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Neighborhood Factors, Cardiovascular Illness, Mental Health, and Aging in the United States

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This is to certify that the doctoral study by

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Walden University
2022

Abstract

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MPH, Walden University, 2017

MSc, Touro College, 2012

BSHS, Touro College, 2009

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

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Abstract

The inability to age in place among people 65 years old and older is a public health problem in the United States. However, it is unknown what neighborhood factors (i.e., trust, safety, shared values) impact the communities that are struggling to support individuals looking to stay in their homes as they age. The purpose of this quantitative correlational study was to examine the relationship between neighborhood factors (i.e., trust, safety, and shared values), cardiovascular illness (i.e., heart attack and stroke), mental health (i.e., depression), and aging in place, controlling for sex, age, marital status, educational level, employment status, and race. In this secondary data analysis guided by the socio-ecological model, the difference between sociodemographic variables and their impact on aging in place were explored. The study sample of 4,500 people was analyzed by binomial logistic regression. Results of the study show that sex ($p = 0.021$), age ($p = <.001$), marital status ($p = 0.023$), and educational level ($p = 0.016$) were all predictive of aging in place. However, logistic regression analysis indicated no statistical significance for trust ($p = 0.370$), safety ($p = 0.386$), shared values ($p = 0.772$), heart attack ($p = 0.712$), stroke ($p = 0.218$), and depression ($p = 0.479$). Age, sex, marital status, and educational level were the only significant associations with aging in place, but the findings were not significant between neighborhood factors, cardiovascular chronic illness, or mental health and aging in place. Recommendations include specialized training for public health professionals in socioeconomic factors that help people 65 and older age in place. The implication for social change is the prevention of institutionalization so that people 65 and older can chose where and how they live.

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Dedication

To my Husband, Dr. Donald Billings; my son, Ryan Billings; daughter-in-law, Selena Billings; granddaughter, Wrenix Billings; my mother, Frances Rivera; my father, Oseas Rivera; father-in-law, James Shelton; and my siblings, Henry Rivera Sr., Francine Menjivar, Deborah Espinoza, Chris Shelton, Camron Shelton; Cody Crawford, Deena, and G Weber; and my best friend, Tamura King, who have all influenced me to pursue my education. I love you all more than words can express.

Acknowledgments

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Section 1: Foundation of the Study and Literature Review

Introduction

Aging in place has become popular among those who are 65 years old and older so that they can avoid institutionalization and choose where and how they live (Rosenwohl-Mack et al., 2020). Aging in place is defined as the goal to live in one home for as long as possible and avoid the potentially isolating effects of living in a facility (Graham, 2018). In 2016, the U.S. Census indicated that people 65 and older were about 15% of the population, and by 2050, that demographic will increase to more than 1 in every 5 Americans (22%), and 5% of the population will be 85 years old and older (Richie et al., 2019). Thus, I conducted this study to better understand the impact of neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values); mental health (i.e., feelings of depression), and cardiovascular chronic illness (i.e., heart attack and stroke) among people 65 and older while controlling for sex, age, marital status, educational level, employment, and race to determine if there will be a need for enhanced care and support for people 65 and older to age in place.

In Section 1, I present the background, problem statement, purpose of the study, research questions and hypotheses, the theoretical framework of the socio-ecological model, nature of the study, and literature search strategy before reviewing the extant literature on the variables of neighborhood factors (i.e., trust, safety [afraid at night], and shared values), mental health (i.e., feelings of depression), and cardiovascular illness (i.e., heart attack and stroke). The section also includes a discussion of definitions,

assumptions, scope and delimitations, limitations, significance, and summary and conclusions.

Background

When researching the concept of aging in place, Graham et al. (2016) found that the primary purpose of doing so is to promote independence and prevent unwanted relocations; however, without additional support services, people 65 years old and older reported that it was challenging to stay in their homes as they age. Neighborhood factors play a crucial role in aging in place, but there is very limited literature on the perceived neighborhood factors that are associated with aging in place.

In this study, I focused on the influences of neighborhood factors (i.e., perceived trust, safety [i.e., afraid at night], shared values), mental health (i.e., feelings of depression), and cardiovascular chronic illness (i.e., heart attack and stroke) on aging in place. The study was needed to address the gap in the literature on this topic and make information on providing a better standard of living for people 65 and older available. This information on aging in place will assist in reducing the effects of disability among people 65 and older looking to stay in their homes as they age (see Szanton et al., 2016). As an example, Gonyea et al. (2018) found that providing older adults with support in reducing isolation and fear had a significant mediating effect on their adverse neighborhood perceptions.

Problem Statement

The inability to age in place among people 65 years old and older is a public health problem in the United States (Graham et al., 2018). In 2030, people 65 and older

likely experiencing a high burden of chronic illnesses will amount to 23.5% of the U.S. population (Rosenwohl-Mack et al., 2020). Aging in place is popular among people 65 and older so that they can avoid institutionalization and choose where and how they live (Rosenwohl-Mack et al.). Aging in place is viewed as less expensive and desirable compared to moving to an institution because without neighborhood support, the adverse effects of chronic illness and problems with mental health increase (Ailshire et al., 2017; Gonyea et al., 2018). According to Boqin et al. (2020), perceived adverse neighborhood characteristics are associated with chronic illness and depression, which leads to increased morbidity and mortality.

The desire to age in place amid adverse neighborhood factors, such as mistrust, feeling unsafe, and the lack of shared values, is a public health problem for many people in the United States. Adverse neighborhood factors increase issues in both physical (i.e., chronic illness, such as heart attack or stroke) and mental health (i.e., depression). Although researchers have investigated this issue, there is very little to no extant literature on people 65 and older experiencing adverse neighborhood factors that lead to chronic illness and adverse mental health. There is also a gap in the literature examining the relationship between trust, safety, shared values, and aging in place when controlling for sex, age, marital status, educational level, employment, and race. The goal of this study regarding adverse neighborhood factors was a health policy change that prioritizes people 65 and older for more support and services to combat unsafe neighborhoods and improve their physical and mental health.

Purpose of the Study

The purpose of this quantitative correlational study was to examine the relationship between neighborhood factors, cardiovascular illness, mental health, and aging in place, controlling for sex, age, marital status, educational level, employment, and race. This study was a secondary data analysis. The independent variables were neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), chronic cardiovascular illness (i.e., heart attack and stroke), and mental health (i.e., feelings of depression). The dependent variable was aging in place (i.e., as measured by time lived in an area). The controlling variables were sex, age, marital status, education level, employment status, and race.

Research Questions and Hypotheses

The primary research question was whether there is a relationship between aging in place (i.e., as measured by time lived in an area) among people 65 and older and neighborhood factors (i.e., trust, safety, and shared values), mental health (i.e., depression), and cardiovascular chronic illness (i.e., heart attack and stroke) while controlling for sex, age, marital status, educational level, employment, and race. The following research questions and hypotheses guided this study:

RQ1: What is the relationship between neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values) and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

$H_0$1: There is no relationship between neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

H_a1: There is a relationship between neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

RQ2: What is the relationship between (independent variables) cardiovascular chronic illness (i.e., heart attack, stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

$H_0$2: There is no relationship between (independent variables) cardiovascular chronic illness (i.e., heart attack, stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

H_a2: There is a relationship between (independent variables) cardiovascular chronic illness (i.e., heart attack, stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

RQ3: What is the relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), cardiovascular chronic illness (i.e., heart attack, stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

H_03: There is no relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), cardiovascular chronic illness (i.e., heart attack, stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

H_a3: There is a relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), cardiovascular chronic illness (i.e., heart attack, stroke), mental

health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

Socio-Ecological Model

The theoretical framework I used for this study was the socio-ecological model (SEM). The SEM is a theoretical framework comprised of a multilevel strategy and the idea that the behavior people exhibit is influenced by their attitudes and by the context of where they live (Bronfenbrenner, 1977; McLeroy et al., 1988). Several models have been developed to identify the socio-ecological approach of influences on human behavior; most definitions of the SEM identify the intrapersonal, interpersonal, organizational, community, and policy levels (McLeroy et al. 1988). Furthermore, the socio-ecological interrelation implies there are connections between the links of levels, which indicates that these levels influence each other (Golden & Earp, 2012; Meadows & Wright, 2008). The intrapersonal level relates to the lifestyle of older adults and how they chose to approach their health and mental well-being (McLeroy et al. 1988). For people 65 and older, factors such as knowledge level, talents, and image of oneself, are all part of the intrapersonal level. The interpersonal level makes up the support system for people 65 and older, which includes family, friends, and social connections. The organizational level includes parts of the community and their promotion of healthy behaviors. Culture plays a significant role in shaping healthy as well as unhealthy behaviors. The last level is comprised of policy, and the policy level relates to the policies and ordinances that are in

place to support older people's health and well-being. The policy level is macro, wherein policy changes extend to local, state, or federal levels.

In conducting this research, I used the SEM to examine the association between aging in place and neighborhood factors, mental health, and cardiovascular chronic illness. Using the SEM model is a common approach among researchers looking to examine the impact and connections between people and their environment (Stokols, 1992; Stokols et al., 2003). Whether it is trust, safety (i.e., afraid at night), shared values, mental health (i.e., feelings of depression), or cardiovascular chronic illness (i.e., heart attack and stroke), the positive effects of each element can be invaluable to the study of aging in place.

Nature of the Study

In this quantitative, retrospective study, I used secondary data. Quantitative research is a commonly used process to find general patterns among broader populations (Bloomfield & Fisher, 2019). All secondary data collected for this study were from the 2015–2016 National Social Life, Health, and Aging Project (NSHAP) data set (see Waite et al., 2019). I downloaded this data set with special permissions as an authorized user after special terms were agreed upon. To determine what neighborhood factors, adverse health (i.e., chronic cardiovascular illness) factors, and mental health factors are associated with aging in place, I used binomial logistic regression analysis of data from the NSHAP, controlling for sex, age, marital status, educational level, employment status, and race. This analysis will allow for the development of policy changes specific to people 65 and older looking to age in place.

Literature Search Strategy

In conducting this literature review, I used peer-reviewed, empirical literature published within the past 5 years, as well as older articles to align with the SEM framework as developed by its original author. I made a concerted effort to frame my research within the past 5 years; however, few articles were available specific to the topic of aging in place and neighborhood factors that were published in this timeframe. The following databases and search engines were used to search for empirical literature: CINAHL, Google Scholar, Medline, PsysInfo, ScienceDirect, and the Walden University Library website. The keyword search terms used were *aging in place (as measured by time lived in an area), trust, safety (afraid at night), shared values, chronic cardiovascular illness (heart attack, stroke),* and *mental health (feelings of depression).*

I searched for articles regarding how the theoretical foundation, the SEM, related to aging in place. I listed both the SEM and aging in place to yield articles relating to those specific variables. Despite finding many articles relating to aging in general, I found limited results specific to aging in place and neighborhood factors. The articles only related to aging, in general, were dismissed. The limited number of articles published on neighborhood characteristics and aging in place indicate the gap in the literature and why this study was needed.

