LONG-TERM CARE IN THE UNITED STATES: EXAMINING THE ROLE OF SOCIOECONOMIC STATUS

by

Lori L. Eberly

A dissertation submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in
Health Services Research

Charlotte

2024

Approved by:

____

Dr. Michael E. Thompson

____

Dr. Sarah Laditka

____

Dr. Redwan Bin Abdul Baten

____

Dr. Jeffrey Shears

ABSTRACT

LORI L. EBERLY. Long-Term Care in the United States: Examining the Role of Socioeconomic Status. (Under the direction of DR. MICHAEL THOMPSON)

Access to long-term services and support (LTSS) is a public policy concern fueled by the aging of the population, the rising cost of formal care, and a declining pool of informal caregivers. In the United States, Medicaid is the largest payer of LTSS. Those not eligible for Medicaid and without financial resources to cover the out-of-pocket expenses rely on informal care networks or go without adequate care. This dissertation includes three manuscripts exploring the association between socioeconomic status and the interrelated topics of informal versus formal care use, unmet care needs, and concordance between preferred care and actual care used. Each study involved a cross-sectional analysis using National Health and Aging Trends Study (NHATS) data. Guided by Andersen and Newman's behavioral model of health, each study examined the relationship between socioeconomic status and the outcome of interest, controlling for predisposing, enabling, and need factors associated with LTSS utilization. Descriptive analysis was used to characterize the sample; bivariate analysis examined the relationship between SES and the outcome of interest and associations between the control variables. Logistic regression models with backward stepwise elimination iteratively removed all control variables with a p-value greater than 0.10. The results of each study were interpreted using adjusted odds ratios (AOR) and their corresponding 95% confidence intervals (CI).

The first study found that middle and upper-SES groups had decreased odds of using informal care. Other factors associated with decreased odds of informal care included being single, having higher levels of education, having insurance coverage, having a greater number of chronic illnesses, and having a greater number of needs related to activities of daily living (ADL) and instrumental activities of daily living (IADL) deficits. Conversely, women and those with children had increased odds of using informal care. Compared to the low-SES group, those in the middle-SES group had decreased odds of informal care but increased odds compared to the upper-SES group. The second study found that those in the middle-SES group had greater odds of unmet care needs (UCN). Other factors associated with increased odds of UCN included IADL and ADL dependencies, being single, and having children, while increased age and having only one or two chronic illnesses were inversely associated with UCN. The third study found that those in the middle and upper-SES groups had decreased odds of concordance between preferred care and care used compared to the low-SES group. Other factors significantly associated with decreased odds of concordance were age (75-84 years), education (high school or 2-4 years of college), and having insurance to assist with long-term care. No factors were associated with increased concordance. Compared to the low-SES group, those in the middle-SES group had decreased odds of concordance but increased odds compared to the upper-SES group. When individually comparing the middle-SES group to the low-SES and upper-SES groups, distinctly different patterns of association emerged.

Collectively, these three studies contribute to a gap in the existing U.S.-based research by examining the relationship between SES and various aspects of LTSS utilization, with a particular focus on the middle-class demographic. The variability of associations from one study to the next reflects the complexity of the LTSS decision-making processes, which challenges providers and policymakers to consider the intricate interplay of variables that influence LTSS decisions and outcomes. My findings establish an exploratory foundation for further research on a segment of older adults currently under-represented in long-term care research.

ACKNOWLEDGEMENTS

I thank my dissertation chair, mentor, and advisor, Dr. Michael Thompson, for his guidance and direction. His directness and process-driven approach were what I needed, even when I didn’t like it. I would also like to thank Dr. Sarah Laditka for contributing her wealth of knowledge related to a topic that means so much to me. Having a committee member with similar research interests was a tremendous asset and pushed me to make each chapter stronger. Lastly, I thank Dr. Bin Abdul Baten for helping me with some challenging methodological and coding issues. I am appreciative of each of my committee members for their direction and insight in the development of my research questions, for suggesting related literature, for assisting with methodological approaches, and for pushing me to think critically about my interpretation and implications. Their thorough review and recommendations made the finished project much stronger than the initial draft, and their support and mentorship have made me much more confident than I was when I started this journey. I cannot thank them enough for being incredibly timely and responsive throughout this process.

I would also like to acknowledge my fellow HSR classmate Kristin Lenoir for getting me through the past few years. Her data-driven mind helped me through many challenging courses, and her support helped me through this program.

I would also like to thank the team at NHATS for creating an immensely valuable publicly available dataset that provides the data necessary to learn more about the needs of our aging population.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

ADL	Activities of Daily Living
CI	Confidence Interval
HCBS	Home and Community Based Services
IADL	Instrumental Activities of Daily Living
LTC	Long Term Care
LTSS	Long Term Services and Supports
NHAT	National Health and Aging Trends Study
OR	Odds Ratio
UAR	Unadjusted Odds Ratio
UCN	Unmet Care Needs

CHAPTER 1: INTRODUCTION

Functional deficits related to frailty, cognitive decline, and multiple chronic conditions contribute to more than half of all older adults needing assistance with their activities of daily living (ADLs) and relying on a variety of long-term services and support (LTSS), both formal and informal (Johnson et al., 2021). LTSS encompasses various services that enable people to live independently by assisting with ADLs. These include home and community-based services (HCBS), which are services provided at home or in the community, or institutional care, which refers to care provided in a facility such as an assisted living or skilled nursing center. LTSS can be provided formally (paid) and informally (unpaid). While academic and government sectors refer to these services as LTSS, in the private industry, these services are more commonly known as long-term care (LTC).

Numerous studies have examined sociodemographic differences in LTSS use, such as the role of race and ethnicity (Angel & Angel, 2006; Fabius et al., 2021; Lin & Liu, 2023; Mutchler et al., 2021; Wallace et al., 1998), the role of gender (Chen et al., 2021; Fabius et al., 2021; Hooyman, 2014; Lin & Liu, 2023; Mutchler & Bullers, 1994; Steinbeisser et al., 2021), and even the role of family structure and living arrangement (Choi et al., 2021; Henning-Smith & Shippee, 2015). However, limited research examines the relationship between socioeconomic status (SES) and LTSS in the United States.

Review of the Literature

Socioeconomic Status

Socioeconomic Status (SES) impacts healthcare access and health-related outcomes for older adults (Fitzpatrick et al., 2004; McMaughan et al., 2020). Disparities in access contribute to unmet needs and delayed care (Yamada et al., 2015), contributing to adverse outcomes (Jenkins Morales & Robert, 2022). Wealthier older adults have better access to care and better health outcomes, while low-income older adults have limited access to care and poorer health outcomes (McMaughan et al., 2020). Prior research has addressed how SES impacts overall access to healthcare (Fitzpatrick et al., 2004; McMaughan et al., 2020; Yamada et al., 2015), but less is known about access to LTSS. Furthermore, even less is known about access to LTSS for the middle class. Middle-income earners represent the largest segment of the population over age 65 (Administration for Community Living, 2021), yet little has been done to examine the challenges they face in accessing LTSS, the prevalence of unmet care needs (UCN) among this demographic, or factors that influence autonomy in care decisions.

Income Inequality Among Older Adults

Over the past fifty years, adults ages 65 and older have been the only age group to experience a decrease in the low-income share of the population and an increase in the middle-income share (Kochhar & Sechopoulos, 2022). The same report shows that the proportion of low-income adults aged 65 and older has fallen from 54% in 1971 to 37% in 2021, while the middle-income tier aged 65 and older has increased from 39% to 47%. The upper-income tier increased from 7% to 16% during this period. This shift is likely attributable to gains in educational attainment. According to the Federal Interagency Forum on Aging-Related Statistics (2020), 86% of older adults were high school graduates, and 29% had a bachelor's degree or higher in 2018, compared to 24% and 5%, respectively, in 1965. Income inequality among older adults has continued to increase over time, greater among those age 65 and older relative to other age groups (Kochhar & Sechopoulos, 2022). Given that the primary coverage for long-term care in the U.S. is Medicaid, this late-life inequality presents unique challenges in meeting the care needs of the aging population.

Middle-income earners represent the largest segment of the population over age 65 (Kochhar & Sechopoulos, 2022), yet little has been done to examine the challenges they face in accessing LTSS or to assess the impact of SES on autonomy in LTSS decision-making. By 2029, two-thirds of middle-income earning older adults will have more than three chronic health conditions; more than half will have limited mobility; and one-fifth will have significant functional limitations (West & Dubay, 2019). The majority of these individuals will need some type of LTSS, and more than half will be unable to afford the care that they need (West & Dubay, 2019). In a unique study of what has been called the "The Forgotten Middle," researchers examined attributes of middle-class older adults aged 75 and older and their ability to afford residential senior housing, focusing on independent and assisted living care, which are primarily private pay options (Pearson et al., 2019). Their research was based on the premise that the residential housing industry is not focused on the needs of the middle class, and those needs will increase as the proportion of middle-class older adults increases, primarily in the cohort of 75 to 84-year-olds. These researchers suggest that less than 20% of middle-income seniors will have the financial resources to afford private-pay options, leaving those without an informal support network facing barriers in access to care.

Access to LTSS

Medicaid, a public insurance program for low-income earners, is the largest payor of formal LTSS expenditures in the U.S at 52%. (Congressional Research Service, 2023; Werner & Konetzka, 2022). The remainder of the expenditures are spread across various government programs such as the Older Americans Act and the Veterans Administration (15%), private long-term care insurance (9%), and out-of-pocket payments or private payments (24%) (Horstman et al., 2023). Approximately 40% of adults aged 50 and older are under the assumption that Medicare covers long-term care costs, while another 18% think private health insurance will cover long-term care costs (Hamel & Montero, 2023). In reality, both only cover short-term, medically necessary services under certain criteria. Misconceptions related to how long-term care is paid for contributes to lack of financial planning for future care needs. Less than half of adults aged 50 and older report taking steps to plan for care needs in their later years (Hamel & Montero, 2023).

A research brief by the Department of Health and Human Services Office of the Assistant Secretary for Planning and Evaluation (2019) noted that low-income older adults face limited LTSS options driven by Medicaid coverage; middle-income earning older adults risk being unable to afford LTSS services if needed; and wealthy older adults risk depleting their financial resources to pay for LTSS. According to the annual Genworth Cost of Care Survey (2021), the median cost of LTSS ranges from $54,000 to over $100,000 annually, depending upon the type of care used (i.e., paid care at home, assisted living, or skilled nursing).

In the 1960s, at the inception of Medicaid, the older population had a higher proportion of people living in poverty than any other age group (U.S Census Bureau, 1968). Today, the older population has a lower proportion of people living in poverty than any other age group (U.S Census Bureau,2020), yet Medicaid remains the default payer of long-term care services. As the proportion of low-income seniors decreases and the proportion of middle-income seniors increases, understanding SES differences in the type of care used, the presence of unmet needs, and concordance between the type of care preferred and the type of care used can be beneficial for policymakers who aim to understand the LTSS needs of our aging population and how to best allocate resources to meet those needs.

With financial resources impacting access to LTC, informal care by family and friends is an essential part of the LTSS spectrum. It has long been the primary source of care for older adults (U.S. Department of Health and Human Services, 2020). With the pool of informal caregivers declining due to reduced fertility rates, lower marriage rates, higher divorce rates, and greater geographic mobility among family units, dependency on formal care is expected to increase (Roth et al., 2015). This shift will likely exacerbate the challenges faced by those with limited financial resources who do not qualify for Medicaid. As the population ages, the U.S. must consider ways to modernize how LTSS are delivered and supported socially and financially and promote awareness of individual accountability in preparing for future care needs.

Care Use, Unmet Care Needs, and Care Preferences

Long-term care in the United States is complex and fragmented. Equitable access to care has been a public policy concern for decades (American Public Health Association, 2020). Solutions are challenging due to the interplay of numerous factors that influence access. In the absence of universal coverage of LTSS, it is important to understand utilization patterns and barriers to preferred or needed care options to reduce the adverse consequences associated with unmet care needs. As policymakers grapple with the aging of the population and the evolving needs of older adults, understanding the dynamics that impact formal and informal care use, unmet care needs, and autonomy in receiving the care that one prefers are critical. Furthermore, it is helpful to understand the consequences associated with each of these.

Informal and formal care are the two primary pillars of LTSS. Informal care is unpaid care, primarily provided by family and friends. Formal care is paid care provided in the home or a care setting, such as assisted living and skilled nursing facilities. Many factors, including cultural norms, family dynamics, accessibility, and affordability, influence the choice between informal and formal care (Abrahamson et al., 2017; Eckert et al., 2004; Kasper et al., 2019; Kemper, 1992; Mommaerts, 2018; Van Houtven & Norton, 2004; Zarzycki et al., 2023). The type of care used impacts the fulfillment of care needs. As care needs increase, informal caregivers often struggle to adequately provide the level of care needed (Schulz & Tompkins, 2010), which can result in UCN. Accessibility and affordability of formal care can also contribute to UCN. If formal support is needed, those with limited financial resources who are not eligible for Medicaid may find it difficult to afford the services they need (Harris-Kojetin et al., 2019; Pearson et al., 2019).

Unmet care needs emerge as a pivotal concern within this context, reflecting situations where the care provided does not adequately address the needs of individuals. Over 40% of older adults report needing more assistance than they receive (Jenkins Morales & Robert, 2022). UCN can contribute to adverse outcomes, such as falls, medication errors, hospitalizations, nursing home admission, and even premature death (Allen et al., 2014; Casado et al., 2011; Jenkins Morales & Robert, 2022); all of which can contribute to higher healthcare costs. More than 30% of older adults needing assistance with ADLs and IADLs have had at least one adverse consequence related to UCN (Freedman & Spillman, 2014). The presence of UCN is closely linked to the broader care system's capacity to offer comprehensive, accessible, and affordable LTSS solutions.

The concordance between preferred care and care used sheds light on how the current care system supports individual autonomy in care decisions, whether it promotes care that aligns with preferences versus forced by circumstances. Discordance in care preferences may arise due to financial constraints, limited availability of preferred care options, or a lack of awareness about available services. Such discrepancies highlight the challenges in achieving person-centered care, underscoring the importance of aligning LTSS with the values, needs, and desires of older adults and their families.

My research explores the interrelations among these three dimensions, exploring how the interplay between formal and informal care, unmet care needs, and concordance is influenced by socioeconomic status. By examining these relationships, my research aims to discover the factors that impact access to LTSS and provide a foundation for future research supporting equitable access to care.

Theoretical Framework

The Andersen healthcare utilization model (Andersen & Newman, 1973) provides a framework for categorizing factors associated with care use as predisposing, enabling, or need-based. Predisposing factors include attitudes, knowledge, social norms, and perceived control over the situation. Enabling factors impact the ability to access needed care, such as support from friends and family, affordability, availability, or prior knowledge and experience. Need can be a function of the individual's perception or the perception of others as to what the actual care needs are. This model is commonly used in long-term care research to examine factors associated with various patterns of long-term care use (Borrayo et al., 2002; Casado et al., 2011; Fu et al., 2017; Wallace et al., 1998).

Guided by this model, my research aimed to understand if SES is a barrier in accessing LTSS. I examined whether differences exist in relation to the type of care used, unmet care needs, and the concordance between care preferences and care used. Predisposing variables included race, age, gender, and education. Enabling variables were marital status, number of children, and private or public insurance coverage. Need variables included measures of IADL and ADL need, chronic conditions, and cognitive impairment.

Predisposing Factors

Age is a primary determinant in the need for and type of LTSS used (U.S. Department of Health and Human Services, 2021). Increased age is associated with increased reliance on formal care (Portrait et al., 2000). Adults aged 65-74 are more likely to have unmet care needs than their older counterparts (Beach & Schulz, 2017; Freedman & Spillman, 2014). Those aged 85 and older are more likely to use care that matches their preferences than persons ages 65–74 (Kasper et al., 2019). Racial and ethnic differences also influence LTSS use. Minority populations, particularly Blacks and non-White Hispanics, are more likely to rely on informal care than formal care (Angel & Angel, 2006; Kemper, 1992), are more likely to have unmet care needs (Lima & Allen, 2001; Lin & Liu, 2023), and are less likely to use care that aligns with their preferences (Kasper et al., 2019). Gender is another critical factor affecting long-term care utilization. Women are more likely than men to use LTSS due to longer life expectancy (U.S. Department of Health and Human Services, 2019), more likely use paid care (Hooyman, 2014; Mutchler & Bullers, 1994; Steinbeisser et al., 2021), more likely to prefer paid care (Henning-Smith et al., 2021), and more likely to have unmet care needs (Chen et al., 2021; LaPlante et al., 2004; Lin & Liu, 2023). Regarding education, those with higher levels of educational attainment have an increased propensity toward formal care options (Lera et al., 2020; Wee et al., 2014; Wrotek & Kalbarczyk, 2023; Zhao et al., 2022) and those with lower educational levels have a greater risk of UCN (Albuquerque, 2022; Calderón-Jaramillo & Zueras, 2023), and are less likely to use care that aligns with their preferences (Kasper et al., 2019).

Enabling Factors

Marital status and family structure are key factors in determining LTSS utilization. Single individuals and those without children are more likely to rely on formal care (Steinbeisser et al., 2021; U.S. Department of Health and Human Services, 2020) and are more likely to have unmet care needs (Beach & Schulz, 2017; Forden & Ghilarducci, 2023). Married individuals are more likely than single individuals to use care that matches their preferences (Kasper et al., 2019).

Higher-income has been associated with a greater likelihood of using formal care over informal care (Kemper, 1992; Wee et al., 2014) and a lower probability of UCN (Albuquerque, 2022). Having public or private insurance to assist with long-term care costs has been associated with increased formal care utilization, but those with private insurance are more likely to report under-met needs than those with public insurance (U.S. Department of Health and Human Services, 2000).

