment and most costly to society using social programs, such as Medicaid 1915(c).

The Katz ADL (1963) and Lawton IADL (1969) model provided the theoretical framework to assess the relationship of functional ability in Medicaid 1915(c) recipients

found in hyper-aging populations with overall average programmatic cost per recipient in the states of Alaska, Nevada, and Utah. The findings are beneficial to administrators, clinicians, policymakers, and researchers as the literature review suggested these theories have never been tested specifically in hyper-aging populations, until this study. Through the understanding of ADL and IADL on costs in our nation's fastest aging populations, known as hyper-aging states in the global literature, home- and community- based care professionals can effect social change in these unique environments and impact the efficacy of care delivered.

This increased understanding can promote social change by improving patient care, continuity of care, morbidity and mortality rates, and numerous other patient outcomes at the individual level. Further, additional populations can be assessed to advance understanding of the theories in the most vulnerable demographic groups such as age, race/ethnicity, and socioeconomic background, using the same theoretical applications applied in the current study, so that every group can be represented equally in the literature in the future, just as they should be in the United States. Concluding analysis revealed the findings, using traditional theoretical theory, can advance the understanding of programmatic costs at the community and societal levels in hyper-aging states by using a similar theoretical application in the future, as we move toward a hyper-aged nation in 2030.

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Appendix A: Katz Activities of Daily Living Scale

Katz Index of Independence in Activities of Daily Living		
Activities Points (1 or 0)	**Independence** (1 Point) **NO** supervision, direction or personal assistance.	**Dependence** (0 Points) **WITH** supervision, direction, personal assistance or total care.
BATHING Points: _____	**(1 POINT)** Bathes self completely or needs help in bathing only a single part of the body such as the back, genital area or disabled extremity.	**(0 POINTS)** Need help with bathing more than one part of the body, getting in or out of the tub or shower. Requires total bathing
DRESSING Points: _____	**(1 POINT)** Get clothes from closets and drawers and puts on clothes and outer garments complete with fasteners. May have help tying shoes.	**(0 POINTS)** Needs help with dressing self or needs to be completely dressed.
TOILETING Points: _____	**(1 POINT)** Goes to toilet, gets on and off, arranges clothes, cleans genital area without help.	**(0 POINTS)** Needs help transferring to the toilet, cleaning self or uses bedpan or commode.
TRANSFERRING Points: _____	**(1 POINT)** Moves in and out of bed or chair unassisted. Mechanical transfer aids are acceptable	**(0 POINTS)** Needs help in moving from bed to chair or requires a complete transfer.
CONTINENCE Points: _____	**(1 POINT)** Exercises complete self control over urination and defecation.	**(0 POINTS)** Is partially or totally incontinent of bowel or bladder
FEEDING Points: _____	**(1 POINT)** Gets food from plate into mouth without help. Preparation of food may be done by another person.	**(0 POINTS)** Needs partial or total help with feeding or requires parenteral feeding.
TOTAL: ____ SCORING: 6 = High (*patient independent*) 0 = Low (*patient very dependent*		

Note. Adapted from Wallace, M., & Shelkey, M. (2007). Katz Index of Independence in Activities of Daily Living (ADL). Try this: Best practices in in nursing care to older adults, Retrieved from Hartford Institute for Geriatric Nursing, New York University, College of Nursing.

Appendix B: The Lawton Instrumental in Activities of Daily Living Scale

Katz Index of Independence in Activities of Daily Living		
Activities Points (1 or 0)	**Independence** (1 Point) **NO** supervision, direction or personal assistance.	**Dependence** (0 Points) **WITH** supervision, direction, personal assistance or total care.
BATHING Points: _____	**(1 POINT)** Bathes self completely or needs help in bathing only a single part of the body such as the back, genital area or disabled extremity.	**(0 POINTS)** Need help with bathing more than one part of the body, getting in or out of the tub or shower. Requires total bathing
DRESSING Points: _____	**(1 POINT)** Get clothes from closets and drawers and puts on clothes and outer garments complete with fasteners. May have help tying shoes.	**(0 POINTS)** Needs help with dressing self or needs to be completely dressed.
TOILETING Points: _____	**(1 POINT)** Goes to toilet, gets on and off, arranges clothes, cleans genital area without help.	**(0 POINTS)** Needs help transferring to the toilet, cleaning self or uses bedpan or commode.
TRANSFERRING Points: _____	**(1 POINT)** Moves in and out of bed or chair unassisted. Mechanical transfer aids are acceptable	**(0 POINTS)** Needs help in moving from bed to chair or requires a complete transfer.
CONTINENCE Points: _____	**(1 POINT)** Exercises complete self control over urination and defecation.	**(0 POINTS)** Is partially or totally incontinent of bowel or bladder
FEEDING Points: _____	**(1 POINT)** Gets food from plate into mouth without help. Preparation of food may be done by another person.	**(0 POINTS)** Needs partial or total help with feeding or requires parenteral feeding.
TOTAL: ____ SCORING: 6 = High (*patient independent*) 0 = Low (*patient very dependent)*		

Note. Adapted from Graf, C. (2013). The lawton instrumental activities of daily living (IADL) scale. best practices in nursing care to older adults general assessment series. *The Hartford Institute for Geriatric Nursing, New York University, College of Nursing*.