Theoretical Framework

SEM

The SEM is a framework comprised of several levels, including the interpersonal (individual), intrapersonal, organizational, community, and policy, that can be

implemented to understand the connections between people and their environment (McLeroy et al., 1988). The SEM is often used in research on the neighborhood factors, cardiovascular chronic illness, and mental health experienced while aging in place. One study applied the SEM to establish that interactions between an individual and their environment play a role in the individual's behaviors (Van Holle et al., 2016). Using data from 431 community-dwelling Belgian 65 and older, Van Holle et al. found neighborhood connections and highly walkable neighborhoods are important to physical activity and reduce sedentary behavior. Critical elements were the friendliness of the neighbors, social trust, having a close-knit neighborhood, and social diversity. Those 65 and older who engaged in daily physical activity saw the most health benefits as compared to their peer counterparts (Van Holle et al.).

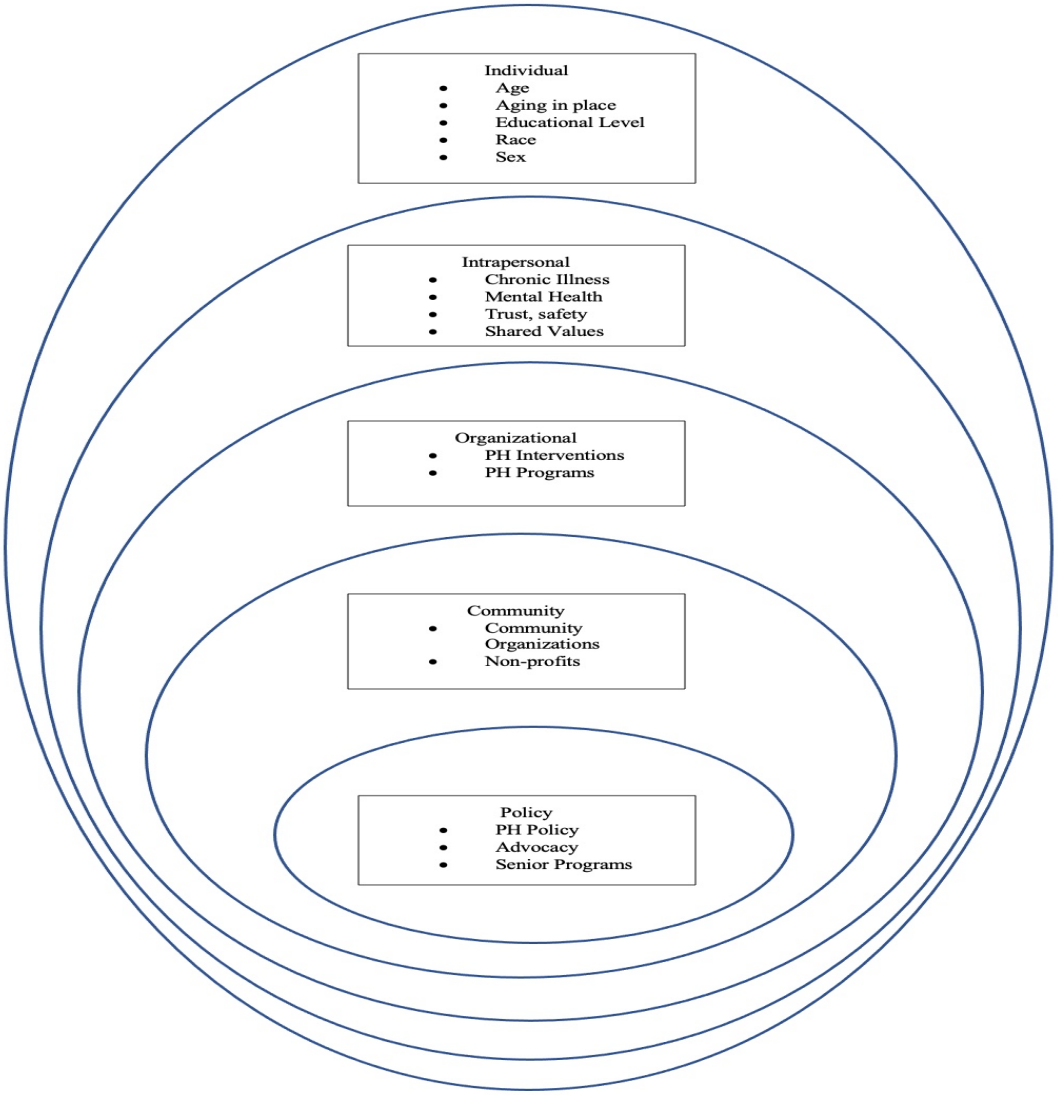
A second study used the SEM to determine the social factors influencing home care in community-dwelling older adults (Mah et al., 2021). In this quantitative study, Mah et al. searched six electronic databases with records from 2010 to 2020 to review articles, reference lists, and study documents from international entities. They conducted a scoping review and reported the results using the SEM as a justification. The main barriers identified as social factors influencing home care were age, gender, education, and ethnicity/race. It is important to note that the barriers to home care were limited to the individual classification level of the SEM (Mah et al.). Mah et al. recommended that researchers could use their results to identify where resources should be applied so that people 65 and older can live in their homes for as long as possible.

Theory Rationale

As discussed above, the SEM has been used as the theoretical framework in previous research to identify social-economic factors that influence health-related behavior. The SEM can be used to examine the way a person socializes in society and what interventions are needed to promote healthy behaviors (Glanz et al., 2015). Many researchers have conducted studies using the SEM to chart out interventions for aging in place, neighborhood factors, physical activity, home care, and other determinants of public health (Mah et al., 2021; Van Holle et al., 2016). Ascertaining which adverse impacts are the most prevalent neighborhood factors affecting individuals 65 and older who prefer to age in place was the purpose of this study. Using the SEM, I charted out the differences in the individual, intrapersonal, organizational, community, and policy SEM levels of neighborhood characteristics to determine the adverse impacts. Health promotion and interventions can help people 65 and older to stay in their homes as they age and reduce institutionalization. Linking people 65 years old and older to age-specific interventions that promote aging in place can result in positive social change and a better community. Figure 1 illustrates the SEM as it applies to neighborhood factors.

Figure 1

Socio-Ecological Model of Neighborhood Characteristics



Glanz, K., Rimer, B. K., & Viswanath, K. (2015). *Health Behavior: Theory, Research, and Practice*. John Wiley & Sons.

Literature Review Related to Key Variables

The differences in neighborhood factors and their impacts on physical and mental health for people 65 and older are important to aging in place. Age-friendly neighborhood characteristics are essential to older adults' health and well-being (Graham et al., 2018). In this portion of the literature review, I discuss the key variables of the study and how each variable is related to adverse neighborhood factors and, more specifically, to aging in place.

Aging in Place

In this subsection, I present studies that pool variables together that examine aging in place. Graham et al. (2018) looked at the relationship between aging in place and the village model, which is a community with physical and social boundaries for older adults who have a common interest in aging in place. The village model's mission is to promote independence and unwanted moves (Graham et al.). The author conducted a cross-sectional survey of 1,753 current village residents from 28 villages throughout the United States and found positive perceived effects in social connections, health, mental health, and the capacity to age in place.

Rosenwohl-Mack et al. (2018) conducted a systematic review examining the experiences of older adults currently aging in place in the United States. They found that

each community was unique and complex; hence, such a broad perspective is limited, and each community should be evaluated by their independent settings.

Park et al. (2017) focused on the impacts of aging in place for vulnerable people compared to less vulnerable subgroups. In contrast to Graham et al. (2018) and Rosenwohl-Mack et al. (2018), Park et al. specifically looked at low-income older adults living in senior housing instead of those living in their own homes. The authors suggested that senior housing provided a supportive environment that promoted a positive health effect and aging in place. Low-income older adults were shown to benefit most from a supportive senior housing environment as compared to their higher income earning counterparts. Although Graham et al. concluded that the village model was linked to positive social connections, health, mental health, and the capacity to age in place, Park et al. determined that low-income older adults living in their own homes reported lower self-rated health.

The last study I examined regarding aging in place was an overview of the living environment and its effect on health and well-being for older adults. Using a survey, König et al. (2019) compared the living situations of older adults and their neighborhoods in the United States to those in Germany. The survey consisted of two main sections: questions concerning the neighborhood and current living situation (i.e., safety, transportation, and distance to necessities) and queries focusing on people's physical and emotional needs. Although König et al. found that respondents in Germany had higher expectations of their living environment and took more advantage of the available amenities as compared to Americans, the authors did not examine the income ratios.

However, Graham et al. (2018), Rosenwohl-Mack et al. (2018), Park et al. (2017), and König et al. all noted a common theme that social connections and physical activity are related to better health which, in turn, promotes healthy aging. Thus, neighborhood design and social support play a significant factor in the ability to stay in one's home as one ages (König et al.).

Neighborhood Factors and Aging in Place

Multiple researchers have examined the social factors of neighborhoods and their effect on aging in place. Gan et al. (2021) specifically looked at neighborhood factors that promote the well-being of older adults, using quantitative data from 601 communities of adults over the age of 50 to analyze perceived neighborhood friendships and neighborhood environment. The researchers found that better neighborhood experiences were linked to positive physical and mental health outcomes for older adults. In contrast, poor neighborhoods were shown to cause adverse mental health for older adults. Depressive symptoms were found to be better controlled through positive neighborhood perceptions, while age-friendly environments and neighborhood connections were thought to benefit older people both mentally and physically (Gan et al.).

Besser et al. (2017) reviewed studies and dissertations (i.e., cohort studies, clinical trials, telephone interviews, and surveys) from various online databases, including PubMed, Web of Science, and ProQuest Dissertations and Theses Global Exposure, to test their hypothesis that a complex neighborhood environment can help delay cognitive decline in older adults 65 and older. The authors focused on neighborhood factors and their association with social-economic status and mental health decline, looking at

demographics, design, and age-friendly characteristics and their adverse impacts on older people. The researchers found a significant link between neighborhood factors and mental health decline.

Trust, Safety, Shared Values, and Aging in Place

Several studies have shown that those people who feel distrust, unsafe, and do not share the same values in their neighbors find it difficult to age in place. Gonyea et al. (2018) noted unsafe feelings, discomfort, and a lack of social connections is more common among low-income older adults and can lead to financial deprivation, transient housing, and social isolation. Finlay et al. (2018) had similar findings. Their article begins with a first-person account of a 78-year-old woman named Millie who now questions the safety of her neighborhood but refuses to move, feelings that exemplify the thoughts and fears of the aging population in urban Minnesota. The authors, researchers from the University of Michigan and the University of Minnesota, aimed to identify built and social environmental characteristics essential to supporting low-income, older residents through interviews in three socio-economic and geographic areas of the metropolitan area of Minneapolis, Minnesota. Through their interviews, Finlay et al. found that four elements foster residential well-being and fulfillment: safety and comfort, service access, social connection, and stimulation. Finlay et al. concluded that neighborhoods that support social connections played a crucial role in individuals feeling part of a community and happy.