Need Factors

Research consistently finds that need factors are the strongest predictors of LTSS use (Wrotek & Kalbarczyk, 2023). Those with higher levels of disability or cognitive impairment are more likely to use formal care than informal care (Pinquart & Sörensen, 2002; Steinbeisser et al., 2021; Wolff et al., 2008; Wrotek & Kalbarczyk, 2023) and more likely to have unmet care needs (Beach & Schulz, 2017; Fabius et al., 2021; Nieuwenhuis et al., 2018). As care needs increase, preferences shift from informal care at home towards facility-based care (Lehnert et al., 2019), but little is known about the relationship between need and the concordance between preference and care used.

This culmination of prior research related to predisposing, enabling, and need-based factors guided the selection of control variables for my studies.

Dissertation Research

My research included three interrelated studies examining the relationship between SES and patterns of LTSS use. These patterns included variations in informal versus formal care utilization, unmet care needs, and concordance between care preferences and care used. This exploratory research aimed to uncover differences by SES and whether those in the middle-SES group are more likely to use informal care; have unmet care needs, and are less likely to utilize care concordant with their preferred care type. Each study and research question are listed below.

Study 1**:** This study explored the relationship between SES and formal and informal care utilization among older adults.

Q1: How do the types of LTSS used, categorized as formal and informal, vary across the SES classes?

Q2: Do individuals in the middle-income SES have a greater propensity towards utilizing informal care compared to their counterparts?

The target journal for this study is The Journal of Family and Economic Issues (JFEI). My exploration of how SES influences decisions regarding informal care and formal care use aligns with the journal's aim to understand the economic factors that impact family dynamics and well-being. *Alternate*: Research on Aging

Study 2**:** This study explored the relationship between SES and older adults' unmet care needs (UCN).

Q1: How does unmet care need differ by socioeconomic status?

Q2: Are those in the middle class more likely to experience unmet care needs?

The target journal for this study is The Journals of Gerontology: Series B. My exploration of UCN aligns with prior studies of UCN published in this journal and offers a new perspective from the lens of SES. *Alternate:* Journal of Aging and Health.

Study 3**:** This study explored the relationship between SES and the concordance between preferred and utilized LTSS among older adults.

Q1: How does concordance between preferred and utilized LTSS vary by SES?

Q2: Are those in the middle class less likely to use care concordant with their preference?

The target journal for this study is the Journal of Aging and Health. My focus on concordance between preference and use aligns with this journal's focus on satisfaction and quality of life for older adults. *Alternate:* Journal of Aging and Social Policy.

Data Sources

Each study used data from the 2019 National Health and Aging Trends Study (NHATS). Study 3 also used data from the 2018 National Health and Aging Trends Study (NHATS). Due to the impact the COVID-19 pandemic had on long-term care utilization patterns in 2020 and 2021 (Werner & Bressman, 2021), I selected the most recent pre-pandemic rounds of data for these studies. NHATS uses a nationally representative sample of Medicare beneficiaries ages 65 and older, collecting detailed information on health, functioning, and living environment, in addition to demographic and other contextual data. Since 2011, NHATS has conducted annual in-person interviews of individuals living at home and in institutional care communities, such as assisted living and nursing homes. NHATS collects information across multiple domains, including cognitive and physical capacity and function, social support networks, and economic status (Kasper & Freedman, 2020). Additional information on the NHATS sampling design and methods can be found elsewhere (Kasper & Freedman, 2020). All data used in my research is de-identified public-use data. See Appendix A for confirmation from the Office of Research Protections and Integrity affirming that this research did not use individually identifiable data nor could I readily ascertain the identity of any study participants.

Operationalizing Variables

Independent Variable

For each study, the independent variable of interest was SES represented as a categorical variable with classifications of low, middle, and upper. Operational definitions of SES can vary across studies and across populations, as can the classification of low, middle, and upper-class status or position. While no uniform measure of SES exists, the American Psychological Association (2007) describes SES as a social class determined by education, income, and occupation. Measures of SES often depend on the study design and the data available (Grundy & Holt, 2001). Including education, income, and occupation is often not necessary when constructing a measure of SES in later life (Darin-Mattsson et al., 2017; Robert & House, 1996)

NHATS respondents report total household income, including Social Security, Supplemental Security Income, Veterans Administration payments, pensions, retirement funds, and investment income (DeMatteis et al., 2020). To account for those who do not report income or reported income by bracket only, NHATS provides imputed income values (DeMatteis et al., 2020). In the 2019 round, 69% of the sample reported total income, while 18% reported an income bracket (DeMatteis et al., 2020). NHATS created a bracketed income value for 87% of the sample and required imputation for 13% (DeMatteis et al., 2020). Given the NHATS expansive approach to income data collection, this study employs a simplified measurement of SES based on total household income.

Two common methods for defining income classes are: 1) the percentile-based approach, in which the sample is grouped into quintiles with the bottom 20% classified as low-income, the middle 60% classified as middle-income, and the top 20% classified as upper-income; and 2) multiples of the median national household income, in which households earning less than two-thirds of median are classified as low-income, two-thirds to double the median are classified at middle-income, and more than double the median is classified as upper-income (Pressman, 2015; Tyson et al., 2021). For my analysis, I used the latter approach and the 2019 median national household income of $68,703 (U.S. Census Bureau, 2020). The 2019 median national household income for those over age 65 was just slightly higher at $70,254 (Administration for Community Living, 2021). Additional context defining and measuring the middle class can be found elsewhere (Elwell, 2014; Kochhar & Sechopoulos, 2022; Pressman, 2015; Tyson et al., 2021). This approach resulted in SES classifications of <$45,803 (low), $45,803-$137,407 (middle), and >$137,407 (upper). I also conducted a sensitivity analysis in each study using income classifications of <$28,000 (low), $28,001-$80,000 (middle), and >$80,000 (upper) in the regression models to align with the percentile methodology.

Dependent Variables

For the first study, the outcome variable of interest was the type of care used, represented dichotomously as formal or informal. Formal care encompasses paid in-home care, assisted living, or skilled nursing. Informal care encompasses care provided by family and friends, primarily at home or in the home of family and friends.

For the second study, the dependent variable of interest is the self-reported occurrence of UCN, measured dichotomously (y/n) in response to whether the participant went without assistance performing any ADLs (bathing, dressing, toileting, mobility, and eating) or IADLs (laundry, shopping, meal preparation, and medication management) in the past 30 days.

For the third study, the outcome of interest was whether care preference matched the care used, represented dichotomously as concordant or discordant. Concordance was measured by matching hypothetical care preferences identified in a previous round of NHATS (2018) with care used in the current round (2019). Categories of care included unpaid home care, paid home care, assisted living, and skilled nursing. NHATS only ascertained care preference responses in

2012 and 2018. Using 2018 responses allowed for a much larger sample size due to attrition of respondents from the 2012 round.

Control Variables

Each study employs the same predisposing, enabling, and need variables as control variables. Predisposing variables included age, gender, race/ethnicity, and educational attainment. Each variable was represented categorically with three age groups (65-74; 75-84; 85 or older); two gender groups (men and women); three race groups (white non-Hispanic; Black non-Hispanic; Hispanic/Other); and four education groups (< high school diploma; high school diploma; 2-4 years of college; > bachelor's degree). Enabling variables included marital status (married/living together; or single/divorced/widowed); children (yes/no); and long-term care coverage, including Medicaid, Veterans' Benefits, LTC insurance, or non-government programs (yes/no). Need was represented by self-reported diagnosis of dementia (yes/no); number of chronic conditions: heart disease, high blood pressure, arthritis, stroke, diabetes, cancer, lung disease, and osteoporosis (0; 1-2; 3 or more); reported limitations related to IADLs of shopping, cooking, medication management, and laundry (0, 1-2; 3 or more); and reported limitations related to ADLs of bathing, dressing, feeding, mobility, and toileting (0, 1-2; 3 or more).

Analysis

Each study employed descriptive analysis to characterize the sample. Bivariate analysis with chi-squared tests was used to examine associations between the independent and dependent variable and the control variables. Logistic regression models with stepwise backward elimination were used to determine the most significant factors associated with the outcome of interest. This process involved iteratively removing variables from the logistic regression model based on their statistical significance, using a p-value threshold of 0.10. Results were interpreted using adjusted odds ratios (AOR) and a 95% confidence interval. This approach is a standard method in statistical analysis to refine models by focusing on the most influential predictors (Bursac et al., 2008; Dunkler et al., 2014). Analyses were conducted in Stata Version 18.0 (Stata Corp., College Station, TX).

Implications

Among older adults, the middle class is growing in size and proportion, yet they are underrepresented in research, and their needs are often not prioritized by policymakers or advocacy groups. To the best of my knowledge, these three studies are the first to explore the relationship between SES and variations in LTSS utilization, emphasizing potential disparities faced by those in the middle class. While previous research has used elements of SES as control variables, my research is the first to use SES as the primary variable of interest. Analysis of the role of SES in LTSS utilization fills a missing gap in understanding the needs of our aging population and how to delineate between the role of public assistance and individual accountability. My research aims to establish a foundation for further examination of socioeconomic differences in access to LTSS.

References

Abrahamson K., Hass Z., & Sands L., (2017). Likelihood that expectations of informal care will be met at onset of caregiving need: A retrospective study of older adults in the USA. *BMJ Open*, 7, e017791. doi: 10.1136/bmjopen-2017-017791

Administration for Community Living. (2021). 2020 Profile of Older Americans. U.S. Department of Health and Human Services. https://acl.gov/sites/default/files/Aging%20and%20Disability%20in%20America/2020ProfileOlderAmericans.Final_.pdf

Allen, S. M., Piette, E. R., & Mor, V. (2014). The adverse consequences of unmet need among older persons living in the community: dual-eligible versus Medicare-only beneficiaries. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 69 Suppl 1(Suppl 1), S51–S58. https://doi.org/10.1093/geronb/gbu124

Albuquerque, P. C. (2022). Met or unmet need for long-term care: Formal and informal care in southern Europe. *The Journal of the Economics of Ageing*, 23(C). DOI: 10.1016/j.jeoa.2022.100409

American Public Health Association. (2020.). *The Importance of Universal Health Care in Improving Our Nation's Response to Pandemics and Health Disparities*. APHA. https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2021/01/14/the-importance-of-universal-health-care-in-improving-response-to-pandemics-and-health-disparities

Andersen, R., & Newman, J. F. (1973). Societal and individual determinants of medical care utilization in the United States. *The Milbank Memorial Fund quarterly. Health and Society*, 51(1), 95–124. https://doi.org/10.2307/3349613

Angel, J. L., & Angel, R. J. (2006). Minority group status and healthful aging: social structure still matters. *American Journal of Public Health*, 96(7), 1152–1159. https://doi.org/10.2105/AJPH.2006.085530

American Psychological Association, Task Force on Socioeconomic Status. (2007). *Report of the APA Task Force on Socioeconomic Status*. Washington, DC: American Psychological Association.

Beach, S. R., & Schulz, R. (2017). Family caregiver factors associated with unmet needs for care of older adults. *Journal of the American Geriatrics Society*, 65(3), 560–566. https://doi.org/10.1111/jgs.14547

Borrayo, E. A., Salmon, J. R., Polivka, L., & Dunlop, B. D. (2002). Utilization across the continuum of long-term care services. *The Gerontologist*, *42*(5), 603–612. https://doi.org/10.1093/geront/42.5.603

Bursac, Z., Gauss, C., Williams, D., & Hosmer, D. (2008). Purposeful selection of variables in logistic regression. *Source Code for Biology and Medicine*, 3(1), 17. https://doi.org/10.1186/1751-0473-3-17

Calderón-Jaramillo, M., & Zueras, P. (2023). Cared and uncared populations: Understanding unmet care needs of older adults (65+) across different social care systems in Europe. *European Journal of Ageing*, 20(1), 11. https://doi.org/10.1007/s10433-023-00760-3

Casado, B. L., van Vulpen, K. S., & Davis, S. L. (2011). Unmet needs for home and community-based services among frail older Americans and their caregivers. *Journal of Aging and Health*, 23(3), 529–553. https://doi.org/10.1177/0898264310387132

Chen, N., Li, X., Deng, M., Wang, C. Q., & Zhou, C. (2021). Gender difference in unmet need for assistance with activities of daily living among disabled seniors in China: A cross-sectional study. *BMJ Open*, 11(6), e044807. https://doi.org/10.1136/bmjopen-2020-044807

Choi, H., Heisler, M., Norton, E. C., Langa, K. M., Cho, T. C., & Connell, C. M. (2021). Family Care Availability And Implications For Informal And Formal Care Used By Adults With Dementia In The US. *Health Affairs* (Project Hope), 40(9), 1359–1367. https://doi.org/10.1377/hlthaff.2021.00280

Congressional Research Service. (2023). Who Pays for Long-Term Services and Supports. https://crsreports.congress.gov/product/pdf/IF/IF10343

Darin-Mattsson, A., Fors, S., & Kåreholt, I. (2017). Different indicators of socioeconomic status and their relative importance as determinants of health in old age. *International Journal for Equity in Health*, 16. https://doi.org/10.1186/s12939-017-0670-3.

DeMatteis, J., Freedman V., Kasper, J., and Jiao, R. (2020). National Health and Aging Trends Study Round 9 Income Imputation. NHATS Technical Paper #27. Johns Hopkins University School of Public Health.

Dunkler, D., Plischke, M., Leffondré, K., & Heinze, G. (2014). Augmented backward elimination: A pragmatic and purposeful way to develop statistical models. *PloS One*, 9(11), e113677–e113677. https://doi.org/10.1371/journal.pone.0113677

Eckert, J. K., Morgan, L. A., & Swamy, N. (2004). Preferences for receipt of care among community-dwelling adults. *Journal of Aging & Social Policy*, 16(2), 49–65. https://doi.org/10.1300/J031v16n02_04

Elwell, C. (2014). The Distribution of Household Income and the Middle Class. Washington, DC: Congressional Research Service. https://fas.org/sgp/crs/misc/RS20811.pdf

Fabius, C. D., Parker, L. J., & Thorpe, R. J. (2021). The Influence of Race and Gender on Receiving Assistance With Daily Activities Among Older Americans. *Innovation in Aging*, 6(2), igab060. https://doi.org/10.1093/geroni/igab060

Federal Interagency Forum on Aging-Related Statistics. (2020). Older Americans 2020: Key indicators of well-being. Washington, DC: U.S. Government Printing Office.

Fitzpatrick, A. L., Powe, N. R., Cooper, L. S., Ives, D. G., & Robbins, J. A. (2004). Barriers to health care access among the elderly and who perceives them. *American Journal of Public Health*, 94(10), 1788–1794. https://doi.org/10.2105/ajph.94.10.1788

Forden, J., & Ghilarducci, T. (2023). U.S. Caregiving System Leaves Significant Unmet Needs Among Aging Adults. Economic Policy Research Institute. https://www.economicpolicyresearch.org/images/Retirement_Project/Policy_Notes/2023/December_Caregiving/Unmet_Care_Needs_Among_Aging_Adults.pdf

Freedman, V. A. and Spillman, B. C. (2014). Disability and care needs among older Americans. *Milbank Quarterly, 92: 509-541*. https://doi.org/10.1111/1468-0009.12076

Fu, Y. Y., Guo, Y., Bai, X., & Chui, E. W. (2017). Factors associated with older people's long-term care needs: A case study adopting the expanded version of the Anderson Model in China. *BMC Geriatrics*, 17(1), 38. https://doi.org/10.1186/s12877-017-0436-1

Genworth Financial. (2021). Genworth Cost of Care Survey. https://www.genworth.com/aging-and-you/finances/cost-of-care.html

Grundy, E., & Holt, G. (2001). The socioeconomic status of older adults: how should we measure it in studies of health inequalities? *Journal of Epidemiology and Community Health*, *55*(12), 895–904. https://doi.org/10.1136/jech.55.12.895

Hamel, L., & Montero, A. (2023, November 14). *The affordability of long-term care and support services: Findings from a KFF survey*. Kaiser Family Foundation. https://www.kff.org/health-costs/poll-finding/the-affordability-of-long-term-care-and-support-services/

Harris-Kojetin, L., Sengupta, M., Lendon, J. P., Rome, V., Valverde, R., & Caffrey, C. (2019). Long-term care providers and services users in the United States, 2015–2016. https://www.cdc.gov/nchs/nsltcp/index.htm

Henning-Smith, C. E., & Shippee, T. P. (2015). Expectations about future use of long-term services and supports vary by current living arrangement. *Health Affairs*, 34(1), 39–47. https://doi.org/10.1377/hlthaff.2014.0556

Henning-Smith, C., Mulcahy, J., Lahr, M., & Tanem, J. (2021). Preferences for long-term care arrangements among rural and urban older adults. *University of Minnesota Rural Health Research Center.* https://rhrc.umn.edu/wp-content/uploads/2021/09/UMN-Aging-in-Place-Policy-Brief_5.1.21_508.pdf

Hooyman, N. R. (2014). Social and health disparities in aging: Gender inequities in long-term care. Generations: *Journal of the American Society on Aging*, 38(4), 25–32. https://www.jstor.org/stable/26556073

Horstman, C., Gumas, E. D., & Jacobson, G. (2023). U.S. and Global Approaches to Financing Long-Term Care: Understanding the Patchwork. Commonwealth Fund. Retrieved from https://www.commonwealthfund.org/publications/issue-briefs/2023/feb/us-global-financing-long-term-care-patchwork

Jenkins Morales, M., & Robert, S. (2022). Examining consequences related to UCNs across the long-term care continuum. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences,* 77, Suppl 1, S63–S73. https://doi.org/10.1093/geronb/gbab210

Johnson, R. W., Favreault, M., Dey, J., Marton, W., & Anderson, L. (2021). Most Older Adults Are Likely to Need and Use Long-Term Services and Supports Issue Brief. Assistant Secretary for Planning and Evaluation. https://aspe.hhs.gov/reports/most-older-adults-are-likely-need-use-long-term-services-supports-issue-brief-0

Kasper, J., & Freedman, V. (2020). National Health and Aging Trends Study User Guide: Rounds 1-9 Final Release. Baltimore: Johns Hopkins University School of Public Health. https://nhats.org/sites/default/files/2021-04/NHATS_User_Guide_R9_Final_Release_0.pdf

Kasper, J., Wolff, J., & Skehan, M. (2019). Care arrangements of older adults: What they prefer, what they have, and implications for quality of life. *The Gerontologist*, 59(5), 845–855. https://doi.org/10.1093/geront/gny127

Kemper, P. (1992). The use of formal and informal home care by the disabled elderly. *Health Services Research*, 27(4), 421. https://link.gale.com/apps/doc/A13528540/AONE?u=char69915&sid=bookmark-AONE&xid=c3f7962e

Kochhar, R., & Sechopoulos, S. (2022). *How the American Middle Class has changed in the past five decades*. Pew Research Center. https://www.pewresearch.org/short-reads/2022/04/20/how-the-american-middle-class-has-changed-in-the-past-five-decades/#:~:text=The%20share%20of%20adults%20ages,from%207%25%20to%2016%25.