Gonyea et al. (2018) aimed to explore if perceptions of neighborhood safety are associated with depressive symptoms and whether a sense of community belonging can

help to mediate the depressive symptoms by interviewing older adults living in urban subsidized developments. The authors found that roughly 1 in 4 tenants interviewed reported clinically relevant depressive symptoms, which was higher than the estimated 8% to 15% prevalence in older U.S. adults living in subsidized housing. This increase shows the rising prevalence of depressive symptoms. Hong et al. (2018) noted that neighborhoods need to invest in green space, perceived safety, and social cohesion to support and alleviate the onset of depressive symptoms in older adults. Gonyea et al. observed that neighborhoods with higher crime rates, vacant housing, and blighted streets created unsafe feelings, which, in turn, contributed to depression. They suggested that future studies should explore longitudinal data and employ mixed methodology studies to establish connections between characteristics of the neighborhood and mental health outcomes.

Hong et al. (2018) studied the relationship between safety and green space in neighborhoods by evaluating independently living seniors from King County, Seattle, and the Baltimore, Maryland/Washington D.C. region using data from the Senior Neighborhood Quality of Life Study that measures green space, perceived safety, and social cohesion. Their findings suggested that neighborhoods with higher crime, vacated housing, and blighted streets contributed to unsafe feelings and depression. The researchers mentioned previous studies that showed that urban areas, vegetation, and public parks had been associated with crime because of the ability to hide criminal behavior. The authors found that the association between green space and perceived safety plays a role in the health outcomes for older adults, and the body of research

suggests that neighborhood characteristics in community support create trust, shared values, and friendships among older people (Hong et al.).

Cardiovascular Chronic Illness and Aging in Place

Several researchers have shown that older people who experience neighborhood adverse factors suffer from chronic cardiovascular illness (i.e., heart attack and stroke). In this subsection, I elaborate on the extant literature focusing on cardiovascular illness.

Stroke and Aging in Place

Claudel et al. (2019), from the National Institute of Health, examined the role of the neighborhood environment to understand obesity-related behaviors by using a mix of questionnaires and accelerometry to evaluate the physical activity and sedentary time of adults in Baltimore, Maryland. After Claudel et al. suggested that poor neighborhood and social environment perception are associated with physical activity and sedentary time across a socioeconomically diverse sample, Hu et al. (2020) noted that less active older adults are more likely to suffer from stroke. Thus, a physical environment that promotes active living may improve the neighborhood's social environment, which then increases physical activity and decreases sedentary time (Claudel et al.).

Hu et al.'s (2020) aim were to identify the risk factors of strokes at the neighborhood level by analyzing data from the Center for Disease Control and Prevention, the Census Bureau, and the Environmental Protection Agency using four tree-based machine learning approaches. The authors found key predictors of stroke, including a higher proportion of older or inactive residents, minority communities (Black and non Hispanic Black), lack of leisure time in neighborhood activity, lower household

income, and ozone levels in the air. Claudel et al. (2019) noted that the less active an older adult is, the more likely the person will suffer from a stroke. Thus, the results from these studies can be used to create a tailored community-based intervention program and assist in policy-making decisions (Hu et al.).

Heart Attack and Aging in Place

Jin et al. (2017) used secondary data analysis to collect data from 928 people 65 years and older, to examine cardiovascular death among community-dwelling seniors. To determine cardiovascular health, the researchers looked at seven health assessments and behaviors using a score 0 to 14, with higher scores equaling better cardiovascular health (Jin et al., 2017). They found that, at a 9.1-year follow-up, 40% of the participants' deaths were due to cardiovascular disease. Thus, the results from this study can be used to promote health behaviors that will help in avoiding cardiovascular disease (Jin et al.).

Fraile-Bermúdez et al. (2017) sought to determine if physical activity and diet played a role in predicting cardiovascular risk among women 60 years and older by examining 65 women's daily life. Their hypothesis was that there is strong scientific evidence to support the association between diet, physical activity, and cardiovascular risk among women 60 and older (Fraile-Bermúdez et al.). Earlier studies had looked at physical activity but rarely measured both diet and physical activity together to predict cardiovascular risk; they further hypothesized that the results of their study would help in the design and implementation of proven interventions to promote healthy aging.

Mental Health and Aging in Place

Multiple researchers have studied mental health to determine how those complex medical conditions contribute to depression, and more specifically, aging in place. Below you will find a synopsis of the current literature to show the association between mental health and successful aging in place.

Smith et al. (2018) conducted a study in the United States to examine neighborhood growth and gentrification. The authors built on Ruth Glass's work in the 1960s when scholars had an understanding that the process of gentrification involved rebuilding low-income neighborhoods into higher income-based communities (Smith et al., 2018). Although aging in place was not the focus of the author's research, it included older vulnerable people's mental health due to changes in their neighborhoods (Smith et al., 2018). The authors found that regardless of income level, older people experiencing gentrification in their neighborhoods suffer from a higher rate of depression and anxiety than those not experiencing gentrification (Smith et al.). However, Park et al. (2018) noted senior housing is also a contributor to depressive symptoms, and people in senior housing experiencing gentrification are more likely to be mentally depressed. Thus, gentrification raises concerns for vulnerable populations, and positive social change should be a consideration when developers contract changes to low-income, diverse neighborhoods (Smith et al.).

Park et al. (2018) conducted a study on the different experiences of people while aging in place; the population they examined was much like the current study. The research modeled older depressive people living in senior housing; focusing on senior

housing using the life-course and person-environment fit perspectives that are over time and differential in a diverse population (Park et al.). The researchers found that older people at low socioeconomic status have higher levels of depression and mental disorders, which may increase as they age. Smith et al. (2018) noted there are ways to address depressive symptoms among older adults that include policymakers and practitioners creating ways to support moving older adults who are depressed to their desired neighborhoods.

Age and Aging in Place

Looking at the relationship between age and aging in place in the literature resulted in several studies centered on neighborhood factors. As individuals age, age-friendly neighborhood characteristics become more important to staying in one's home. Below will include literature comparing age and the ability to age in place.

Won et al. (2016) noted that the aging population is expected to increase worldwide and is a global concern. Adults over the age of 65 are estimated to account for 1.5 billion people by 2050, and people 50 and older will account for 132 million by 2030 (Won et al.). The authors examined peered-reviewed studies for neighborhood adverse factors specific to older adults where the search included databases CINAHL, Embase, MEDLINE, SportDis, and Transportation Databases. Won et al. found neighborhood factors such as safety, walkability, and crime played a role in older people's increased adverse physical health.

Lehning et al. (2015) explored the expectation for older people to stay in their homes as they age. The authors sampled 1,376 adults aged 60 and older living in Detroit

and examined the link between age-friendly social and physical environment factors; they found that low-income older adults were more likely expected to stay in their homes as they age than their wealthy counterparts (Lehning et al.).

Richie et al. (2019) focused on the impacts of community health and wellness in developing age-friendly communities. The researchers specifically looked at ensuring policy initiatives that promoted community independence in older people by using their many skills and talents over time (Richie et al.). The results showed access to age-friendly programs and community workshops was extremely useful to people 65 and older to assist in aging in place (Richie et al.)

Educational Level and Aging in Place

Samuel et al. (2015) looked at the association between education and physical limitations in older adults. The researchers found that an unkept house and neighborhood were linked to less educated individuals, impacted physical health, and chronic illness (Samuel et al.). The authors suggested that there are other pathways associated with unkept households and streets, in addition to an individual's educational level (Samuel et al.). Ward et al. (2018) conducted a study in the Sacramento area neighborhoods to examine the rate of depression and language barriers among older Latinos. The authors found the average educational level was 7.2 years, whereby less education resulted in the onset of depression, in contrast to those living in English-only neighborhoods with more education that has fewer depressive symptoms (Ward et al.).

Race and Aging in Place

Epps et al. (2018) conducted a culturally competent community health assessment to examine the challenges for older individuals in African American urban neighborhoods. The authors, researchers from Georgia State University, explored challenges and resources in place for older African American adults living with dementia and their families by performing a culturally informed communities health assessment in Fulton and Dekalb counties, Georgia (Epps et al.). The researchers noted the common challenges of the community studied included shame, improper housing, financial constraints. Johnson and Lian (2018) suggested a focus on the most vulnerable group of older African American women implementing a policy-based approach in education, higher paying jobs, and social support in childcare, while Epps et al. believed that providers and practitioners use of community-oriented approaches in planning and care coordination, increased public health policy, and primary health care will produce better long-term health outcomes.

Johnson and Lian (2018), researchers from the University of North Carolina in Chapel Hill, aimed to create a demographic profile, develop a household typology, and identify barriers and challenges preventing older African Americans from aging in place using their earlier research, the Public Microdata Sample file of the American Community Survey, and a pooled database of the five most recent annual surveys. The authors' found that the most vulnerable group was older African American females because of statistically lower education, lower paying jobs, and the responsibility of taking care of an older child or grandchildren (Johnson & Lian). Epps et al. (2018) noted

that there is a lack of attention to vulnerable subgroups in urban settings that are not age friendly. Thus, strategies to improve the success of aging in place for African American includes the federal government providing recommendations for age-friendly-building upgrades, expanding the Home Repair Program, and increasing funding for Medicaid (Johnson & Lian).

Ward et al. (2018) found that adverse neighborhood characteristics impact older Latino individuals' mental health. The researchers examined language barriers and isolation among 1789 older Latinos from a U.S. Census database in the Sacramento area. The results showed that older Latinos experienced an increased rate of depression and adverse mental health due to their neighborhoods, where only Spanish was spoken, being cut off from society compared to English-only neighborhoods (Ward et al.).

Other Potential Confounding Variables

The last three variables (sex, marital status, and employment status) I included in the analyses have not been studied cohesively in the literature found. Sex was clumped into aging in place in a general sense in the literature (Tomioka et al., 2017). Marital and employment status resulted in few matches that would fit the topic. Including these variables would require foundational work to determine what differences may exist in terms of aging in place and how they contribute to positive social change (Sheppard et al., 2020; Veruer et al., 2019: Yang & Moorman, 2021).

Social Change and Aging in Place

Aging in place, when discussed, has potential for social change. The risk of adverse neighborhood impacts for people 65 and older is a worldwide public health

problem, and the determination of risk factors can help create new programs to address future issues. The variables discussed, if found to have a significant risk for causing adverse mental health, chronic cardiovascular illness, and being afraid, could result in new programs and interventions which would be a considerable impact on social change.

Definitions

The age variable definition is defined as self-reported as to how old a person is in years on a given day with no mention of number of months from 65 to 95 years (Waite et al., 2019).

The variable aging in place is measured by time lived in this area in years (Waite et al., 2019).

The cardiovascular chronic illness variable (heart attack) is a self-reported measure of whether an individual ever had a heart attack (Waite et al., 2019)*?*

The cardiovascular chronic illness variable (stroke) is a self-reported measure of whether an individual had a stroke in the last 5 years (Waite et al., 2019)*?*

The educational level variable is self-reported as high School, high school equivalent, vocational certificate, some college, associates, bachelors or more (Waite et al., 2019).

The Employment status variable is self-reported as currently working using yes or no responses (Waite et al., 2019).

The Marital Status variable is self-reported as married, living with partner, separated, divorced, widowed, or never married (Waite et al., 2019).

The Mental health variable is a self-reported measure from the Center for Epidemiology Studies Depression Scale of whether felt depressed rarely, none of the time, some of the time, occasionally, or most of the time (Waite et al., 2019).

The race variable is self-reported as White, Black, Hispanic, non black, or other (Waite et al., 2019).

The safety variable measure is whether people in this area are afraid at night using responses of strongly disagree, disagree, neither agree nor disagree, agree, or strongly agree (Waite et al., 2019).

The shared values variable measure is whether people in this area do not share the same values using responses of strongly disagree, disagree, neither agree nor disagree, agree, or strongly Agree (Waite et al., 2019).

The sex variable is measured by self-identified as male or female with no other binary options (Waite et al., 2019).

The trust variable is measured by whether people in this area can be trusted using responses of strongly disagree, disagree, neither agree or disagree, agree, or strongly agree (Waite et al., 2019).

Assumptions

All assumptions and limitations stem from the use of this available public collection data set. The researchers involved with the creation of this data set collected data in three waves, Wave 1, Wave 2, and Wave 3, which was assumed to provide a complete history for respondents across all waves. Although a new cohort added in Wave 3 was selected from a national frame with the same criteria, it was not the same as that

used to select the original cohort in Waves 1 and 2, because African Americans and Hispanics sampled at a higher rate (Wait et al., 2019). Moreover, without involvement in the research design and instrument selection, these data sets collected were not intended to answer my specific research questions (Waite et al.). I am assuming that the neighborhood factors that are listed are those that lead to successful aging in place and may not represent all factors that people 65 and older experience.

Scope and Delimitations

Aging in place is a broad term used in many different circumstances, which include people who reside in villages, facilities, and assisted living. In this study, I focused on individuals who live in their own home's neighborhood characteristics and their impacts on aging in place. I specifically looked at neighborhood factors to establish who may be most at risk for adverse physical and mental health. The SEM helped in understanding this research because it focuses on the complex, interconnected relationships between individuals as compared to the health belief model that predicts health behaviors, attitudes, and perceived benefits. The secondary data analyses of the self-reported responses to their neighborhood experiences from 2015 to 2016 of people 65 and older. I used these databases because the collection was a population-based study of health and social factors, focusing on understanding the well-being of older, community-based individuals, using these older data sets because they are the latest collection provided by NSHAP. The study includes people from across the United States who were ages 65 and older looking to stay in their homes as they age; however, the study will not include people aged under 65.

Limitations

One of the limitations of this study is the use of a secondary data set and self-reported responses (Yang & Moorman, 2021). Without involvement in the research design and instrument selection, I must adapt the data collected by other researchers for other purposes to answer my specific research questions. Since the concept of aging in place is new, there is little peer-reviewed longitudinal literature focusing on the effects of aging in place on adults 65 years of age and older. Therefore, without peer-reviewed longitudinal research, it is difficult to establish causal connections between adverse neighborhood characteristics, physical and mental health.

Significance

As previously discussed, this study is significant in that it will fill the gap of knowledge on the adverse health impacts of neighborhood characteristics (i.e., trust, safety [i.e., afraid at night], and shared values) and aging in place (i.e., as measured by time lived in an area) its association with mental health (i.e., feelings of depression) and chronic cardiovascular illness (i.e., heart attack and stroke) among people 65 and older in the United States, which is currently limited. As to potential contributions, this study will advance knowledge of the discipline and assist in improving our understanding of the need for enhanced care and support needed by people 65 and older to age in place. The study is beneficial to public health practitioners by providing science-based data on the health determinants that increase adverse mental health (i.e., feelings of depression) and chronic cardiovascular illness (i.e., heart attack and stroke) that may impact people 65 and older while aging in place. This study's findings will advance public health practice

by the development of age specific health interventions to meet the specific needs of people 65 and older.

This study's implications for positive social change include partnerships between health educators, public health practitioners, and community organizations in developing neighborhood safety committees that prioritize people 65 and older. As a collective partnership, health interventions could also consist of family, friends, and nonprofit organizations to develop health programs that focus on people 65 and older aging in place. This study's findings also contributed to advocacy in health policy change to address the growing need for services and support for people 65 and older living in unsafe neighborhoods that are contributing to their adverse physical and mental health.

Summary and Conclusions

This study introduces neighborhood factors, physical, and mental health, and aging in place for people 65 and older. Neighborhood factors that play a role in increased morbidity and mortality among people 65 and older. As a result, communities struggle to provide age-friendly safe neighborhoods for older adults who find it challenging to remain in their homes as they age. In this study, I focused on the association between aging in place and neighborhood factors, which include trust, safety (i.e., afraid at night), shared values, mental health (i.e., feelings of depression), and cardiovascular chronic illness (i.e., heart attack and stroke), among people 65 and older. Adverse neighborhood factors contribute to whether an older person can or cannot successfully age in place and is a public health problem. A transitory background of the study was furnished, which included the gap in the literature and study methods. Lastly, the SEM illustrated the gap

between the perceived neighborhood factors that add to adverse mental health and chronic cardiovascular disease. Section 2 includes the research design and data collection rationale.

Section 2: Research Design and Data Collection

Introduction

For this study, I implemented a quantitative retrospective research design and secondary data analysis to explore the association between neighborhood factors, physical and mental health, and their impact on aging in place. The dependent variable in this study was aging in place. The independent variables in this study were trust, safety (i.e., afraid at night), shared values, cardiovascular chronic illness (i.e., heart attack and stroke), and mental health (i.e., feelings of depression). The variables that I used to control for were sex, age, marital status, education level, employment status, and race. I used binomial logistic regression to test whether any of these variables are associated with aging in place.

In Section 2, I summarize the problem and purpose, describe the study variables and research design, and presented the rationale for choosing the research design. In the Methodology subsection, I describe the respondent participants, sampling procedures, secondary data set used, and data analysis plan. The Threats to Validity subsection contains a discussion of the threats to both external and internal validity.

Research Design and Rationale

I employed a quantitative retrospective research design to determine if there is an association between neighborhood factors, cardiovascular chronic illness, mental health, and aging in place. The dependent variable in this study was aging in place (i.e., measured by time lived in an area). The independent variables were trust, safety (i.e., afraid at night), shared values, cardiovascular chronic illness (i.e., heart attack and stroke), and mental health (i.e., feelings of depression), while the confounding variables were sex, age, marital status, educational level, employment status, and race.

In this study, I used a retrospective study design due to the use of a secondary data set from the NSHAP. The data provided by NSHAP are publicly available for use upon agreeing to terms of use. I used this research design to answer the research question of determining the extent of neighborhood factors, cardiovascular chronic illness, and mental health individually contribute to aging in place (i.e., measured by time lived in an area) for people 65 and older. I conducted a bivariate analysis for each independent variable to determine the association with the dependent variable.

Methodology

Study Population

The target population for this study was a nationally representative probability sample of community-dwelling individuals between the ages of 65–95 years old selected from households across the United States. I selected this target population because the NSHAP is a population-based study of health, social life, and well-being among older Americans that describes the contents of the distribution and provides information

necessary to analyze the data that are publicly available. I used data from participants who lived in the United States during the years of 2015 and 2016. These were the last 2 years of data available. The study population available in the data set was over 4,500 respondents. Before collecting and analyzing any data for this study, I received approval from the Walden University Institutional Review Board (IRB). The IRB approval number is 03-17-22-0506176.

Sampling Procedures Used by Original Creators of the Data Set

The creators of the NSHAP data set used a random sampling strategy. To generate data, the creators of the NSHAP data set used specific procedures, such as probability sampling, which allowed them to make strong statistical inferences about the whole group. Exclusion criteria for the data set were in Waves 1 and 2, while in Wave 3, African Americans and Hispanics were sampled at a higher rate. Spouses or coresident partners of sampled respondents were included in Wave 3. The data were made publicly available, and no special procedures were noted in obtaining that data, with the exception of agreement with the terms of use.

To access the data, users must agree to the terms of use agreement as defined by NSHAP, which include (a) be a student at a member institution, (b) agreeing with the terms of privacy of research subjects, (c) agreeing to not redistribute data, and (d) citing the source of the data. The NSHAP data set has been demonstrated to be reputable and creditable because of the involvement of the National Opinion Research Center, which, along with principal investigators at the University of Chicago, conducted more than 3,000 interviews during 2005 and 2006 with a nationally representative sample of adults

aged 57 to 95. The researchers focused on older individuals' demographic factors, such as sex, age, education, race, social networks, and physical and mental health, which justifies why this data set represented the most appropriate source for this study.

I used the G*Power software tool to calculate the sample size for this study. I selected the effect size of 0.3 to cover a small to medium effect. I set the power to a standard of 0.8 and the alpha level at 0.05, which is customary (Heinrich Heine Universitat Dusseldorf, 2020). Since there were 13 independent variables, the sample size needed to reach statistical power resulted in 352 respondents. This result is sufficient in supporting the database of over 4500 respondents.

Instrumentation and Operationalization of Constructs

As noted above, I used the NSHAP data set, which was appropriate for this study because the NSHAP collected data aimed at understanding the well-being of older, community-dwelling Americans related to their health and social factors. There were three waves of data collection. The core files in Waves 1 and 2 included information on demographic factors, social networks, and physical and mental health. Wave 3 was conducted from 2015 thru 2016, wherein 2,409 surviving Wave 2 respondents were reinterviewed. A new cohort of adults born between 1948 and 1965, together with their spouses or coresident partners, were added. Wave 3 included core data, social network data, disposition of returning respondent's partner data, and proxy data. The data were collected in all three waves from both respondents and their partners. Thus, the NSHAP data set is valid and reliable because it has reached data collection saturation by including 3 Waves of data collection over time.

Operationalization of Variables

In the following subsections, I provide a description of each variable used in this study, comprising its definition and how it was measured.