LaPlante, M. P., Kaye, H. S., Kang, T., & Harrington, C. (2004). Unmet need for personal assistance services: estimating the shortfall in hours of help and adverse consequences. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 59(2), S98–S108. https://doi.org/10.1093/geronb/59.2.s98

Lehnert, T., Heuchert, M., Hussain, K., & Konig, H. (2019). Stated preferences for long-term care: A literature review. *Ageing & Society*, 1–41. doi:10.1017/S0144686X18000314

Lera, J., Pascual-Sáez, M., & Cantarero-Prieto, D. (2020). Socioeconomic Inequality in the Use of Long-Term Care among European Older Adults: An Empirical Approach Using the SHARE Survey. *International Journal of Environmental Research and Public Health*, 18(1), 20-. https://doi.org/10.3390/ijerph18010020

Lima, J., & Allen, S. (2001). Targeting risk for unmet need: Not enough help versus no help at all. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 56(5), S302–S310. https://doi.org/10.1093/geronb/56.5.S302

Lin, Z., & Liu, H. (2023). Race/Ethnicity, Nativity, and Gender Disparities in Unmet Care Needs among Older Adults in the United States. *The Gerontologist*, gnad094. Advance online publication. https://doi.org/10.1093/geront/gnad094

McMaughan, D. J., Oloruntoba, O., & Smith, M. L. (2020). Socioeconomic Status and Access to Healthcare: Interrelated Drivers for Healthy Aging. *Frontiers in Public Health*, 8, 231. https://doi.org/10.3389/fpubh.2020.00231

Mommaerts, C. (2018). Are coresidence and nursing homes substitutes? Evidence from Medicaid spend-down provisions. *Journal of Health Economics*, 59, 125–138. https://doi.org/10.1016/j.jhealeco.2018.04.003

Mutchler, J., & Bullers, S. (1994). Gender Differences in Formal Care Use in Later Life. *Research on Aging*, 16(3), 235–250. https://doi.org/10.1177/0164027594163001

Mutchler, J., Velasco Roldán, N., & Li, Y. (2021). Late-life Gender Disparities in Economic Security in the Context of Geography, Race and Ethnicity, and Age: Evidence from the 2020 Elder Index. Center for Social and Demographic Research on Aging Publications, (52). https://scholarworks.umb.edu/demographyofaging/52

Nieuwenhuis, A. V., Beach, S. R., & Schulz, R. (2018). Care Recipient Concerns About Being a Burden and Unmet Needs for Care. *Innovation in Aging*, *2*(3), igy026. https://doi.org/10.1093/geroni/igy026

Pearson, C. F., Quinn, C. C., Loganathan, S., Datta, A. R., Mace, B. B., & Grabowski, D. C. (2019). The Forgotten Middle: Many middle-income seniors will have insufficient resources for housing and health care. *Health Affairs*, 38(5), 101377. https://doi.org/10.1377/hlthaff.2018.05233

Pinquart, M., & Sörensen, S. (2002). Psychological outcomes of preparation for future care needs. *Journal of Applied Gerontology*, 21(4), 452–470. https://doi.org/10.1177/073346402237632

Portrait, F., Lindeboom, M., & Deeg, D. (2000). The use of long-term care services by the Dutch elderly. *Health Economics,* 9(6), 513–531. https://doi.org/10.1002/1099-1050(200009)9:6<513::AID-HEC534>3.0.CO;2-R

Pressman, S. (2015). Defining and Measuring the Middle Class. American Institute of Economic Research. https://www.aier.org/wp-content/uploads/2016/10/WP007-Middle-Class.pdf

Robert, S., & House, J. S. (1996). SES Differentials in Health by Age and Alternative Indicators of SES. *Journal of Aging and Health*, *8*(3), 359-388. https://doi.org/10.1177/089826439600800304

Roth, D. L., Fredman, L., & Haley, W. E. (2015). Informal caregiving and its impact on health: A reappraisal from population-based studies. The Gerontologist, 55(2), 309–319. https://doi.org/10.1093/geront/gnu177

Schulz, R.& Tompkins,C. (2010). Informal Caregivers in the United States: Prevalence, Caregiver Characteristics, and Ability to Provide Care. The Role of Human Factors in Home Health Care: Workshop Summary. Washington (DC): National Academies Press. https://www.ncbi.nlm.nih.gov/books/NBK210048/

Steinbeisser, K., Schwarzkopf, L., Grill, E., Schwettmann, L., Peters, A., & Seidl, H. (2021). Gender-linked determinants for utilization of long-term care in community-dwelling adults 65+ in Germany: Results from the population-based KORA-Age study. *Experimental Gerontology*, 153, 111500–111500. https://doi.org/10.1016/j.exger.2021.111500

Tyson, A., Funk, C., Kennedy, B., & Johnson, C. (2021). Methodology. Pew Research Center Science & Society. https://www.pewresearch.org/science/2021/09/15/covid19-restrictions-methodology/

U.S. Census Bureau. (1968). Current Population Reports, Series P-20, No.54, “The Extent of Poverty in the United States: 1959 to 1966.” U.S. Government Planning Office, Washington, D.C.

U.S. Census Bureau. (2020). Income and Poverty in the United States: 2019. Census.Gov. https://www.census.gov/library/publications/2020/demo/p60-270.html

U.S. Department of Health and Human Services. (2000). Multivariate analysis of patterns in informal and formal caregiving among privately insured and non-privately insured populations. Office of the Assistant Secretary for Planning and Evaluation. https://aspe.hhs.gov/reports/multivariate-analysis-patterns-informal-formal-caregiving-among-privately-insured-non-privately-0

U.S. Department of Health and Human Services. (2019). What is the lifetime risk of needing and receiving long-term services and supports? Office of the Assistant Secretary for Planning and Evaluation.https://aspe.hhs.gov/reports/what-lifetime-risk-needing-receiving-long-term-services-supports-0

U.S. Department of Health and Human Services. (2020). Informal Caregiver Supply and Demographic Changes. Office of the Assistant Secretary for Planning and Evaluation. https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//198051/ICSupplyLR.pdf

U.S. Department of Health and Human Services. (2021).Projections of Needing Long-Term Services and Supports at Ages 65 and Older. https://aspe.hhs.gov/sites/default/files/private/pdf/265136/LTSSRisk.pdf

Van Houtven, C. H., & Norton, E. C. (2004). Informal care and health care use of older adults. *Journal of Health Economics*, 23(6), 1159-1180. https://doi.org/10.1016/j.jhealeco.2004.04.008

Wallace, S. P., Levy-Storms, L., Kington, R. S., & Andersen, R. M. (1998). The Persistence of Race and Ethnicity in the use of LTC. The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences, 53B(2), S104–S112. https://doi.org/10.1093/geronb/53B.2.S104

Wee, S.-L., Liu, C., Goh, S.-N., Chong, W. F., Aravindhan, A., & Chan, A. (2014). Determinants of Use of Community-Based Long-Term Care Services. *Journal of the American Geriatrics Society,* 62(9), 1801–1803. https://doi.org/10.1111/jgs.13003

Werner, R. M., & Bressman, E. (2021). Trends in Post-Acute Care Utilization During the COVID-19 Pandemic. *Journal of the American Medical Directors Association*, *22*(12), 2496–2499. https://doi.org/10.1016/j.jamda.2021.09.001

Werner, R. M., & Konetzka, R. T. (2022). Reimagining Financing and Payment of Long-Term Care. *Journal of the American Medical Directors Association*, *23*(2), 220–224. https://doi.org/10.1016/j.jamda.2021.11.030

West, J., & Dubay, L. (2019). Middle-income seniors face a gap in housing and health supports. Urban Institute. https://www.urban.org/urban-wire/middle-income-seniors-face-gap-housing-and-health-supports

Wolff, J. L., Kasper, J. D., & Shore, A. D. (2008). Long-term care preferences among older adults: A moving target? *Journal of Aging & Social Policy*, 20(2), 182–200. https://doi.org/10.1080/08959420801977574

Wrotek, M., & Kalbarczyk, M. (2023). Predictors of long-term care use - informal home care recipients versus private and public facilities residents in Poland. *BMC Geriatrics*, 23, 512. https://doi.org/10.1186/s12877-023-04216-2

Yamada, T., Chen, C. C., Murata, C., Hirai, H., Ojima, T., Kondo, K., & Harris, J. R., 3rd (2015). Access disparity and health inequality of the elderly: unmet needs and delayed healthcare. *International Journal of Environmental Research and Public Health*, 12(2), 1745–1772. https://doi.org/10.3390/ijerph120201745

Zarzycki, M., Morrison, V., Bei, E., & Seddon, D. (2023). Cultural and societal motivations for being informal caregivers: A qualitative systematic review and meta-synthesis. *Health Psychology Review*, 17(2), 247–276. https://doi.org/10.1080/17437199.2022.2032259

Zhao, B., Kong, F., Shin, D. E., & Nam, E. W. (2022). Gender Disparity and the Association Between Socioeconomic Status, Mental Health, and the Need for Long-Term Services and Support Among the Older Koreans. *Frontiers in Public Health*, 10, 888011. https://doi.org/10.3389/fpubh.2022.888011

CHAPTER 2: EXPLORING SOCIOECONOMIC DIFFERENCES IN INFORMAL VERSUS FORMAL CARE UTILIZATION AMONG OLDER ADULTS

Abstract

Background: This study investigates the relationship between socioeconomic status (SES) and formal and informal care utilization among older adults. It aims to provide an exploratory examination addressing "How do the types of Long-Term Services and Supports (LTSS) used, categorized as formal and informal, vary across the SES classes?" and "Do individuals in the middle-income SES have a greater propensity towards utilizing informal care compared to their counterparts?". It contributes to the existing literature on LTSS utilization patterns but addresses a gap related to the role of SES.

Data and Methods: Utilizing cross-sectional data from the 2019 National Health and Aging Trends Study (NHATS) round, the study includes 3,789 individuals aged 65 and older who reported having formal or informal LTSS assistance. I examined the relationship between SES and the utilization of formal and informal long-term care services, controlling for predisposing, enabling, and need factors. Logistic regression models with backward elimination were used to determine significant factors associated with using informal care versus formal care.

Results: In the overall SES analysis, those in the middle and upper-SES groups had decreased odds of using informal care, as did being single, having higher levels of education, having insurance coverage, and having a greater number of chronic illnesses and ADL and IADL deficits. Conversely, women and those with children had increased odds of using informal care. The findings prevailed in the model comparing the middle-SES group to the lower-SES group; however, comparing the middle-SES group to the upper-SES group showed increased odds of using informal care among the middle-SES group, those aged 75-84, and Blacks. Those who are single, more educated, and those with three or more chronic illnesses and three or more ADL and IADL needs had lower odds of using informal care.

Discussion and Implications: This study highlights the complex interplay of SES with factors such as race, education, family support, and functional capacity and their association with informal care use. The findings accentuate the need for further research examining the influence of predisposing, enabling, and need factors associated with formal and informal care.

Introduction

According to U.S. Census Bureau population projections, 21% of the US population will be 65 or older by 2030, and this proportion of the population will continue to rise over the next 30 years, reaching 25% by 2060 (United States Census Bureau, 2020b). The same report projects that the population aged 85 and older will triple during this time. More than half of adults age 65 and older need some type of long-term service or support (LTSS) during the remainder of their lifetime, with risk being higher for those over age 85 (Johnson et al., 2021). LTSS encompasses an array of services that enable people to live more independently by assisting with activities of daily living (ADL) and instrumental activities of daily living (IADL). These services and supports include home and community-based services (HCBS), which are services provided at home or in the community, or institutional care, which refers to care provided in a facility such as an assisted living or skilled nursing center. LTSS can be provided formally (paid) and informally (unpaid). Medicaid, a public insurance program for low-income earners, is the largest payor of formal LTSS expenditures in the U.S at 52% (Horstman et al., 2023). The remainder of the expenditures are spread across various government programs such as the Older Americans Act and the Veterans Administration (15%), private long-term care insurance (9%), and out-of-pocket payments or private payments (24%) (Horstman et al., 2023). Approximately 40% of adults aged 50 and older are under the assumption that Medicare covers long-term care costs, while another 18% think private health insurance will cover long-term care costs (Hamel & Montero, 2023). In reality, both only cover short-term, medically necessary services under certain criteria. Misconceptions related to how long-term care is paid for contributes to lack of financial planning for future care needs. Less than half of adults aged 50 and older report taking steps to plan for care needs in their later years (Hamel & Montero, 2023).

Informal care by family and friends is an essential part of the LTSS spectrum and has long been the primary source of care for older adults (U.S. Department of Health and Human Services, 2020). Reliance on informal care is due to a variety of factors, such as societal and cultural norms (Zarzycki et al., 2023), preference (Abrahamson et al., 2017; Eckert et al., 2004; Kasper et al., 2019), and access to and affordability of formal care (Kemper, 1992; Mommaerts, 2018; Van Houtven & Norton, 2004). Prior research has found that the majority of older adults expect a family member to provide care if needed (Abrahamson et al., 2017; Henning-Smith & Shippee, 2015), and this expectation contributes to a lack of financial preparation for LTSS expenses (Brown et al., 2012). Informal care, especially from adult children, can reduce out-of-pocket expenditures by preventing or delaying more costly formal care alternatives (Van Houtven & Norton, 2004).

Inadequate planning and preparation for LTSS is a documented public policy concern (Robison et al., 2014; Wiener et al., 2015), yet most policy initiatives related to the accessibility of LTSS are focused on low-income populations. This is largely attributable to the fact that Medicaid is the largest payor of LTSS (Congressional Research Service, 2023). Middle-income earners, who may be initially ineligible for Medicaid, represent the largest segment of the population over age 65 (Administration for Community Living, 2021). The typical middle-income household, those earning anywhere from two-thirds to double the national median household income (Pressman, 2015; Tyson et al., 2021), risks not having adequate resources to cover the out-of-pocket costs associated with LTSS, especially if services are needed for an extended period. Most individuals will need some type of LTSS, and more than half will be unable to afford the care they need (West & Dubay, 2019). Approximately 40% of adults aged 50 and older are under the assumption that Medicare covers long-term care costs, while another

18% think private health insurance will cover long-term care costs (Hamel & Montero, 2023). In reality, both only cover short-term, medically necessary services under certain criteria. Misconceptions related to how long-term care is paid for contributes to lack of financial planning for future care needs. Less than half of adults aged 50 and older report taking steps to plan for care needs in their later years (Hamel & Montero, 2023). These misconceptions and financial barriers contribute to greater reliance on informal care from family and friends. However, as the pool of informal caregivers declines due to reduced fertility rates, lower marriage rates, higher divorce rates, and greater geographic mobility among family units, dependency on formal care is expected to increase (U.S. Department of Health and Human Services, 2020). This shift will likely exacerbate the challenges those with limited financial resources face.

Research tends to focus on populations deemed vulnerable and at greatest risk. Historically, the population over age 65 has had the highest proportion of people living in poverty, making them a vulnerable low-income population of interest to researchers. As demographics have shifted, the older population now has a lower proportion of people living in poverty than any other age group (United States Census Bureau, 2020a), and the middle-class proportion of older adults is increasing (Kochhar & Sechopoulos, 2022) and facing barriers related to the cost of LTSS. The middle class is a vulnerable population, underrepresented in research. My research aimed to fill this gap by examining the differences in formal versus informal care utilization by SES to uncover factors that warrant further research. Central to my research are two pivotal questions: “How do the types of LTSS used, categorized as formal and informal, vary across the SES classes?” and “Do individuals from the middle class have a greater propensity towards utilizing informal care than their counterparts?” My research intends not to characterize these relationships definitively but to identify potential nuances in the relationship between SES and LTSS utilization and identify areas of further inquiry.

Review of the Literature

Most people underestimate their risk of needing LTSS in their lifetime and report being inadequately prepared for future care needs (Wiener et al., 2015). According to the Administration for Community Living (ACL), 69% of older adults will use some type of LTSS, either formal or informal, and the average length of care is three years (ACL, 2020). While the remaining one-third of older adults will never need LTSS, 20% of those who do will need it for more than five years. The ACL has reported that 65% of older adults will use some type of care at home during their lifetime, with a slight majority receiving informal care (59%) as opposed to formal care, and the average duration of care at home is two years (ACL, 2020). Thirty-seven percent of older adults will receive formal care in assisted living, skilled nursing, or a combination of both during their lifetime, with an average duration of one year (ACL, 2020). In a first-of-its-kind study of what has been called the "The Forgotten Middle", researchers examined attributes of middle-class older adults aged 75 and older and their ability to afford residential senior housing, focusing on independent and assisted living care, which are primarily private pay options (Pearson et al., 2019). Their research was based on the premise that the residential housing industry is not focused on the needs of the middle class, and those needs will increase as the proportion of middle-class older adults increases, primarily in the cohort of 75 to 84-year-olds. These researchers suggest that less than 20% of middle-income seniors will have the financial resources to afford private-pay options, leaving those without an informal support network facing barriers in access to care.

Whether an individual receives formal or informal care can be influenced by several factors. The Andersen healthcare utilization model (Andersen & Newman, 1973) provides a framework for categorizing these factors as predisposing, enabling, or need-based. Predisposing variables can include race, age, and gender, and education. When assessing long-term care utilization patterns, pertinent enabling variables include marital status, living situation, number of children, and type of insurance coverage. Need variables are generally represented by chronic conditions that can contribute to functional impairment and limit one's ability to complete activities of daily living on their own. Various predisposing, enabling, and need factors have been examined as predictors of or factors associated with long-term care use, such as the role of race and ethnicity (Angel & Angel, 2006; Wallace et al., 1998), the role of gender (Hooyman, 2014; Mutchler & Bullers, 1994; Steinbeisser et al., 2021), and even the role of family structure and living arrangement (Choi et al., 2021; U.S. Department of Health and Human Services, 2020). Affordability of care is another factor likely to influence whether an individual receives formal or informal care, but less is known about the role of SES as an enabling factor associated with LTSS utilization. Much of the current research related to SES and formal versus informal care is limited in that it examines primarily European and Asian populations (Abbing et al., 2023; Kong et al., 2014; Lera et al., 2020; Wrotek & Kalbarczyk, 2023); and is likely not to represent the dynamics related to LTSS options and provision of care in the United States (Kemper, 1992).

Predisposing Factors

Age is a primary determinant in the need for and type of LTSS utilized (U.S. Department of Health and Human Services, 2021). As individuals age, the likelihood of using LTSS increases due to higher prevalence of chronic conditions and functional limitations (Johnson et al., 2021).

A study by Freedman and Spillman (2014) highlighted that the demand for long-term care services rises sharply with age, especially for those aged 85 and above. Increased age is a stronger predictor of formal care use than informal care use (Portrait et al., 2000).

Racial and ethnic differences significantly influence the utilization patterns of long-term care services as well. Minority populations, particularly Blacks and non-White Hispanics are more likely to rely on informal care than formal care (Angel & Angel, 2006; Kemper, 1992). Gender is another critical factor affecting long-term care utilization. A higher proportion of women use LTSS compared to men, partly due to longer life expectancies and higher rates of disability and chronic conditions in older age (U.S Department of Health and Human Services, 2019). Gender differences in formal versus informal care use are varied. Some researchers have found women more likely to use formal long-term care services than men (Hooyman, 2014; Mutchler & Bullers, 1994; Steinbeisser et al., 2021), while others have found women more likely to use informal care than men (Kwak et al., 2021). Regarding education, those with higher levels of educational attainment have an increased propensity toward formal care options (Lera et al., 2020; Wee et al., 2014; Wrotek & Kalbarczyk, 2023; Zhao et al., 2022), and those with less education are inclined toward informal care (Lera et al., 2020). Others have found that education is only associated with a propensity for formal care among women, not men (Fu et al., 2017; Steinbeisser et al., 2021).

Enabling Factors

Spouses and adult children provide the majority of informal care (U.S. Department of Health and Human Services, 2020). As such, individuals living alone are more likely to use formal care services than those married or living with others, such as adult children (Steinbeisser et al., 2021). Just over one-third of single older adults with no children receive formal care, three times more than those who are married with children (U.S. Department of Health and Human Services, 2020). Married individuals are less likely than single individuals to use formal care (Choi et al., 2021; Mutchler & Bullers, 1994), but gender plays a role, with married women more likely than married men to receive formal care (Mutchler & Bullers, 1994; Potter, 2019). Those with no adult children have a lower probability of receiving informal care than those with at least one adult child (Choi et al., 2021). The probability of receiving informal care is higher for those residing with an adult child than for those who do not (Choi et al., 2021). In general, the availability of a spouse or child reduces the probability of using formal care (Kemper, 1992). Other enabling factors, such as higher income, have been associated with greater likelihood of using formal care over informal care (Kemper, 1992; Wee et al., 2014), while others have found higher income to be associated with increased use of informal care compared to lower income (Chen et al., 2023). While having public or private insurance to assist with long-term care costs has been associated with increased formal care utilization, those with private insurance are more likely to report under-met needs than those with public insurance (U.S. Department of Health and Human Services, 2000).

Need Factors

Research consistently finds that need factors are the strongest predictors of LTSS use (Wrotek & Kalbarczyk, 2023). Higher disability levels and multiple chronic conditions are significantly associated with the use of formal versus informal care (Pinquart & Sörensen, 2011; Steinbeisser et al., 2021; Wolff et al., 2008). When informal care is substituted for formal care, as the level of disability increases, the shift toward formal care increases in tandem (Bonsang, 2009). Increased ADL dependence has been shown to be the strongest predictor of formal care compared to informal care (Wrotek & Kalbarczyk, 2023). Having a cognitive impairment such as dementia has also been positively associated with formal care use compared to informal care use (Wrotek & Kalbarczyk, 2023).

The literature reviewed provides a foundational understanding of the interplay of various predisposing, enabling, and need factors as determinants associated with informal and formal care use among older adults. These factors, serving as control variables in my analysis, allow for a comprehensive examination of the relationship between SES and informal versus formal care utilization.

Methods

Study Design and Participants

This study used cross-sectional data from round nine (2019) of the National Health and Aging Trends Study (NHATS). NHATS data has been used to examine trends in late-life disability and social and economic consequences among individuals aged 65 and older in the United States. NHATS interviews older adults across the LTC continuum and includes those residing at home and individuals residing in care facilities. The NHATS design allows for differentiation between those receiving formal and informal care. Additional information on the NHATS sampling design and methods is detailed elsewhere (Kasper & Freedman, 2020).

The 2019 round included 4,977 respondents. Those who did not report having the outcome of interest (paid or unpaid helper) were excluded (*n*=1092), as were those with missing data related to control variables (*n*= 96*)*. The final sample for this study (n=3789) included individuals age 65 and older who reported having paid or unpaid help with any ADLs (bathing, dressing, feeding, toileting, mobility), IADLS (transportation, shopping, laundry, meal preparation, medication management), or supplemental tasks (attending doctor appointments, assisting with decisions related to insurance, financial matters, and banking). The sample included individuals living at home (*n*=3425; 90.4%) as well as individuals living in residential care communities (*n*=261; 6.9%) or skilled nursing facilities (*n*=103; 2.7%).

Measures

Socioeconomic Status

The independent variable of interest is SES, presented categorically as low, middle, and upper. The criteria for determining socioeconomic status (SES) differs from one study to another and between various populations, as does the categorization of low, middle, and high-income SES groups. Following the guidance of Grundy and Holt (2001), I opted for a measure of SES based on household income. Participants in the NHATS survey disclose their entire household income, including Social Security, Supplemental Security Income, payments from the Veterans Administration, pensions, retirement savings, and earnings from investments. NHATS offers estimated income figures to accommodate participants who either did not disclose their income or did so in ranges only (DeMatteis et al., 2020). In the 2019 data collection, 69% of participants reported their total income, while 18% specified their income in a range (DeMatteis et al., 2020). For 87% of the participants, NHATS formulated a bracketed income figure, and for 13%, NHATS imputed income data (DeMatteis et al., 2020). Owing to NHATS' comprehensive method of collecting income data, household income reasonably reflects participants’ SES to examine the relationship with LTSS utilization.

SES income class definitions commonly employ two approaches: 1) segmentation into quintiles, designating the lowest 20% as low-income, the central 60% as middle-income, and the highest 20% as high-income; and 2) classification based on median national household income, with households earning below two-thirds of the median categorized as low-income, those earning between two-thirds and twice the median as middle-income, and those earning above twice the median as high-income (Pressman, 2015; Tyson et al., 2021). In my analysis, I applied the second method, referencing the 2019 median national household income of $68,703 (U.S. Census Bureau, 2020a). The median household income for individuals over 65 in 2019 was only marginally higher, at $70,254 (Administration for Community Living, 2020). Further insights into middle-class definition and measurement are discussed in other works (Elwell, 2014; Kochhar & Sechopoulos, 2022; Pressman, 2015; Tyson et al., 2021). I used SES categories of <$45,803 (low), $45,803-$137,407 (middle), and >$137,407 (high). Additionally, I performed a sensitivity analysis using quintile-based income thresholds of <$28,000 (low), $28,001-$80,000 (middle), and >$80,000 (high) to determine if different thresholds yielded different results.

Care Type

The outcome variable of interest was the type of care used, represented as formal versus informal care. Individuals who reported someone assisted with bathing, dressing, feeding, toileting, mobility, transportation, doctor appointments, shopping, banking, laundry, meal preparation, medication management, or insurance/financial decisions were asked about the relationship of the person who helped them and whether the helper was paid or unpaid. These results are stored in the NHATS Other Person (OP) file. To create the "care type" variable, data on whether the assistance received was paid or unpaid was merged from the NHATS Other Person (OP) file and matched to the sample person in the NHATS Sample Person (SP) file. If the helper was paid, the care type was classified as formal. If the helper was unpaid, the care type was classified as informal. If an individual reported receiving both formal and informal care, the care type was classified as formal.

Control Variables

Control variables included the predisposing, enabling, and need variables identified in the theoretical framework (Andersen & Newman, 1973). Predisposing variables included age, gender, race/ethnicity, and educational attainment. Each variable was represented categorically with three age groups (65-74; 75-84; 85 or older); two gender groups (men and women); three race groups (white non-Hispanic; Black non-Hispanic; Hispanic/Other); and four education groups (< high school diploma; high school diploma; 2-4 years of college; > bachelor's degree). Enabling variables included marital status (married/living together; or single/divorced/widowed); children (yes/no); and long-term care coverage, including Medicaid, Veterans' Benefits, LTC insurance, including government funded and private coverage (yes/no). Need was represented by the presence of probable dementia (yes/no); number of chronic conditions: heart disease, high blood pressure, arthritis, stroke, diabetes, cancer, lung disease, and osteoporosis (0; 1-2; 3 or more); reported limitations related to IADLs of shopping, cooking, medication management, and laundry (0, 1-2; 3 or more); and reported limitations related to ADLs of bathing, dressing, feeding, mobility, and toileting (0, 1-2; 3 or more).

Analysis

Bivariate analyses explored the relationships between SES and formal versus informal care and the relationship between SES and control variables. To address the first research question, "How do the types of LTSS used, categorized as formal and informal, vary across the SES classes?", I used logistic regression models incorporating all SES categories. To address the second research question, "Do middle-class individuals have a greater propensity towards utilizing informal care compared to their counterparts?", I used two separate logistic regression models to compare middle-class to lower-class and middle-class to upper-class. This approach provided a targeted analysis of middle-class propensity toward informal care compared to the other SES groups, accounting for differences between the upper and lower SES groups. Logistic regression models examined differences in the type of care used by SES and whether middle-SES older adults had increased odds of using informal care. A stepwise approach with backward elimination determined the most significant factors associated with care type. This process involved iteratively removing variables from the logistic regression model based on their statistical significance, using a p-value threshold of 0.10. This stepwise elimination process ensured that the final logistic regression model included only those variables that were statistically significant and most strongly associated with the type of care received. This approach is a standard method in statistical analysis to refine models by focusing on the most influential predictors (Bursac et al., 2008; Dunkler et al., 2014) . Analyses were conducted in Stata Version 18.0 (Stata Corp., College Station, TX).

Results

Descriptive Summary of Participants

Table 2a presents the descriptive characteristics of participants. The care type distribution showed 78.3% receiving informal care and 21.7% receiving formal care. For the SES category, 58.2% were in the low-SES bracket, followed by 34% in the middle-SES bracket and 7.8% in the upper-SES bracket. Just under half were aged 75-84 (48.1%), 31.5% were aged 85+, and 20.3% were aged 65-74. The majority of the sample was White (71.2%), followed by Black (20.2%) and Other races (8.6%). A larger percentage were women (58.2%) than men (41.8%), and 92.6% had children or step-children. Slightly more participants were single, divorced, widowed, or never married (51.3%) than were married or living together (48.7%). About two-thirds had a high school diploma (32.6%) or 2-4 years of college (32.9%). A slight majority had no public or private insurance benefit for LTSS (54.4%). About 10% reported a dementia diagnosis, 56.1%

reported three or more chronic conditions, and about half reported one or more ADL and IADL impairments.

Bivariate Results – Factors Associated with Informal Care

Table 2b displays the bivariate analysis results. No significant association between SES and care type (*p* = 0.17) was found in the bivariate analysis; however, all predisposing, enabling, and need variables had statistically significant associations with informal care. Participants in the oldest age group had lower odds of using informal care (OR = 0.65, 95% confidence interval [CI] = [0.52,0.81]) compared to those aged 65-74. Black individuals and those from other ethnic backgrounds had lower odds of receiving informal care compared to White individuals (OR = 0.83, 95% CI = [0.69,1.00], OR 0.67, 95% C = [0.51,0.87], respectively). The odds of using informal care among women was lower than men (OR = 0.85, 95% CI = [0.73,0.99]). Single individuals (OR =0.49, 95% CI = [0.42, 0.58]) had lower odds of using informal care than married individuals. Those with children had increased odds of using informal care compared to those without children (OR = 1.66, 95% CI = [1.27, 2.17]). The findings indicate a positive association between high school education and the use of informal care services (OR = 1.50, 95% CI = [1.20, 1.87]) compared to those who did not complete high school. Individuals with long-term care coverage had lower odds of using informal care (OR = 0.58, 95% CI = [0.49, 0.68]), as did having a dementia diagnosis (OR = 0.43, 95% CI= [0.34-0.54]), or three or more chronic conditions (OR =0.47, 95% CI = [0.30,0.75]). Functionally, increased ADL (OR = 0.65, 95% CI = [0.54, 0.79] to OR=0.21, 95% CI = [0.18,0.26]) and IADL needs (OR = 0.52, 95% CI = [0.43, 0.64] to OR= 0.20, 95% CI = [0.43,0.64]) all showed decreased odds of using informal care compared to those with no ADL and IADL needs.

Unadjusted and Adjusted Logistic Regression Outcomes

To address the first research question, how do the types of LTSS used vary across SES, Table 2c presents the unadjusted and adjusted odds of receiving informal care across all SES categories. In the adjusted model, both the middle and upper-SES groups had decreased odds of receiving informal care (OR = 0.69, 95% CI = [0.55,0.86], *p* = 0.001 and OR = 0.52, 95% CI = [0.36, 0.74], *p* = < 0.001, respectively). Women had increased odds of receiving informal care (OR = 1.17, 95% CI = [0.97, 1.42], *p* = 0.089) compared to men. Those with children had higher odds of receiving informal care (OR = 1.43, 95% CI = [1.06, 1.90], *p* = 0.016) than those without, while single individuals had lower odds of receiving informal care compared to partnered individuals (OR = 0.52, 95% CI = [0.42, 0.64], *p* = < 0.001). Having 2-4 years of college or an advanced degree was associated with lower odds of receiving informal care (OR = 0.65, 95% CI = [0.53, 0.79], *p* = < 0.001 and OR = 0.59, 95% CI = [0.45, 0.78], *p* = < 0.001, respectively). Those with long-term care coverage also had lower odds of receiving informal care than those without (OR = 0.69, 95% CI = [0.59, 0.82], *p* = < 0.001). Odds of receiving informal care were also lower for those with three or more chronic conditions (OR=0.79, 95% CI=[0.66, 0.95], *p* = 0.012), three or more ADLs (OR=0.47, 95% CI=[0.38, 0.60], *p* = < 0.001), and any assistance with IADLS, with the lowest odds among those with three or more impairments (OR=0.35, 95% CI=[0.26, 0.45], *p* = < 0.001). Age and dementia were not significantly associated with informal care. The goodness of fit for both the adjusted and unadjusted models was assessed using the Pearson chi-squared test. The unadjusted model yielded a strong goodness-of-fit (Pearson chi2(2232) = 2109.22, Prob > chi2 = 0.969). The adjusted model yielded lower explanatory power but also produced an acceptable fit (Pearson chi2(759) = 760.93, Prob > chi2 = 0.473). The Pseudo R-squared values were low in both models, with the first model at 0.112 and the second at 0.111.

To address the second research question, do individuals in the middle-SES have a greater propensity towards utilizing informal care compared to their lower-SES counterparts, Table 2d presents the unadjusted and adjusted odds of informal care utilization using distinct comparisons of the middle-SES group to the lower-SES group and the middle-SES group to the upper-SES group. In the comparison of the middle-SES group to the lower-SES group, those in the middle-SES group had decreased odds of using informal care (OR 0.67; 95% CI = [0.54,0.84], *p* = < 0.001). In this model, other factors significantly associated with decreased odds of using informal care were: being single, compared to being partnered (OR = 0.57; 95% CI = [0.46,0.69], p=0.005); having a 2-4 years of college (OR = 0.65; 95% CI = [0.53,0.79], *p* = < 0.001) or more than 4 years of college, compared to not completing high school (OR = 0.64; 95% CI = [0.48,0.87], p=0.000); having insurance (OR = 0.69; 95% CI = [0.58,0.82], *p* = < 0.001); having 3 or more chronic illnesses (OR = 0.80; 95% CI = [0.69,0.97], p=0.022); having three or more ADL limitations (OR = 0.47; 95% CI = [0.37,0.59], *p* = < 0.001); and having any IADL limitations (OR = 0.59; 95% CI = [0.48,0.75], *p* = < 0.001) ; OR = 0.34; 95% CI = [0.26,0.45], *p* = < 0.001), compared to having none. The goodness of fit for both the adjusted and unadjusted models was assessed using the Pearson chi-squared test. The unadjusted model yielded a strong goodness-of-fit (Pearson chi2(2038) = 1937.95, Prob > chi2 = 0.943). The adjusted model yielded lower explanatory power but also produced an acceptable fit (Pearson chi2(420) = 440.50, Prob > chi2 = 0.236). The Pseudo R-squared values were low in both models, with the first model at 0.117 and the second at 0.115. The adjusted model was more parsimonious, reflecting a more concise set of predictors without compromising the model's overall fit.