Operationalization of Confounding Variables

A respondent's sex was treated as a confounding variable and defined as self-identification as male or female with no category of other identifications. Age was treated as a confounding variable and defined as respondents between the age of 65 to 95 years old. I treated marital status as a confounding variable and defined it as 1 = married, 2 = living with partner, 3 = separated, 4 = divorced, 5 = widowed, and 6 = never married. Race was treated as a confounding variable and was defined as self-identification as 1 = White/Caucasian, 2 = Black/African American, and 3 = Asian/Pacific Islander, American Indian, or Alaskan Native. I treated the educational level as a confounding variable and defined it as a self-report of 1 = high school, 2 = high school equivalent, 3 = vocational certificate, and 4 = bachelor's degree or more. Employment status was treated as a confounding variable and was defined as self-reported as currently working 0 = no and 1 = yes.

Operationalization of the Dependent Variable

I treated aging in place (i.e., as measured by timed lived in this area) as the dependent variable and defined it as 1 = 1–25 years and 2 = 26 or more years.

Operationalization of Independent Variables

I treated trust (i.e., as measured by people in this area can be trusted) as an independent variable and defined it as self-reported 1 = strongly disagree, 2 = disagree, 3

= neither agree nor disagree, 4 = agree, and 5 = strongly agree. Safety (i.e., as measured by people in this area are afraid at night) was treated as an independent variable and defined as 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree. I treated shared values (i.e., as measured by people in this area do not share same values) as an independent variable and defined it as 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree. Cardiovascular chronic illness (heart attack; as measured by ever had a heart attack?) was treated as an independent variable and defined as 0 = no, 1 = yes, 3 = not applicable, and 2 = do not know. Cardiovascular chronic illness (stroke; as measured by had stroke in last 5 years?) was treated as an independent variable and defined as 0 = no, 1 = yes, and 2 = do not know. I treated mental health (feelings of depression; as measured by felt depressed) as an independent variable and defined it as 1 = rarely or none of the time, 2 = some of the time, 3 = occasionally, and 4 = most of the time.

Data Analysis Plan

I used IBM Statistical Package for Social Sciences (SPSS) Version 28 to conduct all statistical testing. The data cleaning and screening procedures appropriate for this study were conducted by the creators of the NSHAP Wave 3 data set. The goal for this quantitative study was to examine if various neighborhood factors lead to successful aging in place by understanding the association between the controlling variables of sex, age, marital status, educational level, employment, and race; the independent variables of trust, safety, shared values, heart attack, stroke, and depression; and the dependent

variable of aging in place. I conducted descriptive statistical tests on these variables, including frequencies and percentages.

The research questions and hypotheses that guided this study were:

RQ1: What is the relationship between neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values) and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

$H_0$1: There is no relationship between neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

H_a1: There is a relationship between neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

Table 1 shows the difference between the variables used for RQ1.

Table 1

Confounding, Independent, and Dependent Variables Used for Research Question 1

Confounding Variables	Independent Variables	Dependent Variables
Sex	Trust	Aging in place
Age	Safety	
Marital status		

Educational level
Employment
Race

RQ2: What is the relationship between (independent variables) cardiovascular chronic illness (i.e., heart attack, stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

$H_0$2: There is no relationship between (independent variables) cardiovascular chronic illness (i.e., heart attack, stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

H_a2: There is a relationship between (independent variables) cardiovascular chronic illness (i.e., heart attack, stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

Table 2 shows the difference between the variables used in RQ2.

Table 2

Confounding, Independent, and Dependent Variables Used for Research Question 2

Confounding Variables	Independent Variables	Dependent Variables
Sex	Heart attack	Aging in place
Age	Stroke	
Marital status	Depression	
Educational level		
Employment		
Race		

RQ3: What is the relationship between (independent variables) neighborhood factors, (i.e., trust, safety [i.e., afraid at night], and shared values), cardiovascular chronic illness (i.e., heart attack, stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

$H_0$3: There is no relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), cardiovascular chronic illness (i.e., heart attack, stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

H_a3: There is a relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), cardiovascular chronic illness (i.e., heart attack, stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

Table 3 shows the difference between the variables used in RQ3.

Table 3

Confounding, Independent, and Dependent Variables Used for Research Question 3

Confounding Variables	Independent Variables	Dependent Variables
Sex	Trust	Aging in place
Age	Safety	
Marital status	Shared values	
Educational level	Heart attack	
Employment	Stroke	
Race	Depression	

To address these questions, I conducted inferential statistics testing using binomial logistic regression. I used bivariate and multivariate analyses to identify if the combination of independent variables is associated with aging in place. I used SPSS Version 28 to conduct all statistical testing.

Table 4

Summary of Statistical Tests Used to Test the Hypotheses

Research Questions	Level of Measurement	Tests
Research Question 1 (RQ1): What is the relationship between neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared value), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?	Nominal	Binomial logistic regression
Research Question 2 (RQ2): What is the relationship between (independent variables) cardiovascular chronic illness (i.e., heart attack and stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area) among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?	Nominal	Binomial logistic regression
Research Question 3 (RQ3): What is the relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), cardiovascular chronic illness (i.e., heart attack and stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?	Nominal	Binomial logistic regression

I used binomial logistic regression to test the assumptions for valid results. I tested for multicollinearity by using SPSS and the tolerance and variance inflation factor (VIF) test to determine if the VIF values are greater than 10 and tolerance values less than 0.2 which would show evidence that multicollinearity is present. To test the assumptions of binomial logistic regression, the dependent variable will be measured on a dichotomous scale. I recoded the variable into two categories from eight categories using

midpoint coding to calculate the midpoint values of each response to meet this assumption (Displayr, 2019). The second assumption the variable is categorical (i.e., ordinal, or nominal variable). The third assumption is the independence of observations and that the dependent variable is mutually exclusive. The fourth and final assumption is a linear relationship between any continuous independent variables and a logit transformation of the dependent variable. I tested for linearity using SPSS and the B-coefficient. The B-coefficient measures the degree of change in the outcome variable for every unit of change in the predictor variable. The slope line should be linear between the log odds for logistic regression (Laerd Statistics, 2018). The procedure I used to account for binomial logistic regression statistical tests is to run a binary logistic regression by entering SPSS control variables in block 1 of 1 and entering the predictor variables in block 2 of 2. Logistic regression analysis allows a constructed variety of regression models from the data set. For this study, I used the logistic regression options, a procedure for variable selection where all variables in a block were entered in a single step. The generated statistics include classification plots, Hosmer-Lemeshow goodness-of-fit, Casewise listing of residuals, and Confidence intervals (CI) for (odds ratio) exp(B) outputs.

Threats to Validity

The use of secondary data may lead to threats of external validity. This is because, without involvement in the research design and instrument selection, the study sample may not reflect the attitudes of the entire population. Accuracy and validity of the reported data to NSHAP included an updated collection of Core Data, Social Network

Data, Disposition of Returning Respondent Partner Data, and the Original NSHAP Wave 3 data files helped in the initiating of external validity. Because the NSHAP Wave 3 included updated data, the risks of external validity were reduced, and the research results were generalized to other studies. The internal validity may be impacted because of the use of logistic regression. It is unfeasible to test all variations of variables that may impact aging in place because of the use of secondary data. The only variables tested are those selected in the dataset.

Ethical Procedures

The anonymity and security of the data set begin with the NSHAP data, which are not available for web download and are covered under a restricted use agreement with the University of Chicago. To protect the respondent's confidentiality, the actual date of the interview was withheld and stored in a single numeric variable for all non missing cases. To protect the confidential data, users agreed to password protection for all files containing data; that removable storage media holding data be kept in a locked compartment or room when not in use; that data or analysis output derived from data would not be transmitted via email, email attachments, or FTP; that no backup copies of data would be stored, or data would be stored in strongly encrypted form. Another ethical issue related to the NSHAP data is that a copy of IRB approval for use of the data is required which typically falls under an Exempt 4 classification for secondary data analysis. A data protection plan is included in the user agreement with a description of how the NSHAP data will be stored at the user’s worksite and how data will be protected from unauthorized access on a computer network.

Summary

This section provided an identification of the research design, data collection, methodology, data analysis plan, threats to validity, and their connection to the research questions. The data sources were identified as well as how the data was handled, the data analysis plan, and the ethical procedures provided by the creators of the original data set to ensure the anonymity and security of the respondents and the data set.

Section 3: Presentation of the Results and Findings

Introduction

The purpose of this quantitative correlational study was to examine the relationship between neighborhood factors, cardiovascular illness, mental health, and aging in place, controlling for sex, age, marital status, educational level, employment, and race using secondary data analysis. The independent variables were neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values) chronic cardiovascular illness (i.e., heart attack and stroke), and mental health (i.e., feelings of depression). The dependent variable was aging in place (i.e., as measured by time lived in an area). The controlling variables were sex, age, marital status, education level, employment status, and race. The following research questions and hypotheses guided this study:

RQ1: What is the relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), and aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

$H_0$1: There is no relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

H_a1: There is a relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared

values), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

RQ2: What is the relationship between cardiovascular chronic illness (i.e., heart attack and stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

$H_0$2: There is no relationship between (independent variables) cardiovascular chronic illness (i.e., heart attack and stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

H_a2: There is a relationship between (independent variables) cardiovascular chronic illness (i.e., heart attack and stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

RQ3: What is the relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), cardiovascular

chronic illness (i.e., heart attack and stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

$H_0$3: There is no relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), cardiovascular chronic illness (i.e., heart attack and stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

H_a3: There is a relationship between (independent variables) neighborhood factors (i.e., trust, safety [i.e., afraid at night], and shared values), cardiovascular chronic illness (i.e., heart attack and stroke), mental health (i.e., feelings of depression), and (dependent variable) aging in place (i.e., as measured by time lived in an area), among people 65 and older, controlling for sex, age, marital status, educational level, employment, and race?

Section 3 includes the introduction, a discussion of the data collection of the secondary data set, and the results. In the Secondary Data Set Analysis subsection, I describe the time frame from which the data set was drawn and present any discrepancies in the use of the data set from the plan presented in Section 2. I also report baseline

descriptive and demographic characteristics of the sample and describe how representative the sample was from the population of interest. The Results subsection includes a discussion of the data analysis and findings, including the results of an inferential statistical analysis using a binomial logistic regression model. In the Summary, I provide an overview of the results related to each research question and transition to Section 4.

Accessing the Data Set for Secondary Analysis

In this quantitative retrospective study, I used secondary data from the NSHAP. Specifically, the Wave 3 data set, which was published in 2016 and included data from the year 2015, was used. I analyzed the data to determine if there is a difference in socioeconomic variables and aging in place.

The data set comprised over 4,500 respondents. As noted in Section 2, I used SPSS Version 28 to transform and recode age (labeled as age groups) and time lived in this area (i.e., age in place) into different variables. I used the study sample from the total respondents of the NSHAP data set population living in the United States from 2015 to 2016. The total number of respondents used for the study was 4,377. There were no discrepancies in the data collection plan presented in Section 2; therefore, no changes in the study were necessary.

Sample Characteristics

The confounding variables, which included respondent demographic characteristics, had several different degrees of variability. Some were close in values, and others were different values. Of the total respondents, 51.8% were aged 65 – 74, only

13.1% were above the age of 85, while 35.2% were aged 75–84. Sex was divided up so that 45.8% of respondents were male and 54.2% were female. Race for the study sample showed that 10.4% were Asian, Pacific Islander, American Indian, or Alaskan Native; 16.5% Black/African American; and 73.2% White/Caucasian. For marital status, the study sample broke down as follows: 62.9% were married, 3.2% were living with a partner, 1.9% were separated, 12.4% were divorced, 14.4% were widowed, and 5.2% were never married. In terms of educational level, 14.5% attended high school, 24% graduated high school or an equivalent, 34.7% had a vocational certificate/some college/associate degree, and 26.8% had a bachelor's degree or higher. Employment status showed those currently working at 36.8% and those not currently working at 63.2%. The frequencies and percentages for confounding variables are listed as shown in Table 5.

Table 5

Study Sample Characteristics: Confounding Variables

Confounding Variables	Frequency	Percentage
Age		
65–74	1,314	51.8%
75–84	893	35.2%
85–95	332	13.1%
Sex		
Male	2,003	45.8%
Female	2,374	54.2%
Race		
Asian, Pacific Islander, American Indian, or Alaskan Native	452	10.4%
Black/African American	719	16.5%
White/Caucasian	3,194	73.2%
Marital status		
Married	2,755	62.9%
Living with partner	139	3.2%
Separated	85	1.9%
Divorced	542	12.4%
Widowed	629	14.4%
Never married	227	5.2%
Educational level		
< High school	635	14.5%
High school equivalent	1,051	24%
Vocational certificate/some college/associate degree	1,520	34.7%
Bachelor's or more	1,171	26.8%
Employment status		
No (not working)	2,759	63.2%
Yes (currently working)	1,608	36.8%

Note. $N = 4{,}377$.

For the independent variables, I measured responses to the question of whether people in this area can be trusted in a 5-point, Likert scale format: 2% strongly disagreed, 5.7% disagreed, 34.5% neither agree nor disagree, 46.8% agree, and 11% strongly agree. For the variable of safety, agreement about people in this area being afraid at night was measured via a 5-point, Likert scale format: 16% strongly disagree, 42.4% disagree, 28.6% neither agree nor disagree, 9.9% agree, and 3.1% strongly agree. In response to the variable of people in this area do not share the same values, which was also in a 5-point, Likert scale format: 47.3% neither agree nor disagree, 7% strongly disagree, 28.5% disagree, 14.7% agree, and 2.5% strongly agree. For the variable of ever had a heart attack, 74.9% responded no and 25.1% responded yes. Responding to the question of whether they had a stroke in the last 5 years, 6.3% of participants said yes and 93.7% responded no. For the variable of feelings of depression, 66.9% self-reported they were depressed rarely or none of the time, 18.2% some of the time, 11.1% occasionally, and 3.8% most of the time. The frequencies and percentages for the independent variables are shown in Table 6.

Table 6

Study Sample Characteristics: Independent Variables

Independent Variables	Frequency	Percentage
Trust		
Strongly disagree	75	2%
Disagree	210	5.7%
Neither agree nor disagree	1,268	34.5%
Agree	1,720	46.8%
Strongly agree	403	11%
Safety		
Strongly disagree	587	16%
Disagree	1,557	42.4%
Neither agree nor disagree	1,050	28.6%
Agree	362	9.9%
Strongly agree	114	3.1%
Shared values		
Strongly disagree	257	7%
Disagree	1,043	28.5%
Neither agree nor disagree	1,733	47.3%
Agree	539	14.7%
Strongly agree	90	2.5%
Heart attack		
No	623	74.9%
Yes	209	25.1%
Stroke		
Yes	4,093	93.7%
No	273	6.3%
Depression		
Rarely or none of the time	2,924	66.8%
Some of the time	797	18.2%
Occasionally	485	11.1%
Most of the time	165	3.8%

Note. $N = 4{,}377$.

For the dependent variable of aging in place, 59.9% of respondents self-reported aging in place (i.e., time lived in the area) from 1 to 25 years and 40.1% 26 or more years. The frequencies and percentages for the dependent variable are shown in Table 7.

Table 7

Study Sample Characteristics: Dependent Variable

Dependent Variable	Frequency	Percentage
Aging in place		
1 to 25 years	2,218	59.9%
26 or more years	1,484	40.1%

In the examination of the study sample frequency tables and knowing that a random sampling strategy was done by the creators of the NSHAP data set, I determined that the study sample of 4,500 respondents was a firm representative of the full population of the data set, which made moving on to the research questions and the results possible.

Results

In this subsection, I discuss the results related to each of the three research questions and the statistical assumptions that I tested prior to moving forward with the statistical test.

Relationship Between Neighborhood Factors Trust, Safety (i.e., Afraid at Night), Shared Values, Sex, Age, Marital Status, Educational Level, Employment, Race, and Aging in Place

Looking at the data for RQ1, I could answer several of the assumptions related to the question. The dependent variable was dichotomous, and no outliers were present. I recoded the variable from eight to two categories using midpoint coding to calculate the

midpoint values of each response to meet this assumption (see Table 8). Relating to the second and third assumptions, the variables were categorical, independent of observation, and mutually exclusive, which is met by the nominal scale of measurement. The fourth assumption is a linear relationship between any continuous independent variables and a logit transformation of the dependent variable, in which none of these variables were used, so it was not necessary to test for this assumption. To test for multicollinearity, I used the VIF test in SPSS. The VIF test showed that no multicollinearity was present in the study variables for RQ1 due to the tolerance being greater than 0.2 and the VIF being less than 10 (see Table 9). Because all assumptions for this model were met, I conducted the binomial logistic regression analysis.

Table 8

Midpoint Coding Research Question 1: Aging in Place - Dependent Variable Recode

Range	Original/New Code	New Range
Aging in place		
Less than 1 year	1	1 to 25 years
1 to 5 years	2	26 or more years
6 to 10 years	3	
11 to 15 years	4	
16 to 20 years	5	
21 to 25 years	6	
26 to 50 years	7	
50 or more years	8	

Table 9

VIF for Research Question 1

Variable	Tolerance	VIF
Sex	.914	1.095
Age	.872	1.147
Marital status	.867	1.153
Educational level	.902	1.109
Employment	.942	1.061
Race	.942	1.062
Trust	.871	1.148
Safety	.813	1.230
Shared values	.876	1.141

As I move on to a discussion of the binomial logistic regression, it is necessary to explain the reference categories for each independent and controlling variable. For the variable of sex, female was the reference category. For the variable of age, I used 65 to 74 years old as the reference category. For the variable of marital status, married was the reference category. For the variable of educational level, I used some college as the reference category. For the variable of employment, not working was the reference category. For the variable of race, White/Caucasian was the reference category. For the variable of trust, I used to agree as the reference category. For the variable of safety, disagree was the reference category. For the variable of shared values, I used neither agree nor disagree as the reference category. For the variable of aging in place, 1 to 25 years was used as the reference category.

In conducting the binomial logistic regression model, I found the model not to be statistically significant ($p = .402$). The R^2 of the model was between 1.3% (Cox and Snell) and 1.8% (Nagelkerke), meaning that this specific model did not explain certainties of the variance in predicting aging in place. Looking at the individual variables

in the model, I found that the variables that did significantly predict aging in place were sex, age (65 to 74 years and 75 to 85 years), marital status, and educational level with the exception of age (85 to 95 years). Age 85 to 95 years ($p = 0.391$), employment status ($p = 0.514$), race ($p = 0.409$), trust ($p = 0.370$), safety ($p = 0.386$), and shared values ($p = 0.772$), had a significance that is not less than 0.05, so I excluded them from further analysis. Sex (female respondents) led to 1.23 higher odds of aging in place 1 to 25 years than their male counterparts ($p < 0.021$). Age (65 to 74 years and 75 to 85 years) led to .882 times higher odds of aging in place 1 to 25 years than those aged 85 to 95 years ($p = <.001$ and $p < 0.003$). Marital status (married) led to .943 higher odds of aging in place 1 to 25 years than being separated from a partner ($p < 0.021$). Educational level (some college) led to .899 higher odds of aging in place 1 to 25 years than individuals with less than a high school education ($p < 0.016$). The variables that were predictive of aging in place were sex, age, marital status, and educational level. See Table 10 for all statistics associated with RQ1.

Table 10

Logistic Regression Predicting Likelihood of Aging in Place based on Trust, Safety, shared Values controlling for Sex, Age, Marital Status, Educational level, Employment, and Race

	B	S. E	Wald.	*df*	*p*	Odds Ratio	95% C.I. for Odds Ratio Lower	Upper
Sex	.208	.090	5.294	1	.021	1.231	1.031	1.469
Age 65-74			13.937	2	<.001			
Age 75-84	-.435	.145	8.945	1	.003	.647	.487	.861
Age 85-95	-.125	.146	.735	1	.391	.882	.662	1.175
Marital status	-.059	.026	5.180	1	.023	.943	.896	.992
Educational level	-.106	.044	5.791	1	.016	.899	.825	.981
Employment	.076	.116	.425	1	.514	1.078	.859	1.092
Race	-.064	.078	.680	1	.409	.938	.805	.981
Trust	.052	.058	.805	1	.370	1.053	.940	1.180
Safety	-.042	.049	.751	1	.386	.959	.871	1.055
Shared values	-.015	.053	.084	1	.772	.985	.889	1.092
Constant	.343	.410	.702	1	.402	1.410		

Relationship Between Cardiovascular Chronic Illness (i.e., Heart Attack and Stroke), Mental Health (i.e., Feelings of Depression), Sex, Age, Marital Status, Educational Level, Employment, Race, and Aging in Place

Looking at RQ2, several of the assumptions were answered at first glance. The dependent variable was dichotomous, and no outliers were present (Table 8). To test for multicollinearity, I used the VIF test in SPSS. The VIF test showed that no multicollinearity was detectable in the study variables for RQ2 due to the tolerance being greater than 0.2 and the VIF being less than 10. See Table 11 for VIF statistics for RQ2.

Table 11

VIF for Research Question 2

Variable	Tolerance	VIF
Cardiovascular disease		
Heart attack	.938	1.066
Stroke	.961	1.041
Mental Illness		
Depression	.944	1.060
Sex	.874	1.144
Age	.858	1.166
Marital status	.829	1.206
Educational level	.916	1.092
Employment	.941	1.062
Race	.950	1.053

The last assumption that I tested was the idea that there is a linear relationship between the log odds and independent variables. This assumption is only relevant when continuous variables are used. Since none of the variables in this research question were continuous, it was not appropriate to test for this assumption. As all the assumptions for this model were met, the binomial logistic regression model will be analyzed.