In the models comparing the middle-SES group with the upper-SES group, the adjusted model was more parsimonious, reflecting a more concise set of predictors without compromising the model's overall fit. Those in the middle-SES group had increased odds of receiving informal care (OR = 1.36; 95% CI = [0.98,1.89], *p*=0.0660. Other factors significantly associated with increased odds of using informal care included age, for those aged 75-84 compared to those aged 65-74 (AOR = 1.30; 95% CI = [1.00,1.69]; *p* = 0.046); and race, with Black individuals having increased odds of using informal care compared to White individuals (OR = 1.54; 95% CI = [0.93,2.57], *p*=0.093. More education was associated with lower odds of using informal care: for high school education (OR = 0.33; 95% CI = [0.11, 0.97], *p* = 0.044), 2-4 years of college education (OR = 0.23; 95% CI = [0.08, 0.66], *p* = 0.006), and more than four years of college education (OR = 0.21; 95% CI = [0.07, 0.62], *p* = 0.005), all compared to those with less than high school education. Other factors significantly associated with decreased odds of using informal care included being single (OR = 0.46; 95% CI = [0.34,0.61], *p* = < 0.001) compared to being partnered; and having 3 or more chronic illnesses (OR = 0.95; 95% CI = [0.53, 0.89] , *p*=0.006) , ADL needs (OR = 0.36; 95% CI =[0.24, 0.54], *p* = < 0.001), or IADL needs (OR = 0.64; 95% CI = [0.42, 0.97], *p* = < 0.001) compared to those with no chronic illnesses or ADL and IADL needs. The unadjusted model yielded a strong goodness-of-fit (Pearson chi2(916) = 865.15, Prob > chi2 = 0.884). The adjusted model yielded lower explanatory power but also produced an acceptable fit (Pearson chi2(186) = 209.67, Prob > chi2 = 0.113). The Pseudo R-squared values were low in both models, with the first model at 0.093 and the second at 0.089.

Sensitivity Analysis

The results of a sensitivity analysis using the percentile approach for measuring SES, not shown, were not meaningfully different from the results presented.

Discussion

My research addressed two questions. In response to the first question, how do the types of LTSS used vary across SES categories; the majority of study participants received informal care, regardless of their SES. In the adjusted results, participants in the middle and upper-SES brackets had lower odds of using informal care compared to those in the low-SES bracket. While most studies report the associations of these factors relative to formal care use, formal and informal care are often reciprocally related, such that having increased odds of using formal care corresponds to decreased odds of using informal care. As such, my findings that higher-income (Kemper, 1992; Wee et al., 2014), higher education (Lera et al., 2020; Wee et al., 2014; Wrotek & Kalbarczyk, 2023; Zhao et al., 2022), being single (Choi et al., 2021; Mutchler & Bullers, 1994), having insurance (U.S. Department of Health and Human Services, 2000), and having multiple chronic conditions and ADL deficits (Pinquart & Sörensen, 2011; Steinbeisser et al., 2018; Wolff et al., 2008; Wrotek & Kalbarczyk, 2023) are inversely associated with informal care are consistent with the studies mentioned above which found these factors to be positively associated with formal care. Higher-income individuals may be better equipped financially to afford formal care, such as paid care at home or facility-based care, reducing their reliance on informal care. Similarly, higher levels of education may contribute to greater awareness of formal care options and decreased reliance on informal care. It is also worth considering that those with higher education or increased income may have smaller informal support networks. Older adults who live alone are likely to have a more limited informal support network, given that spouses are a primary source of informal care (Pinquart & Sörensen, 2011).

Having public or private insurance that assists with LTSS expenses can contribute to increased formal care use since it reduces the out-of-pocket costs associated with formal care, thus potentially making it more accessible. Individuals with multiple chronic conditions and ADL deficits may require more specialized care than informal caregivers can provide, leading to a greater use of formal care services. Being female and having children was associated with increased odds of using informal care is also consistent with prior research (Choi et al., 2021; Kwak et al., 2021); however, gender differences in formal versus informal care use are mixed, and the majority of research has found women more likely to use formal care than men (Hooyman, 2014; Mutchler & Bullers, 1994; Steinbeisser et al., 2021).

My findings are particularly interesting in the SES context, given that women often have fewer financial resources than men (Mutchler et al., 2021), limiting their access to formal care options and contributing to greater reliance on informal care. It is not surprising that having children is positively associated with receiving informal care since children are one of the primary providers of informal care (Pinquart & Sörensen, 2011). My findings related to the association of race and ethnicity yielded conflicting results in contrast with the literature. While prior research has shown that Blacks and non-White Hispanics are more likely to rely on informal care than formal care (Angel & Angel, 2006; Kemper, 1992), my results show this association to be significant among Other races (i.e., non-White Hispanics, Asian, Native Hawaiin, American Indian) but not among Blacks. The conflicting results in race and ethnicity suggest that family arrangements, cultural factors, and community support systems may play a role in the type of care used. The lack of association among Blacks might indicate a more complex interplay of factors for this demographic not captured in my study. Inherent limitations exist when combining cultural, racial, and ethnic identities into one category, thus making it inadvisable to interpret the meaning of the association between Other races and informal care use. While age has been shown to be a significant predictor of LTSS use (Freedman & Spillman, 2014; Portrait et al., 2000), both formal and informal, my research yielded no significant association. The absence of an association with age might suggest that other factors, such as individual health status or the availability of informal caregivers, are more decisive in care choices than age alone.

In response to the second question, do middle-class individuals have a greater propensity towards utilizing informal care compared to their counterparts; the separate comparisons of the middle-SES group to both the lower-SES and upper-SES groups revealed nuanced dynamics. While individuals in the middle-SES group had decreased odds of using informal care compared to those in the lower-SES group, the association reversed when comparing the middle-SES to those in the upper-SES group. This pattern reflects broader socioeconomic and demographic influences on care utilization, where those not at the extremes of the economic spectrum may have different access to or needs for informal care. While not as financially constrained as lower-SES individuals, those in the middle-SES group still have a degree of reliance on informal care that could be attributable to financial limitations that prevent them from fully accessing formal care services. Conversely, compared to the upper-SES group, their increased propensity for informal care further accentuates potential financial barriers to accessing formal care. These findings may indicate those in the low-SES group are protected by government assistance programs to assist with the cost of care, and those in the upper-SES group have greater financial resources to cover the cost of care.

The positive association between participants aged 75-84 with informal care use in the comparison of the middle and upper-SES groups may reflect a period of transition where independence begins to decline, but care needs are still manageable through informal support. For those with limited financial resources, relying on informal care at this stage may be more feasible than seeking formal care for less intensive needs. The significant positive association between Black individuals and informal care use in the middle versus upper-SES comparison might reflect strong community or familial support networks that prevail over financial resources.

Having children is positively associated with informal care use among the middle-SES group compared to the lower-SES group, which is likely attributed to the availability of familial caregivers willing to provide care. This association's absence in the comparison between middle and upper-SES groups suggests that at higher income levels, the availability of financial resources might allow for greater choice in care options, diminishing the reliance on children for care. The inverse association between having insurance and receiving informal care in the middle versus lower-SES comparison, but not between middle and upper-SES groups, highlights how insurance might enable access to formal care, reducing reliance on informal care. This effect diminishes in the middle and upper-SES comparison, possibly because upper-SES individuals have greater financial means to access formal care regardless of insurance status. The significant association between having at least one IADL need and decreased odds of using informal care when comparing the middle-SES group to the lower-SES group suggests that those in the middle-SES group may have the financial resources to obtain formal assistance with less intensive tasks. This finding may be less pronounced in the comparison of the middle and upper-SES groups, resulting in a lack of significant association.

Implications

My research provides new insights into the complex dynamics of LTSS use across SES groups, revealing utilization patterns influenced by various factors, including income, education, gender, family structure, and racial/ethnic backgrounds. My findings highlight the role of SES in determining the odds of utilizing informal versus formal care, with middle-SES individuals exhibiting different care utilization patterns from their lower and upper-SES counterparts. These findings suggest a need for policy adjustments and service provisions that specifically address the needs of older adults in the middle-SES group, who may face financial limitations not encountered by those in the other SES brackets. Moreover, the significant influence of marital status and having children on informal care use highlights the importance of considering family structure and dynamics in LTSS planning, such that single individuals and those without children may need additional resources and support when faced with LTSS needs.

Additionally, the varied impact of racial and ethnic identities on formal and informal care use calls for culturally sensitive policies that acknowledge and address the diverse needs of our aging population, particularly as the population over age 65 becomes more racially and ethnically diverse. Lastly, the role of insurance in facilitating access to formal care emphasizes the importance of insurance coverage in the broader context of LTSS accessibility. A universal approach to long-term care coverage beyond Medicaid and private LTC insurance may be necessary to reduce reliance on informal care networks and improve access to formal care options. This could become a significant need in the coming years as informal care networks are expected to diminish due to changes in family structures. Together, these insights point toward the necessity for a multifaceted approach in designing and implementing LTSS policies and programs that are equitable, accessible, and responsive to the intricate needs of a diverse aging population.

Strengths and Limitations

A key strength of my research is its focused examination of SES, addressing a critical gap in the existing literature by exploring how formal and informal care utilization varies across different SES classes with a focus on the middle class. The targeted approach of my research, controlling for established predisposing, enabling, and need-based factors associated with LTSS utilization, provided valuable insights into how SES can influence the type of care used. My research's methodological rigor involved employing logistic regression analysis with stepwise backward elimination. This approach not only lent credibility to my findings but also ensured the inclusion of only statistically significant variables despite their potential theoretical significance.

In addition, individual models comparing the middle-SES group to those in the low and upper-SES groups provided additional detail that would have been lost by combining the distinctly different upper and lower-SES groups into one referent category. The findings from my study provide a foundation for future research on a segment of older adults currently under-represented in long-term care research. Future research opportunities include evaluating the relationship between SES and changes in LTSS use over time to provide insights into how these relationships evolve as individuals' circumstances change. Qualitative research can provide a deeper understanding of the reasons behind specific patterns of LTSS usage by SES group. Interviews or focus groups with older adults and their families could uncover nuanced factors influencing their choices. A mixed-methods approach would allow for triangulating findings and strengthening the overall study conclusions.

My study has limitations. The cross-sectional analysis relied on self-reported data for determining informal and formal care use. In surveys such as NHATS, participants may under-report or over-report their needs or care use, contributing to social desirability bias. The sample included all individuals who reported having assistance, even if the assistance was with supplemental tasks not classified as ADLs or IADLs. Given the nature of the supplemental tasks (i.e., attending doctor appointments, assisting with finances, and making insurance decisions), informal care may be overrepresented in my study. Future research may limit the sample to include only those reporting assistance with ADLs and IADLs. In addition, this analysis examined informal and formal care as mutually exclusive categories and did not account for those who use both. My study may underestimate the complexity of care utilization patterns by not considering a combined care category. It may bias the results given that those who use both types of care were placed in the more intensive care category (i.e., formal care). Lastly, considerable variability in how SES is measured exists across different studies. This variability can complicate comparisons across studies and may affect the consistency of findings.

Conclusion

The findings from my research offer insights into the dynamics between SES and LTSS utilization among older adults, highlighting how SES interacts with various factors such as race, education, and family structure in influencing the choice between formal and informal care. My research identified patterns in LTSS utilization across different SES classes, particularly highlighting the factors associated with informal care among specific demographics. These findings address a critical gap related to the role of SES and accentuate the need for policymakers, practitioners, and individuals to consider the multifaceted influences on LTSS decisions. Future research must continue to explore these influences, aiming to develop a more equitable long-term care support system that recognizes and accommodates our aging population's diverse needs and preferences.

References

Abbing, J., Suanet, B., & van Groenou, M. B. (2023). Socio-economic inequality in long-term care: a comparison of three time periods in the Netherlands. *Ageing and Society*, *43*(3), 643–663. https://doi.org/10.1017/S0144686X21000647

Abrahamson, K., Hass, Z., & Sands, L. (2017). Likelihood that expectations of informal care will be met at onset of caregiving need: a retrospective study of older adults in the USA. *BMJ Open*, *7*(12), e017791–e017791. https://doi.org/10.1136/bmjopen-2017-017791

Administration for Community Living. (2020). *How Much Care Will You Need*? LongTermCare.gov. https://acl.gov/ltc/basic-needs/how-much-care-will-you-need

Administration for Community Living. (2021). 2020 Profile of older Americans. U.S. Department of Health and Human Services. https://acl.gov/sites/default/files/Aging%20and%20Disability%20in%20America/2020ProfileOlderAmericans.Final_.pdf

Andersen, R., & Newman, J. F. (1973). Societal and individual determinants of medical care utilization in the United States. *The Milbank Memorial Fund Quarterly. Health and Society*, *51*(1), 95–124.

Angel, J. L., & Angel, R. J. (2006). Minority group status and healthful aging: Social structure still matters. *American Journal of Public Health*, *96*(7), 1152–1159. https://doi.org/10.2105/AJPH.2006.085530

Bonsang, E. (2009). Does informal care from children to their elderly parents substitute for formal care in Europe? *Journal of Health Economics*, *28*(1), 143–154. https://doi.org/10.1016/j.jhealeco.2008.09.002

Brown, J. R., Goda, G. S., & McGarry, K. (2012). Long-Term Care Insurance Demand Limited By Beliefs About Needs, Concerns About Insurers, And Care Available From Family. *Health Affairs*, *31*(6), 1294–1302. https://doi.org/10.1377/hlthaff.2011.1307

Bursac, Z., Gauss, C., Williams, D., & Hosmer, D. (2008). Purposeful selection of variables in logistic regression. *Source Code for Biology and Medicine*, 3(1), 17. https://doi.org/10.1186/1751-0473-3-17

Chen, S., Si, Y., Hanewald, K., Li, B., Wu, C., Xu, X., & Bateman, H. (2023). Association between multimorbidity and informal long-term care use in China: a nationwide cohort study. *BMC Geriatrics*, *23*(1), 700. https://doi.org/10.1186/s12877-023-04371-6

Choi, H., Heisler, M., Norton, E. C., Langa, K. M., Cho, T. C., & Connell, C. M. (2021). Family Care Availability And Implications For Informal And Formal Care Used By Adults With Dementia In The US. *Health Affairs (Project Hope)*, *40*(9), 1359–1367. https://doi.org/10.1377/hlthaff.2021.00280

Congressional Research Service. (2023). Who Pays for Long-Term Services and Supports. https://crsreports.congress.gov/product/pdf/IF/IF10343

DeMatteis, J., Freedman, V., Kasper, J., & Jiao, R. (2020). National Health and Aging Trends Study Round 9 Income Imputation. *NHATS Technical Paper #27*. Johns Hopkins University School of Public Health.

Dunkler, D., Plischke, M., Leffondré, K., & Heinze, G. (2014). Augmented backward elimination: A pragmatic and purposeful way to develop statistical models. *PloS One*, 9(11), e113677–e113677. https://doi.org/10.1371/journal.pone.0113677

Eckert, J. K., Morgan, L. A., & Swamy, N. (2004). Preferences for receipt of care among community-dwelling adults. *Journal of Aging & Social Policy*, 16(2), 49–65. https://doi.org/10.1300/J031v16n02_04

Elwell, C., (2014). The Distribution of Household Income and the Middle Class. Washington, DC: Congressional Research Service. https://fas.org/sgp/crs/misc/RS20811.pdf

Freedman, V. A., & Spillman, B. C. (2014). Disability and care needs among older Americans. *The Milbank quarterly*, *92*(3), 509–541. https://doi.org/10.1111/1468-0009.12076

Fu, Y. Y., Guo, Y., Bai, X., & Chui, E. W. T. (2017). Factors associated with older people's long-term care needs: A case study adopting the expanded version of the Anderson Model in China. *BMC Geriatrics*, *17*, 1-13.

Grundy, E., & Holt, G. (2001). The socioeconomic status of older adults: how should we measure it in studies of health inequalities? *Journal of Epidemiology and Community Health*, 55(12), 895–904. https://doi.org/10.1136/jech.55.12.895

Hamel, L., & Montero, A. (2023, November 14). *The affordability of long-term care and support services: Findings from a KFF survey*. Kaiser Family Foundation. https://www.kff.org/health-costs/poll-finding/the-affordability-of-long-term-care-and-support-services/

Henning-Smith, C. E., & Shippee, T. P. (2015). Expectations about future use of long-term services and supports vary by current living arrangement. *Health Affairs*, *34*(1), 39–47. https://doi.org/10.1377/hlthaff.2014.0556

Hooyman, N. R. (2014). Social and health disparities in aging: Gender inequities in long-term care. *Generations: Journal of the American Society on Aging*, *38*(4), 25–32. https://www.jstor.org/stable/26556073

Johnson, R. W., Favreault, M., Dey, J., Marton, W., & Anderson, L. (2021). *Most Older Adults Are Likely to Need and Use Long-Term Services and Supports Issue Brief*. Assistant Secretary for Planning and Evaluation. https://aspe.hhs.gov/reports/most-older-adults-are-likely-need-use-long-term-services-supports-issue-brief-0

Kasper, J., & Freedman, V. (2020). National Health and Aging Trends Study User Guide: Rounds 1-9 Final Release. Baltimore: Johns Hopkins University School of Public Health. https://nhats.org/sites/default/files/2021-04/NHATS_User_Guide_R9_Final_Release_0.pdf

Kasper, J., Wolff, J., & Skehan, M. (2019). Care arrangements of older adults: What they prefer, what they have, and implications for quality of life. *The Gerontologist*, 59(5), 845–855. https://doi.org/10.1093/geront/gny127

Kasper, J., & Freedman, V. (2020). National Health and Aging Trends Study User Guide: Rounds 1-9 Final Release. Baltimore: Johns Hopkins University School of Public Health. https://nhats.org/sites/default/files/2021-04/NHATS_User_Guide_R9_Final_Release_0.pdf

Kemper, P. (1992). The use of formal and informal home care by the disabled elderly. *Health Services Research*, *27*(4), 421. https://link.gale.com/apps/doc/A13528540/AONE?u=char69915&sid=bookmark-AONE&xid=c3f7962e

Kochhar, R., & Sechopoulos, S. (2022). How the American Middle Class has changed in the past five decades. Pew Research Center. https://www.pewresearch.org/short-reads/2022/04/20/how-the-american-middle-class-has-changed-in-the-past-five-decades/

Kong, F.-L., Hoshi, T., Ai, B., Shi, Z.-M., Nakayama, N., Wang, S., & Yang, S.-W. (2014). Association between socioeconomic status (SES), mental health and need for long-term care (NLTC)—A Longitudinal Study among the Japanese Elderly. *Archives of Gerontology and Geriatrics*, *59*(2), 372–381. https://doi.org/10.1016/j.archger.2014.04.015

Kwak, M., Kim, B., Lee, H., & Zhang, J. (2021). Does Gender Matter in the Receipt of Informal Care Among Community-Dwelling Older Adults? Evidence from a Cross-National Comparative Study Across the United States, South Korea, and China. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *76*(Supplement_1), S64–S75. https://doi.org/10.1093/geronb/gbaa018

Lera, J., Pascual-Sáez, M., & Cantarero-Prieto, D. (2020). Socioeconomic Inequality in the Use of Long-Term Care among European Older Adults: An Empirical Approach Using the SHARE Survey. *International Journal of Environmental Research and Public Health*, *18*(1), 20-. https://doi.org/10.3390/ijerph18010020

Mommaerts, C. (2018). Are coresidence and nursing homes substitutes? Evidence from Medicaid spend-down provisions. *Journal of Health Economics*, *59*, 125–138. https://doi.org/10.1016/j.jhealeco.2018.04.003

Mutchler, J., & Bullers, S. (1994). Gender Differences in Formal Care Use in Later Life. *Research on Aging*, *16*(3), 235–250. https://doi.org/10.1177/0164027594163001

Mutchler, J., Velasco Roldán, N., & Li, Y. (2021). Late-life Gender Disparities in Economic Security in the Context of Geography, Race and Ethnicity, and Age: Evidence from the

2020 Elder Index. *Center for Social and Demographic Research on Aging Publications*, (52). Retrieved from https://scholarworks.umb.edu/demographyofaging/52

Pearson, C. F., Quinn, C. C., Loganathan, S., Datta, A. R., Mace, B. B., & Grabowski, D. C. (2019). The Forgotten Middle: Many middle-income seniors will have insufficient resources for housing and health care. *Health Affairs*, *38*(5), 101377. https://doi.org/10.1377/hlthaff.2018.05233

Pinquart, M., & Sörensen, S. (2011). Spouses, adult children, and children-in-law as caregivers of older adults: a meta-analytic comparison. *Psychology and Aging*, *26*(1), 1–14. https://doi.org/10.1037/a0021863

Portrait, F., Lindeboom, M., & Deeg, D. (2000). The use of long-term care services by the Dutch elderly. *Health Economics*, *9*(6), 513–531. https://doi.org/10.1002/1099-1050(200009)9:6<513::AID-HEC534>3.0.CO;2-R

Potter, A. J. (2019). Care Configurations and Unmet Care Needs in Older Men and Women. *Journal of Applied Gerontology*, *38*(10), 1351-1370. https://doi.org/10.1177/0733464817733239

Pressman, S. (2015). Defining and Measuring the Middle Class. American Institute of Economic Research. https://www.aier.org/wp-content/uploads/2016/10/WP007-Middle-Class.pdf

Robison, J., Shugrue, N., Fortinsky, R. H., & Gruman, C. (2014). Long-term supports and services planning for the future: implications from a statewide survey of Baby Boomers and older adults. *The Gerontologist*, *54*(2), 297–313. https://doi.org/10.1093/geront/gnt094

Steinbeisser, K., Schwarzkopf, L., Grill, E., Schwettmann, L., Peters, A., & Seidl, H. (2021). Gender-linked determinants for utilization of long-term care in community-dwelling adults 65+ in Germany: Results from the population-based KORA-Age study. *Experimental Gerontology*, *153*, 111500–111500. https://doi.org/10.1016/j.exger.2021.111500

Tyson, A., Funk, C., Kennedy, B., & Johnson, C. (2021). *Methodology*. Pew Research Center Science & Society. https://www.pewresearch.org/science/2021/09/15/covid19-restrictions-methodology/

United States Census Bureau. (2020a). *Income and Poverty in the United States: 2019*. Census.Gov. https://www.census.gov/library/publications/2020/demo/p60-270.html

United States Census Bureau. (2020b). *Living longer: Historical and projected life expectancy in the United States, 1960 to 2060* (P25-1144). https://www.census.gov/content/dam/Census/library/publications/2020/demo/p25-1144.pdf

U.S. Department of Health and Human Services. (2000). *Multivariate analysis of patterns in informal and formal caregiving among privately insured and non-privately insured populations.* Office of the Assistant Secretary for Planning and Evaluation. https://aspe.hhs.gov/reports/multivariate-analysis-patterns-informal-formal-caregiving-among-privately-insured-non-privately-0

U.S. Department of Health and Human Services. (2019). What is the lifetime risk of needing and receiving long-term services and supports? Office of the Assistant Secretary for Planning and Evaluation.https://aspe.hhs.gov/reports/what-lifetime-risk-needing-receiving-long-term-services-supports-0

U.S. Department of Health and Human Services. (2020). *Informal Caregiver Supply and Demographic Changes*. Office of the Assistant Secretary for Planning and Evaluation. https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//198051/ICSupplyLR.pdf

U.S. Department of Health and Human Services. (2021).*Projections of Needing Long-Term Services and Supports at Ages 65 and Older.* https://aspe.hhs.gov/sites/default/files/private/pdf/265136/LTSSRisk.pdf

Van Houtven, C. H., & Norton, E. C. (2004). Informal care and health care use of older adults. *Journal of Health Economics, 23*(6), 1159-1180. https://doi.org/10.1016/j.jhealeco.2004.04.008

Wallace, S. P., Levy-Storms, L., Kington, R. S., & Andersen, R. M. (1998). The persistence of race and ethnicity in the use of LTC. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences, 53B(2), S104–S112*. https://doi.org/10.1093/geronb/53B.2.S104

Wee, S.-L., Liu, C., Goh, S.-N., Chong, W. F., Aravindhan, A., & Chan, A. (2014). Determinants of Use of Community-Based Long-Term Care Services. *Journal of the American Geriatrics Society*, *62*(9), 1801–1803. https://doi.org/10.1111/jgs.13003

West, J., & Dubay, L. (2019). Middle-income seniors face a gap in housing and health supports. Urban Institute. https://www.urban.org/urban-wire/middle-income-seniors-face-gap-housing-and-health-supports

Wiener, J., Khatutsky, G., Thach, N., Greene, A., Allaire, B., & Brown, D. (2015). Findings from the survey of Long-term Care Awareness and Planning Research Brief. https://aspe.hhs.gov/basic-report/findings-survey-long-term-care-awareness-and-planning-research-brie

Wrotek, M., & Kalbarczyk, M. (2023). Predictors of long-term care use - informal home care recipients versus private and public facilities residents in Poland. *BMC Geriatrics, 23*, 512. https://doi.org/10.1186/s12877-023-04216-2

Zarzycki, M., Morrison, V., Bei, E., & Seddon, D. (2023). Cultural and societal motivations for being informal caregivers: a qualitative systematic review and meta-synthesis. *Health Psychology Review*, *17*(2), 247–276. https://doi.org/10.1080/17437199.2022.2032259

Zhao, B., Kong, F., Shin, D. E., & Nam, E. W. (2022). Gender Disparity and the Association Between Socioeconomic Status, Mental Health, and the Need for Long-Term Services and Support Among the Older Koreans. *Frontiers in Public Health*, *10*, 888011. https://doi.org/10.3389/fpubh.2022.888011

Table 2a. Demographic and Functional Characteristics of Study Participants (*n*=3789)

Variable	**Category**	**Frequency (n)**	**Percentage (%)**
Caretype	Formal	822	21.7%
	Informal	2967	78.3%
SES	Low	2207	58.2%
	Middle	1287	34.0%
	Upper	295	7.8%
Age Group	65-74	771	20.3%
	75-84	1824	48.1%
	85+	1194	31.5%
Race/Ethnicity	White	2698	71.2%
	Black	767	20.2%
	Other	324	8.6%
Gender	Men	1584	41.8%
	Women	2205	58.2%
Children	No	281	7.4%
	Yes	3508	92.6%
Marital Status	Married	1847	48.7%
	Single	1942	51.3%
Education	< High School	758	20.0%
	High School/Trade	1234	326%
	2-4 yrs	1246	32.9%
	> 4 yrs	551	14.5%
Insurance	No	2061	54.4%
	Yes	1728	45.6%
Dementia	No	3394	89.6%
	Yes	395	10.4%
Chronic Illness	None	167	4.4%
	1-2	1497	39.5%
	3+	2125	56.1%
ADL	None	1886	49.8%
	1-2	1030	27.2%
	3+	873	23.0%
IADL	None	189	49.9%
	1-2	1078	28.5%
	3+	822	21.7%

Note: ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living).

Table 2b. Bivariate Analysis of Factors Associated with Informal Care (*n*=3789)

Variable	**Category**	**Care Type: Formal n=822**	**Care Type: Informal n= 2967**	**Total: n=3789**	**Pearson Chi2 P-value**	**Odd Ratio (95% CI)**
SES	Low	496 (22.47%)	1711 (77.53%)	2207	3.54(0.170)	Ref
	Middle	257 (19.97%)	1030 (80.03%)	1287		1.16(0.98-1.38)
	Upper	69 (23.39%)	226 (76.61%)	295		0.95(0.71-1.27)
Age Group	65-74	152 (19.71%)	619 (80.29%)	771	**33.52(0.000)**	Ref
	75-84	343 (18.80%)	1481 (81.20%)	1824		1.06(0.86-1.31)
	85+	327 (27.39%)	867 (72.61%)	1194		0.65(0.52-0.81)
Race/Ethnicity	White	551 (20.42%	2147 (79.58%)	2698	**11.26(0.004)**	Ref
	Black	181 (23.60%)	586 (76.40%)	767		0.83(0.69-1.00)
	Other	90 (27.78%)	234 (72.22%)	324		0.67(0.51-0.87)
Gender	Men	319 (20.14%)	1265 (79.86%)	15842	**3.88(0.049)**	Ref
	Women	503 (22.81%)	1702 (77.19%)	2205		0.85(0.73-0.99)
Children	No	86 (30.60%)	195 (69.40%)	281	**14.18(0.000)**	Ref
	Yes	736 (20.98%)	2772 (79.02%)	3508		1.66(1.27-2.17)
Marital Status	Married	290 (15.70%)	1557 (84.3%)	1847	**76.19(0.000)**	Ref
	Single	532 (27.39%)	1410 (72.61)	1942		0.49(0.42-0.58)
Education	< High School	184 (24.27%)	574 (75.73%	758	**19.15(0.000)**	Ref
	HS/Trade	217 (17.59%)	1017(82.41%)	1234		1.50(1.20-1.87)
	2-4 yrs	285 (22.87%)	961 (77.13%)	1246		1.08(0.87-1.33)
	> 4 yrs	136 (24.68%)	415 (75.32%)	551		0.98(0.76-1.26)
Insurance	No	361 (17.52%)	1700 (82.48%)	2061	**46.45(0.000)**	Ref
	Yes	461 (26.68%)	1267 (73.32%)	1728		0.58(0.49-0.68)
Dementia	No	677 (19.95%)	2717 (80.05%)	33944	**59.59(0.000)**	Ref
	Yes	145 (36.71%)	250 (63.29%)	395		0.43(0.34-0.54)
Chronic Illness	None	23 (13.37%)	144 (86.63%)	1672	**37.82(0.000)**	Ref
	1-2	264 (17.64%)	1233 (82.35%)	1497		0.70(0.47-1.18)
	3+	535 (25.18%)	1590 (74.73%)	2125		0.47(0.30-0.75)
ADL	None	261 (13.82%)	1628 (86.18%)	1889	**280.21(0.000)**	Ref
	1-2	212 (19.67%)	866 (80.33%)	1078		0.65(0.54-0.79)
	3+	349 (42.46%)	473 (57.54%)	822		0.21(0.18-0.26)
IADL	None	237 (12.57%)	1649 (87.43%)	1886	**295.75(0.000)**	Ref
	1-2	222 (21.55%)	808 (78.45%)	1030		0.52(0.43-0.64)
	3+	363 (41.58%)	510 (58.42%)	873		0.20(0.17-0.24)

Note: CI (Confidence Interval), ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living).
A p-value threshold of < 0.10 was considered statistically significant.

Table 2c. Odds Ratios (OR) for Factors Associated with Informal Care Comparing all SES Categories (*n*=3789)

		Unadjusted		**Adjusted**	
Variable	**Category**	**Odds Ratio (95% CI)**	**P-value**	**Odds Ratio (95% CI)**	**P-value**
SES	Low	Ref		Ref	
	Middle	**0.69(0.54-0.86)**	**0.001**	**0.69(0.55-0.86)**	**0.001**
	Upper	**0.51(0.36-0.74)**	**0.000**	**0.52(0.36-0.74)**	**0.000**
Age	65-74	Ref		Ref	
	75-84	**1.22(0.98-1.54)**	**0.079**	–	–
	85+	1.17(0.91-1.51)	0.206	–	–
Race/Ethnicity	White	Ref		Ref	
	Black	1.05(0.84-1.31)	0.640	1.12(0.94-1.39)	0.293
	Other	**0.72(0.53-0.98)**	**0.035**	**0.60(0.52-0.92)**	**0.013**
Gender	Men	Ref		Ref	
	Women	**1.17(0.97-1.42)**	0.098	**1.17(0.97-1.42)**	**0.089**
Children	No	Ref		Ref	
	Yes	**1.43(1.07-1.91)**	**0.015**	**1.43(1.06-1.90)**	**0.016**
Marital Status	Married	Ref		Ref	
	Single	**0.51(0.41-0.63)**	**0.000**	**0.52(0.42-0.64)**	**0.000**
Education	<HS	Ref		Ref	
	HS/Trade	1.02(0.79-1.31)	0.899	1.36(1.12-1.64)	0.001
	2-4 yrs	**0.66(0.51-0.85)**	**0.002**	**0.65(0.53-0.79)**	**0.000**
	> 4 yrs	**0.60(0.43-0.83)**	**0.002**	**0.59(0.45-0.78)**	**0.000**
Insurance	No	Ref		Ref	
	Yes	**0.69(0.59-0.82)**	**0.000**	**0.69(0.59-0.82)**	**0.000**
Dementia	No	Ref		Ref	
	Yes	0.89(0.69-1.16)	0.412	–	–
Chronic Illness	None	Ref		Ref	
	1-2	0.89(0.55-1.44)	0.635	1.21(1.01-1.45)	0.037
	3+	0.71(0.44-1.15)	0.162	**0.79(0.66-0.95)**	**0.012**
ADL	None	Ref		Ref	
	1-2	0.88(0.69-1.11)	0.276	1.28(1.06-1.56)	0.010
	3+	**0.44(0.33-0.59)**	**0.000**	**0.47(0.38-0.60)**	**0.000**
IADL	None	Ref		Ref	
	1-2	**0.64(0.51-0.81)**	**0.000**	**0.62(0.49-0.76)**	**0.000**
	3+	**0.37(0.28-0.49)**	**0.000**	**0.35(0.26-0.45)**	**0.000**

Note: CI (Confidence Interval), ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living); The outcome variable 'Care Type' is coded as 1 for informal care and 0 for formal care. A p-value threshold of < 0.10 was considered statistically significant

Table 2d. Odds Ratios (OR) for Factors Associated with Informal Care Comparing Middle to Low-SES and Middle to Upper-SES (*n*=3789)

	Middle Vs Low (n=3494)		**Middle Vs Upper (n=1582)**	
Variable	**UOR(95% CI), p-value**	**AOR(95% CI), p-value**	**UOR(95% CI) p-value**	**AOR(95% CI), p-value**
SES (Middle Vs Low)	0.67(0.53-0.85), 0.001	**0.67(0.54-0.84), 0.000**	**	**
SES (Middle Vs Upper)	**	**	1.36(0.98-1.90), 0.068	**1.36(0.98-1.89), 0.066**
Age (Ref: 65-74)	Ref	Ref	Ref	Ref
75-84	1.27(0.99-1.62), 0.054	—	1.44(1.04-1.97), 0.026	**1.30(1.00-1.69), 0.046**
85+	1.23(0.95-1.61), 0.118	—	1.28(0.87-1.89), 0.215	0.99(0.72-1.37), 0.956
Race (Ref: White)	Ref	Ref	Ref	Ref
Black	1.04(0.83-1.31), 0.724	1.11(0.89-1.39), 0.324	1.59(0.95–2.65), 0.077	**1.54(0.93-2.57), 0.093**
Other	0.70(0.51-0.95), 0.024	**0.67(0.50-0.89), 0.006**	1.41(0.66-2.99), 0.375	1.32(0.62-2.79), 0.467
Sex (Ref: Men)	1.16(0.95-1.41), 0.144	—	1.13(0.85-1.49), 0.402	—
Child (Ref: No)	1.51(1.12-2.04), 0.007	**1.54(1.14-2.07), 0.005**	1.33(0.83-2.13), 0.237	—
Marital Status (Ref: Married)	0.53(0.43-0.66) 0.000	**0.57(0.46-0.69), 0.000**	0.44(0.32-0.59), 0.000	**0.46(0.34-0.61), 0.000**
Education (Ref: <HS)	Ref	Ref	Ref	Ref
HS/Trade	0.99(0.77-1.28), 0.979	1.32(1.09-1.59), 0.004	0.33(0.11-0.96), 0.043	**0.33(0.11-0.97), 0.044**
2-4 yrs	0.65(0.49-0.85), 0.001	**0.65(0.53-0.79), 0.000**	0.23(0.08-0.67), 0.007	**0.23(0.08-0.66), 0.006**
> 4 yrs	0.65(0.46-0.92), 0.015	**0.64(0.48-0.87), 0.000**	0.22(.08-.064), 0.005	**0.21(0.07-0.62), 0.005**
Insurance (Ref: No)	0.69(0.57-0.82), 0.000	**0.69(0.58-0.82), 0.000**	0.99(0.76-1.29), 0.948	—
Dementia (Ref: No)	0.87(0.68-1.13), 0.296	—	1.18(0.69-2.03), 0.540	—
Chronic Illness (Ref: None)	Ref	Ref	Ref	Ref
1-2	0.99(0.59-1.65) ,0.986	1.24(1.02-1.48), 0.028	1.04(0.58-1.89), 0.876	1.39(1.07-1.82), 0.014
3+	0.78(0.47-1.29), 0.341	**0.80(0.69-0.97), 0.022**	0.71(0.39-1.29), 0.267	**0.69(0.53-0.89), 0.006**
ADL (Ref: None)	Ref	Ref	Ref	Ref
1-2	0.85(0.67-1.08), 0.196	1.28(1.05-1.56), 0.014	0.99(0.69-1.40), 0.951	1.37(0.99-1.88) ,0.053
3+	0.43(0.63-0.58), 0.000	**0.47(0.37-0.59), 0.000**	0.37(0.23-0.59) 0.000	**0.36(0.24-0.54), 0.000**
IADL (Ref: None)	Ref	Ref	Ref	Ref
1-2	0.62(0.49-0.79), 0.000	**0.59(0.48-0.75), 0.000**	0.77(0.55-1.07), 0.128	0.92(0.68-1.25), 0.605
3+	0.37(0.27-0.49), 0.000	**0.34(0.26-0.45), 0.000**	0.51(0.31-0.84), 0.00	**0.64(0.42-0.97), 0.037**

Note: CI (Confidence Interval), ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living); The outcome variable 'Care Type' is coded as 1 for informal care and 0 for formal care. A p-value threshold of < 0.10 was considered statistically significant

CHAPTER 3: EXAMINING THE RELATIONSHIP BETWEEN SOCIOECONOMIC STATUS AND UNMET CARE NEEDS AMONG OLDER ADULTS

Abstract

Background: This research examines the relationship between socioeconomic status (SES) and older adults' unmet care needs (UCN); guided by two key questions: “How does unmet care need differ by socioeconomic status?” and “Are those in the middle class more likely to experience unmet care needs?”. It addresses a gap in the current literature by emphasizing the middle class and whether they are more likely to experience UCNs.