However, before moving forward with binomial logistic regression, an explanation of reference categories for each independent and controlling variable will be addressed. For the variable sex, female was the reference category. For the variable age, 65 to 74 was the reference category. For the variable marital status, married was the reference category. For the variable educational level, some college was the reference category. For the variable employment, not working was the reference category. For the variable race, White/Caucasian was the reference category. The variable heart attack, (no, to ever had a heart attack) is the reference category. The variable stroke, (yes, stroke in the last 5 years) is the reference category. The variable depression, (rarely or none of the

time) is the reference category. For the variable aging in place, 1 to 25 years is the reference category.

In conducting the binomial logistic regression model, I found the model to not be statistically significant ($p = 0.477$). The R^2 of the model was between 4.4% (Cox and Snell) and 5.8% (Nagelkerke), meaning this specific model did not offer much of an explanation about the variance in predicting aging in place but was higher than RQ1. Looking at each variable in the model, I found most of the variables did not significantly predict aging in place. These variables included sex, educational level, employment status, race, heart attack, stroke, and depression. The variables that were predictive of aging in place were age and marital status. Sex had a significance of 0.120, the educational level had a significance of 0.068, employment had a significance of 0.222, race had a significance of 0.220, heart attack had a significance of 0.712, stroke had a significance of 0.218, and depression had a significance of 0.479, which were not levels that were less than 0.05, so I excluded them from further analysis.

Age was a predictor of aging in place, leading to .495 times higher odds of successfully aging in place than those aged 85 to 95 years ($p < 0.020$). A positive response to the question about marital status led to .858 times higher odds of aging in place than those who were never married ($p < 0.007$). The variables predictive of aging in place were age and marital status. See Table 12 for all statistics associated with RQ2.

Table 12 14

Logistic Regression Predicting Likelihood of Aging in Place Based on Cardiovascular Chronic Illness (Heart Attack and Stroke), Mental Health (Depression) Controlling for Sex, Age, Marital Status, Educational Level, Employment, and Race

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95% C.I. for Odds Ratio Lower	Upper
Sex	.307	.197	2.420	1	.120	1.359	.923	2.001
Age 65-74			7.776	2	.020			
Age 75-84	-.704	.274	6.601	1	.010	.495	.289	.846
Age 84-95	-.283	.271	1.095	1	.295	.753	.443	1.281
Marital Status	-.153	.056	7.372	1	.007	.858	.768	.958
Educational level	-.166	.091	3.336	1	.068	.847	.709	1.012
Employment	.309	.253	1.492	1	.222	1.362	.830	2.235
Race	.225	.183	1.506	1	.220	1.252	.874	1.793
Heart attack	.083	.225	.136	1	.712	1.087	.699	1.689
Stroke	.367	.298	1.516	1	.218	1.443	.805	2.587
Depression	-.079	.111	.500	1	.479	.924	.743	1.150
Constant	.382	.537	.506	1	.477	1.465		

Relationship Between Neighborhood Factors (i.e., Trust, Safety, [i.e., Afraid at Night], and Shared Values), Cardiovascular Chronic Illness (i.e., Heart Attack and Stroke), Mental Health (i.e., Feelings of Depression), Sex, Age, Marital Status, Educational Level, Employment, Race, and Aging in Place

Looking at RQ3, several assumptions were answered upon review. The dependent variable is dichotomous, and no outliers are present. To test for multicollinearity, I used the VIF test in SPSS. The VIF test showed that no multicollinearity was detected in the study variables for RQ3 due to the tolerance being greater than 0.2 and the VIF being less than 10 for all variables. See Table 13 for VIF statistics for RQ3.

Table 13

VIF for Research Question 3

Variable	Tolerance	VIF
Trust	.790	1.266
Safety	.770	1.298
Shared values	.799	1.251
Cardiovascular illness		
Heart attack	.944	1.059
Stroke	.927	1.078
Mental illness		
Depression	.919	1.088
Sex	.869	1.151
Age	.830	1.205
Marital status	.819	1.221
Educational level	.876	1.141
Employment	.934	1.070
Race	.945	1.058

The final assumption that I tested was that there is a linear relationship between the log odds and independent variables. Upon review, this assumption can only be examined when continuous variables are used; where there are no variables that are continuous, it is not necessary to test for this assumption. I proceeded with the binomial logistic regression since all the assumptions for this model were met.

However, prior to the binomial logistic regression testing, it is appropriate to first explain the reference categories for each independent variable. For the variable trust (people in this area can be trusted), agree was the reference category. For the variable safety (i.e., afraid at night), disagree was the reference category. For the variable values (people in this area do not share the same values), neither agree nor disagree was the references category. For the variable heart attack (ever had a heart attack), no is the reference category. For the variable stroke (had stroke in last 5 years), yes is the reference

category. For the variable depression (felt depressed), rarely or none of the time is the reference category. For the variable sex, female was the reference category. For the variable age, 65 to 74 was the reference category. For the variable marital status, married was the reference category. For the variable educational level, some college was the reference category. For the variable employment, not working was the reference category. For the variable race, White/Caucasian was the reference category.

In the statistical testing of the binomial logistic regression model, I found the model not to be statistically significant with a significance of 0.820, which is not less than 0.05. The R^2 of the model was between 4.4% (Cox and Snell) and 5.9% (Nagelkerke), meaning that this model did not explain much about variance in predicting aging in place. In the examination of the individual variables in the model, I found that most of the variables did not significantly predict aging in place; these include sex, educational level, employment status, race, heart attack, stroke, depression, trust, safety, and shared values. Sex ($p = 0.114$), educational level ($p = 0.085$), employment status ($p = 0.290$), race ($p = 0.147$), heart attack ($p = 0.575$), stroke ($p = 0.244$), depression ($p = 0.534$), trust ($p = 0.757$), safety (afraid at night) ($p = 0.958$), and shared values ($p = 0.886$), all had significance levels that were not less than 0.05, so they were not included in the analysis.

The variables that were predictive of aging in place for RQ3 were age and marital status. Age was a predictor of aging in place ($p = 0.032$) for those 65 to 74 years, who are more likely to stay in their homes as they age. Marital status was a predictor of aging in place ($p = 0.011$). When looking at categorical comparisons, those who were married had

.496 times higher odds of aging in place than those who were never married ($p = 0.011$). The variables predictive of aging in place were age and marital status. See Table 14 for all statistics associated with RQ3.

Table 14

Logistic Regression Predicting Likelihood of Aging in Place Based on Neighborhood Factors (Trust, Safety, [Afraid at Nigh], and Shared Values), Cardiovascular Chronic Illness (Heart Attack and Stroke), Mental Health (Depression) Controlling Variables

	B	S. E	Wald	*df*	*p*	Odds Ratio	95% C.I. for Odds Ratio	
							Lower	Upper
Sex	.318	.201	2.499	1	.114	1.374	.927	2.037
Age 65-74			6.866	2	.032			
Age 75-84	-.701	.284	6.108	1	.013	.496	.284	.865
Age 85-95	-.317	.278	1.293	1	.255	.729	.422	1.258
Marital status	-.147	.057	6.529	1	.011	.864	.772	.966
Educational level	-.162	.094	2.963	1	.085	.850	.706	1.023
Employment	.269	.254	1.121	1	.290	1.309	.795	2.155
Race	.273	.188	2.101	1	.147	1.314	.908	1.901
Cardiovascular illness								
Heart attack	.128	.229	.314	1	.575	1.137	.726	1.780
Stroke	.366	.315	1.357	1	.244	1.443	.7779	2.672
Mental health								
Depression	-.071	.114	.387	1	.534	.931	.745	1.165
Trust	.042	.134	.096	1	.757	1.042	.801	1.357
Safety	-.006	.109	.003	1	.958	.994	.803	1.231
Shared values	-.017	.115	.021	1	.886	.984	.785	1.233
Constant	.209	.921	.052	1	.820	1.233		

Summary

In this study, I found that the group of variables, sex, age, marital status, and educational level, all significantly predicted aging in place. I also showed that being female, age 65 to 74 years, and being married, and a level of some college education are predictors of aging in place. In Section 4, I will discuss the application of these results to professional practice and implications for social change, interpret the findings and discuss

the limitations of the study, recommendations, implications for professional practice and social change, and conclusions.

Section 4: Application to Professional Practice and Implications for Social Change

Introduction

The purpose of this quantitative correlational study was to examine the relationship between neighborhood factors (i.e., trust, safety, shared values), cardiovascular illness (i.e., heart attack and stroke), mental health (i.e., depression), and aging in place, controlling for sex age, marital status, educational level, employment, and race. In this study, I conducted a secondary data analysis to examine if there were certain neighborhood, physical, and mental health factors that would predict whether people 65 and older would likely age in place so that they can avoid institutionalization and choose where and how they live. The most important conclusion was that the variables predictive of aging in place were sex, age, marital status, and educational level.

Section 4 is comprised of six areas. In this Introduction subsection, I included the purpose of the study and briefly summarized the key findings. In the Interpretation of the Findings subsection, I described, in more detail, the findings and how they relate to the literature reviewed in Section 1. The Limitations subsection contains a description of the limitations of the study due to the use of secondary analysis and its impacts on the outcomes. In the Recommendations area, I discuss recommendations for further research to promote public health. The implications for professional practice and social change subsection includes a description of how this study enhances professional practice through the lens of the theoretical framework and the potential impact for positive social change for people 65 years old and older.

Interpretation of the Findings

Relationship Between Neighborhood Factors Trust, Safety (Afraid at Night), Shared Values, Sex, Age, Marital Status, Educational Level, Employment, Race, and Aging in Place

For RQ1, I examined neighborhood factors and socio-demographic variables and how they impact aging in place. However, before providing my interpretation of the findings regarding this research question, I will look at the R^2 of the model. For RQ1, the R^2 of the model was between 1.3% (Cox & Snell) and 1.8% (Nagelkerke). This means that a small portion of the variance in aging in place can be explained by the variables in the research question, and there are other factors that may predict aging in place. Trust, safety, shared values, employment, and race were found to not contribute to aging in place for the purposes of this study. I found sex to be significant and a predictor of aging in place ($p = 0.021$). A comparison between females and males showed females have 1.23 higher odds of aging in place. Age was also found to be significant, but when comparing those aged 65 to 74 years old and those between the ages of 75 to 84 years old, there were no significant differences found. The results for age show it is predictive of aging in place, but no comparisons can be made with the age groups selected for this study. I found marital status to be significant and a predictor of aging in place ($p = 0.023$). All marital status categories were less likely to age in place as compared to higher odd individuals who were married. Educational level was found to be significant and a predictor of aging in place ($p = 0.016$). All categories had a likely chance of aging in place when compared to those with less than high school education.