Methods: Using cross-sectional data from the 2019 National Health and Aging Trends Study (NHATS), this study includes 2,493 individuals aged 65 and older who reported needing help with at least one activity of daily living (ADL or IADL). I examined the relationship between SES and UCN, controlling for predisposing, enabling, and need factors. Logistic regression models with backward elimination were used to determine significant factors associated with UCN.

Results: Those in the middle-SES group had increased odds of UCN compared to those in the low-SES group. No association was found in comparison to the upper-SES group. For all SES groups, being single and having IADL and ADL needs increased the odds of UCN, and the odds of UCN decreased with age. Having children was associated with increased odds of UCN for those in the middle-SES group but not the upper-SES group.

Discussion: These results highlight a potential vulnerability within the middle class as well as factors associated with UCN that are consistent across all SES groups. This insight provides a foundation for future research exploring these influences, aiming to develop a more equitable long-term care support system that recognizes and accommodates the needs of our aging population.

Introduction

Limited options for affordable long-term care have contributed to informal care by family and friends being an essential part of the LTSS continuum and has long been the primary source of care for older adults (U.S. Department of Health and Human Services, 2020). However, informal care is not always adequate to meet the needs of older adults, especially as the acuity of their needs increases (Schulz & Tompkins, 2010). As the pool of informal caregivers continues to decline due to reduced fertility rates, lower marriage rates, higher divorce rates, and greater geographic mobility among family units, dependency on formal care is expected to increase (Roth et al., 2015). This further exacerbates the challenges faced by those with limited financial resources. For those lacking informal care resources who cannot afford formal care, risk of having unmet care needs (UCN) exists. The definition of UCN can vary depending on the context in which the term is used. In this analysis, UCN refers to going without assistance with activities of daily living (i.e., bathing, dressing, feeding, toileting, and mobility) or instrumental activities of daily living (i.e., laundry, shopping, meal preparation, and medication management).

Review of the Literature

UCN among older adults exists when an individual is unable to perform an activity of daily living (ADL) or instrumental activity of daily living (IADL) and does not have adequate assistance to meet that need. Just over 40% of older adults report needing more assistance than they receive (Jenkins Morales & Robert, 2022), and about 44% report having at least one unmet need related to personal care, mobility, or household tasks (Beach & Schulz, 2017). Unmet care needs often result from insufficient care or care that does not align with the individual's needs (Scommenga & Sherburne, 2022). UCN can contribute to adverse outcomes, such as falls, medication errors, hospitalizations, nursing home admissions, and even premature death (Allen et al., 2014; Casado et al., 2011; Jenkins Morales & Robert, 2022); all of which can contribute to higher healthcare costs. More than 30% of older adults needing assistance with ADLs and IADLs have had at least one adverse consequence related to UCN (Freedman & Spillman, 2014).

SES impacts healthcare access and health-related outcomes for older adults (Fitzpatrick et al., 2004; McMaughan et al., 2020). Wealthier older adults have better access to care and better health outcomes, while low-income older adults have limited access to care and poorer health outcomes (McMaughan et al., 2020). Prior research has addressed how SES impacts overall access to healthcare (Fitzpatrick et al., 2004; McMaughan et al., 2020; Yamada et al., 2015), but less is known about access to long-term care, particularly for those in the middle class. Middle-income earners represent the largest segment of the population over age 65 (Administration for Community Living, 2021), yet little has been done to examine the challenges they face in accessing LTSS or the prevalence of UCN among this demographic. By 2029, two-thirds of middle-income earning older adults will have more than three chronic health conditions; more than half will have limited mobility; and one-fifth will have significant functional limitations (West & Dubay, 2019). The majority of these individuals will need some type of LTSS, and more than half will be unable to afford the care that they need (West & Dubay, 2019). Issues related to access and affordability of formal care can increase reliance on informal care (Kemper, 1992; Mommaerts, 2018; Van Houtven & Norton, 2004); however, informal care networks are declining due to reduced fertility rates, lower marriage rates, higher divorce rates, and greater geographic mobility among family units (Roth et al., 2015; U.S. Department of Health and Human Services, 2020). Barriers in access to care contribute to unmet needs and delayed care (Yamada et al., 2015), which can contribute to adverse outcomes (Jenkins Morales & Robert, 2022). In a systematic review and meta-analysis of unmet long-term care needs among older adults, affordability was the primary barrier to accessing care and the most reported reason for UCN (Rahman et al., 2022).

Numerous studies have found a relationship between formal care use and increased likelihood of UCN (Freedman & Spillman, 2014; Jenkins Morales & Robert, 2022). One study found that those residing at home with ADL needs were primarily dependent upon informal care and reported an average of 38 hours per week of assistance, while those receiving care from a paid caregiver reported an average of 6.5 hours per week of care (Freedman & Spillman, 2014). Among those receiving informal care, 32% had an adverse consequence in the last month related to an unmet need. In contrast, among those with a paid caregiver, almost 60% had an adverse consequence related to an unmet need. This increase in adverse consequences from UCN is likely due to substantial differences in the number of hours of care received. While the likelihood is higher compared to those receiving informal care at home, those residing in residential care settings, such as assisted living communities, are less likely than those receiving paid care at home to have unmet care needs (Freedman & Spillman, 2014; Jenkins Morales & Robert, 2022). Residential care generally provides additional support beyond what may be attainable through paid care at home. For many older adults, especially those with limited financial resources, residential care options are not accessible due to financial constraints (Harris-Kojetin et al., 2019; Pearson et al., 2019).

The Andersen healthcare utilization model (Andersen & Newman, 1973) has been widely used to describe factors associated with older adults' unmet needs for health care (Casado et al., 2011; Fu et al., 2017). This model provides a framework for categorizing factors related to long-term care use as either predisposing, enabling, or need-based. Predisposing variables can include race, age, gender, and education. When assessing unmet LTSS needs, enabling variables can include marital status, living situation, number of children, and type of insurance coverage. Need variables are generally represented by having multiple chronic conditions that contribute to a cognitive or functional impairment that limits one's ability to complete routine activities of daily living on their own. For example, an individual may need care due to chronic pain that prevents moving around the home independently; however, enabling factors such as whether they have long-term care insurance to cover the cost of formal care can contribute to whether needs are met or unmet. Understanding the factors that contribute to UCN and how the presence of UCN may vary by SES can be beneficial in developing policy initiatives aimed at caring for our aging population. At present, little is known about the relationship between SES and UCN.

Predisposing factors

Predisposing factors such as age, race, gender, and education play a significant role in the occurrence of unmet care needs among older adults. Younger cohorts of older adults, specifically those aged 65–74, are more likely to report UCN than their older counterparts (Beach & Schulz, 2017; Freedman & Spillman, 2014). Race and ethnicity have also been associated with UCN, with non-Hispanic whites reported to have lower UCN compared to Blacks and Hispanics (Lima & Allen, 2001; Lin & Liu, 2023). Gender differences also manifest in UCN, with numerous studies indicating that women are more likely than men to report UCN (Chen et al., 2021; LaPlante et al., 2004; Lin & Liu, 2023). The influence of educational attainment on UCN has shown that individuals with lower educational levels have a greater risk of UCN than those with higher education (Albuquerque, 2022; Calderón-Jaramillo & Zueras, 2023).

Enabling Factors

Enabling factors, including marital status, having children, living arrangements, income, and insurance status, influence UCN among older adults. These factors either facilitate access to needed care or create barriers that exacerbate USN. Being married and having children can positively impact the availability of informal care, thus reducing the probability of UCN (Beach & Schulz, 2017; Forden & Ghilarducci, 2023). Similarly, living arrangements are another critical factor, with those living alone having increased odds of UCN due to the absence of immediate, informal support (Beach & Schulz, 2017; Bergh et al., 2023; Desai et al., 2001; Lima & Allen, 2001). Income has also been associated with UCN. Those with higher economic status have been found to have a reduced likelihood of UCN (Albuquerque, 2022), and lower income has been associated with a higher probability of UCN (Desai et al., 2001; Chen et al., 2018). Insurance to assist with the cost of care also plays a crucial role. Those with insurance coverage are more likely to have their care needs met than those with insufficient or no coverage, underscoring the importance of insurance in facilitating access to care (Lima & Allen, 2001).

Need Factors

The relationship between UCN and need factors such as chronic conditions, dementia, and ADL/IADL deficits is well represented in prior research. Older adults with multiple chronic conditions (Beach & Schulz, 2017; Nieuwenhuis et al., 2018), including those with dementia (Fabius et al., 2022), are more likely to have UCN. The risk of having inadequate help grows as the number of ADL and IADL limitations increase (Hyejin et al., 2021; Lima & Allen, 2001), reinforcing the notion that higher levels of disability are directly associated with UCN (Allen et al., 2014; Desai et al., 2001). Prior research found a greater association between UCN and ADL needs compared to IADL needs, suggesting that support networks are less equipped to support care recipients' needs as levels of care increase (Beach & Schulz, 2017).

While the aforementioned predisposing, enabling, and need-related factors have been examined in prior research, little is known about the relationship between the specific interplay of SES and UCN. My research aimed to address this gap and was guided by the following questions: 1) "How does unmet care need differ by socioeconomic status?", and 2) "Are those in the middle class more likely to experience unmet care needs?". My research aimed to identify variations in the relationship between SES and unmet care needs, establishing a foundation for future research.

Methods

Study Design and Participants

This study used cross-sectional data from round nine (2019) of the National Health and Aging Trends Study (NHATS). NHATS data examines trends in late-life disability and social and economic consequences among individuals aged 65 and older in the United States. NHATS is a nationally representative study of older adults across the LTC continuum and includes those residing at home and individuals residing in care facilities. Additional information on the NHATS sampling design and methods is detailed elsewhere (Kasper & Freedman, 2020).

The 2019 round included 4,977 respondents. Individuals with no reported ADL or IADL deficits were excluded (*n*=2407), as were individuals with missing data related to the control variables (*n*=77). The final sample for this study (n=2,493) included individuals age 65 and older with self-reported difficulty performing at least one of the following tasks by themselves: personal-care activities (eating, bathing, toileting, and dressing), household activities (laundry, shopping, meal preparation, and medication management), and mobility activities (going outside, getting around inside, and getting out of bed). These inclusion criteria resulted in a study sample with greater cognitive and functional impairment than the full NHATS sample. It also contributed to the sample being older and having a higher concentration of low-SES participants.

Measures

Socioeconomic Status

The independent variable of interest is SES, presented categorically as low, middle, and upper. The criteria for determining SES differs from one study to another and between various populations, as does the categorization of low, middle, and high-income SES groups. Following the guidance of Grundy and Holt (2001), I opted for a measure of SES based on household income. Participants in the NHATS survey disclose their total household income, including Social Security, Supplemental Security Income, payments from the Veterans Administration, pensions, retirement savings, and earnings from investments. NHATS offers estimated income figures to accommodate participants who either did not disclose their income or did so in ranges only (DeMatteis et al., 2020). In the 2019 data collection, 69% of participants reported their total income, while 18% specified their income in a range (DeMatteis et al., 2020). For 87% of the participants, NHATS formulated a bracketed income figure, and for 13%, NHATS imputed income data (DeMatteis et al., 2020). Owing to NHATS' comprehensive method of collecting income data, household income reliably reflects participants’ SES to examine the relationship with LTSS utilization.

SES income class definitions commonly employ two approaches: 1) segmentation into quintiles, designating the lowest 20% as low-income, the central 60% as middle-income, and the highest 20% as high-income; and 2) classification based on median national household income, with households earning below two-thirds of the median categorized as low-income, those earning between two-thirds and twice the median as middle-income, and those earning above twice the median as high-income (Pressman, 2015; Tyson et al., 2021). I applied the second method in my analysis, referencing the 2019 median national household income of $68,703 (U.S Census Bureau, 2020). The median household income for individuals over 65 in 2019 was only marginally higher, at $70,254 (Administration for Community Living, 2021). Further insights into middle-class definition and measurement are discussed in other works (Elwell, 2014; Kochhar & Sechopoulos, 2022; Pressman, 2015; Tyson et al., 2021). I used SES categories of <$45,803 (low), $45,803-$137,407 (middle), and >$137,407 (high). Additionally, I performed a sensitivity analysis using quintile-based income thresholds of <$28,000 (low), $28,001-$80,000 (middle), and >$80,000 (high) to determine if different thresholds yielded different results.

Unmet Care Needs

The dependent variable of interest is the self-reported occurrence of UCN. Survey participants were asked about their ability to perform ADLs (bathing, dressing, toileting, mobility, and eating) and IADLs (laundry, shopping, meal preparation, and medication management) and whether they performed each activity independently or with assistance. Dichotomous indicators (yes/no) were created for each ADL and IADL, with “yes” representing the activities for which assistance was needed. A dichotomous summary indicator was created to represent any need for assistance across all ADLs and IADLs. Using the same ADL and IADL categories, respondents were asked, “In the last month, did you ever go without [ADL/IADL] because it was too difficult to do by yourself/no one was there to help or do that for you?” Survey participants who reported any of the following due to difficulty or not having someone to help them were identified as having an unmet need: staying inside; not moving around within their home; often staying in bed; going without clean laundry; going without groceries; going without hot meals; not eating; not bathing; not dressing; wearing wet or soiled clothes; or making a mistake taking medicine. UCN was constructed dichotomously (met/unmet) for each ADL and IADL activity, and a dichotomous summary indicator was created to represent any unmet care need.

Control Variables

Control variables included the predisposing, enabling, and need variables identified in the theoretical framework. Predisposing variables included age, gender, race/ethnicity, and educational attainment. Each variable was represented categorically with three age groups (65-74; 75-84; 85 or older); two gender groups (men and women); three race groups (white non-Hispanic; Black non-Hispanic; Hispanic/Other); and four education groups (< high school diploma; high school diploma; 2-4 years of college; > bachelor's degree). Enabling variables included marital status (married/living together; or single/divorced/widowed); children (yes/no); and long-term care coverage, including government funded and private coverage (yes/no). Need was represented by self-reported diagnosis of dementia (yes/no); number of chronic conditions: heart disease, high blood pressure, arthritis, stroke, diabetes, cancer, lung disease, and osteoporosis (0; 1-2; 3 or more); reported limitations related to IADLs of shopping, cooking, medication management, and laundry (0, 1-2; 3 or more); and reported limitations related to ADLs of bathing, dressing, feeding, mobility, and toileting (0, 1-2; 3 or more).

Analysis

Bivariate analyses explored the relationships between SES and UCN and the relationship between SES and control variables. To address the first research question, "How does unmet care need differ by SES?" I used logistic regression models incorporating all SES categories. To address the second research question, "Are those in the middle class more likely to experience unmet care needs?". I used two separate logistic regression models to compare the middle-SES group to the low and upper-SES group. Logistic regression models examined differences by SES and whether those in the middle-SES group were more likely to have UCN. A stepwise approach with backward elimination determined the most significant factors associated with UCN. This process involved iteratively removing variables from the logistic regression model based on their statistical significance, using a p-value threshold of 0.10. This stepwise elimination process ensured that the final logistic regression model included only those variables that were statistically significant and most strongly associated with UCN. This approach is a standard method in statistical analysis to refine models by focusing on the most influential predictors (Bursac et al., 2008; Dunkler et al., 2014). Analyses were conducted in Stata Version 18.0 (Stata Corp., College Station, TX).