I found sex to be a significant predictor of aging in place. This finding supports those of Graham et al. (2018) who revealed that females have a higher odd of aging in place than their male counterparts. I also found age to be a significant predictor of aging in place (p =< 0.001). This finding supports those of other studies in the literature that have shown an expectation for older people aged 60 and over to stay in their homes as they age (see Lehning et al., 2015). I found marital status to be a significant predictor of aging in place (p = 0.023), which supports Yang and Moorman's (2021) findings that any change in marital status significantly impacts aging in place. I discovered no association between trust, safety, and shared values, although other studies (i.e., Finlay et al., 2018; Gonyea et al., 2018; Hong et al., 2018) found that people who distrust, feel unsafe, and do not share the same values in their neighborhood find it difficult to age in place. I also found no association between employment and aging in place, although Graham et al. found a high percentage of people 65 and older do not currently work. The current study results indicated that there was no association between race and aging in place, although other studies (i.e., Epps et al., 2018: Johnson & Lian, 2018; Ward et al., 2018) found that older African American females are most vulnerable to not successfully aging in place. I found the educational level to be a significant predictor of aging in place (p = 0.016). Regarding the theoretical foundation of the study, all the variables are related to the first level of the SEM. Support in SEM individual-level traits can assist in aging in place, with a focus on males, people 65 and older, who are single or without a partner, and their educational level.

Relationship Between Cardiovascular Chronic Illness (Heart Attack and Stroke), Mental Health (Feelings of Depression), Sex, Age, Marital Status, Educational Level, Employment, Race, and Aging in Place

For RQ2, I looked at neighborhood factors and socio-demographic variables and how they affect aging in place. Before moving on to my interpretation of the results, I will discuss the R^2 of the model. For RQ2, the R^2 of the model was between 4.4% (Cox and Snell) and 5.8% (Nagelkerke). This means these specific model variables did not offer much of an explanation about the variance in predicting aging in place, and there are many more factors that predict aging in place than those that were studied in the current study with these research questions. Sex, educational level, employment status, race, heart attack, stroke, and depression were not statistically significant and did not contribute to aging in place for the purposes of this study. Although overall age was found to be significant, there were no significant differences found between the 65 to 74 and 75 to 85 age ranges. This finding shows that age is predictive of aging in place, but there was no significant comparison of the specific age groups used in this study. For RQ2, marital status was found to be significant and a predictor of aging in place (p = 0.007). All marital status categories had higher odds of difficulty in aging in place except for those individuals who were married.

I found age to be a significant predictor of aging in place. This finding supports Lehning et al. (2015) who stated that people 65 and older are expected to stay in their homes as they age. I also found that marital status was a significant predictor of aging in place (p = 0.007), which supports other studies in the literature that have shown that

individuals who have a change in their marital status have difficulty aging in place (see Yang & Moorman, 2021). The current study results showed no association between educational level and depression with aging in place; however, Ward et al. (2018) found that older people with an average educational level of 7.2 years are more likely to suffer from depression. I also found no association between employment and aging in place. Race was also not associated with aging in place according to RQ2 either. However, Epps et al. (2018) found that African American adults living with dementia exhibit challenges to aging in place. Heart attack and stroke were also not associated with aging in place, although Claudel et al. (2019), Hu et al. (2020), and Fraile-Bermúdez et al. (2017) all linked obesity and a sedentary lifestyle to ill cardiovascular health. Regarding the theoretical foundation of the study, I found the significant variables were all related to the first level of the SEM; therefore, just as in the results section of RQ1, support in the SEM individual-level traits can assist in aging in place with a focus on age and marital status.

Relationship Between Cardiovascular Chronic Illness (Heart Attack and Stroke), Mental Health (Feelings of Depression), Trust, Safety, Shared Values, Sex, Age, Marital Status, Educational Level, Employment, Race, and Aging in Place

In RQ3, I focused on cardiovascular chronic illness, mental health, trust, safety, shared values, and socio-demographic variables. However, before sharing my interpretation of the results, I will discuss the R^2 of the model. For RQ3, the R^2 of the model was between 4.4% (Cox and Snell) and 5.9% (Nagelkerke). This means these specific model variables did not offer much of an explanation about the variance in predicting aging in place, and there are many more factors that predict aging in place than

those that were studied in the current study with these research questions. Sex, educational level, employment status, race, heart attack, stroke, depression, trust, safety, and shared values were found not to be statistically significant and did not contribute to aging in place for the purposes of this study. Although overall age between the ranges of 65 to 74 and 75 to 84 were found to be significant, the age range of 85 to 95 was not found to be significant ($p = 0.255$). This shows that age is predictive of aging in place, but there was no significant comparison of the specific age groups used in this study. I found marital status to be significant and a predictor of aging in place ($p = 0.011$). The marital status categories had higher odds of difficulty in aging in place except for those individuals who were married.

I found age to be a significant predictor of aging in place, which supports the findings of Won et al. (2016) that indicated that people 65 and older are expected to increase to an estimated population of 132 million by 2030 worldwide. I also found that marital status was a significant predictor of aging in place ($p = 0.011$). This finding supports those of other studies in the literature that have shown that individuals who are married have higher odds of aging in place (see Yang & Moorman, 2021). The results showed that there was no association between educational level and depression with aging in place; however, Park et al. (2018) found that older people with low economic status have higher levels of depression and mental disorders, which may increase as they age. I also found no association between employment status and aging in place. Race was also not associated with aging in place in RQ3. However, Ward et al. (2018) reported that Latino older adults experience an increased rate of depression and adverse mental health

due to living in neighborhoods where only Spanish is spoken and being cut off from society compared to English-only neighborhoods. Heart attack and stroke were also shown not to be associated with aging in place in the current study, although Fraile-Bermúdez et al. (2017) found that the lack of physical activity and an unhealthy diet in older adults led to adverse cardiovascular chronic illness. Related to the theoretical framework of the SEM, I conclude that community support services and public health policies that focus on the needs of people 65 and older are needed. The variables age, marital status, educational level, depression, employment, race, and cardiovascular illness can link to more than one level in the SEM, and interpersonal relationships, their environment, and policy level changes that support these above variables could lead to successful aging in place for people looking to stay in their homes as they age.

Limitations to the Study

One of the limitations of this study was related to the use of a secondary data set and self-reported responses (see Yang & Moorman, 2021). I had to use the data collected by other researchers for other purposes to answer my specific research questions in this study. Since the concept of aging in place is new, there is little peer-reviewed, longitudinal literature focusing on the effects of aging in place on adults 65 years of age and older. Therefore, without peer-reviewed longitudinal research, it was difficult to establish causal connections between adverse neighborhood factors and physical and mental health. For instance, the data set did not include a high sample rate for African Americans and Hispanics in Waves 1 and 2 (see Waite et al., 2019). Only African

American and Hispanic respondents who participated in Wave 3 of the data collection were sampled at a higher rate.

The data set itself presented some added limitations that I did not anticipate before conducting the study. The first limitation related to the data set was the observational research design. Observational research designs have a lower standard of evidence and are more prone to bias, making it difficult to determine cause and effect (Rezigalla, 2020). Another limitation of the study was the recoding the variable aging in place (i.e., time lived in an area) from eight into two categories to meet the binomial logistic regression assumption of a dichotomous dependent variable. I also transformed age (originally captured as 57 to 95 years in the NSHAP) into the three categories of 65 to 74, 75 to 84, and 85 to 95 to examine the shifts in the adverse neighborhood factors, chronic cardiovascular illness, and mental health factors.

The last limitation of the study was the frequency of some of the respondent categories. The variable for age included a category for those aged 85 to 95 years old, but in the sample used for the study, only 13.1% of the study sample fit this age category. The frequency in the race variable was another limitation. Only 16.5% of the sample was Black/African American, and only 10.4% were Asian, Pacific Islander, American Indian, or Alaska Native. As a result, these low percentages of racial samples may have affected the significance of the model.

Recommendations and Implications for Professional Practice and Social Change

Recommendations for Future Studies

Further research should be conducted to determine why people 65 and older find it difficult to age in place. This study was only meant to be a foundational level study to examine the impacts of adverse neighborhood factors, cardiovascular illness, and mental health on aging in place. Future researchers could collect data to address neighborhood factors in a particular area specific to the needs of people 65 and older. I would also recommend focusing on the variables found to be significant in this study, such as age, sex, marital status, and educational level. Determining what adverse neighborhood factors, health outcomes, mental health factors, and sociodemographic variables impact aging in place could have sizeable social change implications.

Based on the results of this study, I developed recommendations for the field of public health practice. The first practice level recommendation is that more time should be spent on getting individuals higher levels of education. Individuals with a vocational certificate/some college/associate degree were predicted to successfully age in place more often than those with less than a high school education. Elementary and high schools should promote opportunities for higher education. The second recommendation involves the findings that being married predicted more successful aging in place than those who were separated. Therefore, I recommend that community support for establishing social connections be provided for people 65 and older for those looking to age in place.

Developing policies that focus on the needs of people 65 and older is the most significant recommendation I have regarding public health policy. The theoretical

implications of the results of the current study are at the policy level of the SEM. In this study, I have shown that aging in place is a complex phenomenon that needs to be addressed through policy changes. Policy changes in public health that specifically include the needs of people 65 and older, advocacy in ensuring support services, and senior programs that promote healthy living for older adults can make a substantial positive social change in aging in place in the United States. Public health professionals should complete specialized training on socioeconomic factors that help people 65 and older successfully aging in place. This study showed those factors to be sex, age, marital status, and educational level. Training on how these factors can significantly predict aging in place is needed to increase awareness of public health interventions that focus on the specific needs of people 65 and older.

The results of this study have several implications for positive social change. As noted in the literature review, promoting safe neighborhoods, healthy connections, and policy change can ensure independence and the prevention of institutionalization for people 65 and older, which could create positive social change. More research on what socio-ecological individual, intrapersonal, organizational, community, and policy levels issues allow or disallow a person 65 and older to successfully age in place would help society. Another positive social change implication of this study is that the more support people 65 and older have at each level of the SEM to be able to age in place would reduce their mortality and morbidity rates. I found that sex, age, marital status, and educational level significantly predict aging in place. Policy changes that focus on support services, community outreach, and funding for people 65 and older to age in

place could be very beneficial to aging in place for people 65 and older. Based on the results of this study, a focus on males, people 65 and older, who are separated and have less than a high school education is needed to ensure older people stay in their homes as they age, which would lead to positive social change among this population.

Conclusion

With this quantitative study of secondary data, I examined the relationship between several variables, including neighborhood factors, cardiovascular chronic illness, mental health, and socioeconomic factors. I found that sex, age, marital status, and educational level were the only factors to predict aging in place. Looking at the factors for this study, most of the variables, such as trust, safety (i.e., afraid at night), shared values, heart attack, stroke, feelings of depression, race, and employment status, did not predict aging in place. However, the results of this study show that there is a need to conduct further research to determine why people 65 and older are having difficulty aging in place so that older people can be supported to live independently and avoid institutionalization. In this study, I formed the groundwork for other studies to look at other factors that explain who is more likely to successfully age in place. It is essential to have support services for people 65 and older, which is a focus of the United States health policy that promotes aging in place. This can be accomplished by creating policy-level changes (advocacy and senior programs) and community support services (public health interventions and public health programs) for people 65 and older.

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