Results

Descriptive Summary of Participants

Table 3a presents the descriptive characteristics of the study participants. Just over one-third reported UCN (34.1%). More than two-thirds (67.7%) of participants were in the low-SES group (67.7%), with 27.7% in the middle-SES group and 4.6% in the upper-SES group. About 15% were between 65 and 74 years old, 44.4% were between ages 75 and 84, and 40.2% were aged 85 and above. In terms of racial and ethnic composition, the majority identified as White (66.6%), while Black respondents made up 23.5%, and Other races (i.e., non-White Hispanics, Asian, Native Hawaiin, American Indian) accounted for 9.9%. The sample included more women (62.9%) than men (37.1%), and the majority had children or step-children (91.5%). Regarding marital status, 37.6% of the participants were married or partnered, and 62.4% were single, divorced, never married, or widowed. Educational attainment varied among respondents, with 24.3% not completing high school, about two-thirds having either a high school diploma

(33.7%) or 2-4 years of college (30.6%), and 11.4% having an advanced degree. Just over half (51.9%) reported having no insurance coverage for long-term care. Almost two-thirds (65.2%) reported three or more chronic conditions, with only 2.3% reporting no chronic conditions. A dementia was reported by 15.1% of the study participants. When assessing the need for assistance with ADLs, 18.4% reported no need for assistance, 47.7% required help with one or two ADLs, and 33.9% needed assistance with three or more ADLs. Similarly, for IADLs, 19.1% needed no assistance, 44.8% required help with one or two IADLs, and 19.81% needed help with three or more IADLs.

Bivariate Results: Factors Associated with UCN

Table 3b displays the results of the bivariate analysis and shows an association between SES and UCN ($p = 0.001$); those in the middle and upper-SES group had decreased odds of UCN (OR = 0.72, 95% CI = [0.59, 0.87], and (OR = 0.63, 95% CI = [0.41, 0.96], respectively) compared with those in the low-SES group. Women had 32% higher odds (OR = 1.32, 95% CI = [1.10,1.57]) of UCN compared to men. Black individuals had increased odds of UCN (OR = 1.40, 95% CI = [1.15,1.71]) compared to White individuals. Single individuals had 83% higher odds (OR = 1.83, 95% CI = [1.53, 2.19]) of UCN compared to partnered individuals. Individuals with a high school diploma (OR = 0.71, 95% CI = [0.57,0.88]), those with two to four years of education (OR = 0.70, 95% CI = [0.56,0.88]), and those with more than four years of education (OR = 0.72, 95% CI = [0.54,0.97]) had lower odds of UCN compared to those with less than high school education. Those with insurance had 29% higher odds (OR = 1.29, 95% CI = [1.09,1.53] of UCN than those without insurance. Those with dementia had higher odds of UCN (OR = 2.29, 95% CI = [1.84,2.86]). Participants who needed assistance with one or two ADLs had higher odds of UCN (OR = 1.87, 95% CI = [1.38-2.55]), with odds increasing substantially for those with three or more ADL needs (OR = 12.21, 95% CI = [8.96,16.64]). Similarly, those needing assistance with one or two IADLs had higher odds of UCN (OR = 3.14, 95% CI = [2.25,4.39]), with odds increasing substantially for those with three or more IADL needs (OR = 13.09, 95% CI = [9.39,18.24]). Age showed no significant association with UCN in the bivariate analysis, nor did being Hispanic/Other, having children, or having chronic illnesses.

Logistic Regression Analysis of Factors Associated with UCN

Table 3c presents the unadjusted and adjusted odds of having UCN, comparing all SES groups. The goodness of fit for both the unadjusted and adjusted models was assessed using the Pearson chi-squared test. The unadjusted model explained 21.6% of the variability in UCN (Pseudo R^2 = 0.2162), and the goodness-of-fit test indicated an adequate fit of the model to the observed data (Pearson chi2(1674) = 1697.41, Prob > chi2 = 0.3393). The adjusted model resulted in a minimal reduction in the Pseudo R^2 value (0.214), and the model's goodness-of-fit test showed an acceptable fit (Pearson chi2(247) = 281.66, Prob > chi2 = 0.064). The adjusted model was more parsimonious, reflecting a more concise set of predictors without compromising the model's overall fit. In the adjusted model, participants in the middle-SES group had a 29% increase in the odds of having UCN compared to those in the low-SES group (OR = 1.29, 95% CI = [1.01-1.63], p = .037). Having children (OR = 1.46, 95% CI = [1.02, 2.08], p = 0.037) and being single (OR = 1.64, 95% CI =[1.31,2.05], $p < 0.001$) were also associated with increased UCN. Additionally, individuals with ADL and IADL difficulties exhibited higher odds of UCN, with the odds increasing alongside the number of reported difficulties (OR ranges from 2.47, 95% CI [1.79,3.42], $p < 0.001$ to 9.68, 95% CI [6.85,13.68], $p < 0.001$ for ADL difficulties and from 3.63, 95% CI [2.55,5.17], $p < 0.001$ to 6.44, 95% CI = [4.47,9.28], $p < 0.001$ for IADL difficulties). Age and having only one or two chronic illnesses were associated with lower odds of UCN. Participants in older age groups (75-84 and 85+) had lower odds of UCN (OR = 0.73, 95% CI = [0.55,0.98], *p* = 0.036 and OR = 0.59, 95% CI = [0.44,0.79], *p* < .001, respectively) compared to those aged 65-74. Similarly, individuals with one or two chronic illnesses had lower odds of UCN (OR = 0.72, 95% CI = [0.58,0.89], *p* = 0.002) compared to those with no chronic illnesses. No significant associations were observed between race and ethnicity, gender, educational attainment, insurance status, or a diagnosis of dementia and UCN.

Logistic Regression Analysis of Factors Associated with UCN Comparing SES Groups

Table 3d presents the unadjusted and adjusted odds of UCN, separately comparing those in the middle-SES group to those in the low and upper-SES groups. The goodness of fit for both the unadjusted and adjusted models was assessed using the Pearson chi-squared test. The unadjusted model explained 22% of the variability in UCN (Pseudo R^2 = 0.2200), and the goodness-of-fit test indicated an adequate fit of the model to the observed data (Pearson chi2(1576) = 1592.68, Prob > chi2 = 0.3791). The adjusted model resulted in a minimal reduction in the Pseudo R^2 value (0.219), and the model's goodness-of-fit test showed an acceptable fit (Pearson chi2(244) = 269.38, Prob > chi2 = 0.1269). The adjusted model was more parsimonious, reflecting a more concise set of predictors without compromising the model's overall fit. In comparing the middle-SES group to those in the low-SES group, those in the middle-SES group had increased odds of UCN (OR = 1.36, 95% CI [1.06,1.73], *p*=0.014). Other factors significantly associated with increased odds of UCN included having children (OR = 1.46, 95% CI [1.02,2.10], *p*=0.040), being single (OR = 1.74, 95% CI [1.37,2.20], *p* < 0.001), and having ADL or IADL needs, with UCN increasing as the number of ADL or IADL needs increased. Odds of UCN was more than twice as high among those with 1-2 ADL needs (OR = 2.63, 95% CI [1.87,3.71], *p* < 0.001) and more than ten times higher among those with three or more ADL needs (OR =10.27, 95% CI [7.14,14.76], $p < 0.001$), compared to those with no ADL needs. For IADLs, those with 1-2 IADL needs had odds more than three times higher than those with no IADL needs (OR = 3.51, 95% CI [2.44,5.03], $p < 0.001$) and for those with three or more IADL needs odds were more than six times higher than those with no IADL needs (OR = 6.50, 95% CI [4.47,9.46], $p < 0.001$). Factors associated with decreased odds of UCN included age, with odds for those aged 85+ (OR = 0.57, 95% CI [0.42,0.78], $p < 0.001$) lower than those aged 75-84 (OR = 0.70, 95% CI [0.52,0.94], $p = 0.019$), compared to those aged 65-74; and having 1-2 chronic illnesses (OR = 0.71, 95% CI [0.57,0.89], p=0.003) compared to those having no chronic illnesses.

In the comparison of the middle-SES group to those in the upper-SES group, the unadjusted model explained 21.5% of the variability in UCN (Pseudo $R^2 = 0.2153$), and the goodness-of-fit test indicated an adequate fit of the model to the observed data (Pearson chi2(602) = 609.06, Prob > chi2 = 0.4122). The adjusted model resulted in a minimal reduction in the Pseudo R^2 value (0.2083), and the model's goodness-of-fit test showed an acceptable fit (Pearson chi2(69) = 73.71, Prob > chi2 = 0.3267). The adjusted model was more parsimonious, reflecting a more concise set of predictors without compromising the model's overall fit. In the adjusted model, SES had no significant association with UCN. Single individuals had increased odds of UCN (OR = 1.71, 95% CI [1.17,2.51], $p = 0.005$). Other factors associated with increased odds of UCN included having any ADL or IADL needs. As ADL and IADL needs increased, the odds of UCN increased. For those with only 1-2 ADL needs, the OR was 1.63 (95% CI [1.00,2.66]; $p = 0.048$), and for those with three or more ADL needs, the OR was 7.76 (95% CI [4.42,13.62]; $p < 0.001$). The OR for those with 1-2 IADL needs was 3.76 (95% CI [2.13,6.62], $p < 0.001$), and for those with three or more IADL needs, the OR was 6.41 (95% CI [3.49,11.78], p

< 0.001). Participants aged 85+ had lower odds of UCN than those aged 65-74 (OR = 0.69, 95% CI [0.47,1.02], *p*=0.069). Those in the Hispanic/Other race category had decreased odds of UCN compared to Whites (OR = 0.33, 95% CI [0.10,1.06], *p*=0.064). Having children showed no significant association with UCN compared to the middle and upper-SES groups. Those with 1-2 chronic illnesses had lower odds of UCN (OR = 0.63, 95% CI [0.44,0.92], *p* =0.016) compared to those with no chronic illnesses.

Sensitivity Analysis

The results of a sensitivity analysis using the quintile approach for measuring SES, not shown, yielded slightly different results. In both the overall SES comparison and the comparisons of middle-SES versus low and upper-SES, no significant association was found between SES and UCN. In all of the comparisons, having more than four years of college increased the odds of UCN. This finding was not significant in the original analyses. All other findings were similar to the results of the original analyses.

Discussion

My research addressed two questions. In response to the first question, how does unmet care need differ by socioeconomic status: about one-third of the study participants reported having an unmet care need, irrespective of SES. Those in the middle-SES group had increased odds of UCN. This finding suggests a care gap for those not eligible for LTSS public assistance programs such as Medicaid while also lacking the means to afford out-of-pocket care services available to those in higher-SES groups. This finding is of particular interest given that prior research has found that low-SES groups have a greater likelihood of UCN due to their propensity toward poorer overall health status and increased levels of disability (Hyejin et al., 2021). My findings suggest that despite this propensity, those in the low-SES group may benefit from public assistance programs or other resources unavailable to those in the middle-SES group, providing a protective barrier from UCN. The association between the family dynamics of marital status and having children presented conflicting results related to the role of informal support networks in influencing care outcomes and UCN. While the association between being single and having increased odds of UCN aligns with prior research (Beach & Schulz, 2017; Forden & Ghilarducci, 2023), the finding that having children was associated with increased odds of UCN was unexpected and warrants further examination. Several factors could influence this association, including expectations and perceptions, caregiver burden and availability, family dynamics, and complexity of care needs. Another finding in contrast with prior research is the association between increased age and decreased odds of UCN. Given the focus on SES, it is possible that the age-related differential impact across SES groups could be attributed to those in the low-SES group having earlier onset of health-related issues that could cause their UCN to peak at a younger age. In relation to need-based factors, my findings align with previous research showing that the odds of UCN increase substantially as the severity of ADL and IADL limitations increase (Allen et al., 2014; Beach et al., 2020; Desai et al., 2001; Hyejin et al., 2021). The greater the complexity and intensity of an individual's needs, the more likely they are to exceed the capacity of the existing support structure (Beach et al., 2020). If their informal care network is unequipped to support their needs, it could increase reliance on formal care options. If adequate formal care is not affordable, older adults risk having their care needs unmet.

In response to the second research question, are those in the middle class more likely to experience UCN: the comparisons of the middle-SES group to the lower-SES group yielded results aligned with those from the first research question. Slight differences emerged in the comparison of the middle-SES group to the upper-SES group. In that comparison, income showed no significant association. This finding suggests that compared to the low-SES group, income presents a barrier to meeting care needs, but compared to the upper-SES group, factors other than income are attributable to the differences in UCN. In the comparison of the middle and upper-SES groups, an association between those in the Hispanic/Other race category and decreased odds of having UCN was found. This factor showed no association in the other comparisons. In this study, the majority of this category was Hispanic. The Hispanic culture emphasizes familism and filial support (Miyawaki, 2016), and research has shown that as needs increase, informal support may not be adequate (Beach & Schulz, 2017). Prior research found Hispanics to have the highest rate of UCN (Lin & Liu, 2023). The presence of an association when comparing the middle and upper-SES groups but not the middle and lower-SES groups warrants further examination. Another key difference in this comparison was the lack of association between having children and UCN. This finding suggests that those in the upper-SES group might have access to other resources and support systems independent of their adult children. All other factors yielded similar results to the other comparisons.

The sensitivity analysis using the percentile approach for delineating low, middle, and upper-income bands of SES showed no association between SES and UCN. This finding reinforces the importance of considering differing methodological approaches to measuring SES when comparing results across studies.

Implications

It is useful to understand if SES is associated with UCN and to determine whether certain SES groups experience more adversities related to these unmet needs. Determining if an association exists between SES and unmet needs in later life, and which demographic is most likely to experience unmet needs, can inform future policy initiatives to provide appropriately targeted interventions. The middle class is often underrepresented in research, and my study contributes to the sparse literature examining the later life experiences of this demographic.

My findings highlight a potential care gap for those in the middle-SES group resulting in increased odds of UCN. This suggests a need for policy adjustments and service provisions that specifically address the needs of older adults in the middle-SES group who may face financial barriers in accessing care not encountered by those in the other SES brackets. The unexpected finding related to increased odds of UCN among those with children highlights the need for future research exploring the dynamics of adult children as caregivers. In addition, longitudinal studies would help understand the differential impact of age across SES groups and why UCN might decrease with age. The most pronounced associations were among those with ADL and IADL needs. These associations persisted for both the middle and upper-SES groups, with odds of UCN substantially higher among these groups compared to the low-SES group. This finding warrants further examination of whether public assistance programs for low-income groups provide a protective buffer from UCN. It also warrants further research to examine the role of informal care networks and UCN, especially if informal caregivers struggle to meet the needs of those with more impairments.

The exploratory nature of my research establishes a foundation for future research opportunities more so than supporting specific policy recommendations. Further analysis of the adequacy of existing support systems for the middle class and their challenges in accessing long-term care seems warranted. My research also highlights the importance of considering a multifaceted approach when addressing the care needs of older adults, taking into account the complexity of factors that influence their needs and care utilization patterns.

Strengths and Limitations

My study contributes to sparsely represented research on SES and UCN in later life, filling a crucial gap by focusing on the middle class. Other researchers have used NHATS to examine UCN using income as a control or confounding variable (Beach et al., 2020; Kasper et al., 2014; Lin & Liu, 2023), but I am not aware of any that have examined SES as the key independent variable. Including predisposing, enabling, and need factors as control variables contributed to a more accurate assessment of the relationship. Furthermore, logistic regression with backward elimination provides a robust statistical analysis, ensuring that the final results include only the most relevant variables. In addition, individual models comparing the middle-SES group to those in the low and upper-SES groups provided additional detail that would have been lost by combining the distinctly different upper and lower-SES groups into one referent category. The findings from my study provide a foundation for future research on a segment of older adults currently under-represented in long-term care research. Future research opportunities should evaluate the relationship between SES and UCN over time to provide insights into how these relationships evolve as individuals' circumstances change. In addition, qualitative research can provide a deeper understanding of the reasons for UCN. Interviews or focus groups with older adults and their families could uncover nuanced factors influencing their choices. A mixed-methods approach would allow for triangulating findings and strengthening the overall study conclusions.

While not a limitation but necessary for addressing the research question, given the focus on UCN related to ADL and IADL needs, it was necessary to limit the study sample to include only those who reported having an ADL or IADL need. This inclusion criteria resulted in a study sample with greater cognitive and functional impairment than the full NHATS sample. The inclusion criteria also contributed to the sample being older and having a higher concentration of low-SES participants. This is representative of the population likely to experience UCN, and as such, the results are generalizable only to those with ADL/IADL needs. It is important to consider this in relation to the results.

My research employed a cross-sectional analysis, which does not determine causality or capture changes that occur over time. The latter is critical when studying an older demographic in a transitional state of need. NHATS relies on self-reported data. For key factors such as ADL and IADL needs and corresponding unmet needs, participants may have under-reported or over-reported their needs, contributing to social desirability bias. My study did not explore differences in the number of UCN or types of UCN, which could yield additional variations in the results by SES group. Despite controlling for predisposing, enabling, and need factors previously established in literature in this field of research, there may still be unobserved factors that influence UCN, resulting in potential omitted variable bias. Lastly, considerable variability in how SES is measured exists across different studies. This variability can complicate comparisons across studies and may affect the consistency of findings, as noted in the sensitivity analysis results. These limitations should guide future research to build upon this exploratory foundation.

Conclusion

This study offers insights into the dynamics between SES and UCN among older adults, highlighting how SES interacts with various factors such as age, family structure, and ADL/IADL needs impacting whether care needs are met. While those in the middle-SES group had increased odds of having UCN, my research identified several factors associated with UCN regardless of SES. Future research should continue to explore these influences, aiming to develop a more equitable long-term care support system that recognizes and accommodates our aging population's diverse needs and preferences.

References

Administration for Community Living. (2021). 2020 Profile of older Americans. U.S. Department of Health and Human Services. https://acl.gov/sites/default/files/Aging%20and%20Disability%20in%20America/2020ProfileOlderAmericans.Final_.pdf

Albuquerque, P. C. (2022). Met or unmet need for long-term care: Formal and informal care in southern Europe. *The Journal of the Economics of Ageing, 23*(C). DOI: 10.1016/j.jeoa.2022.100409

Allen, S. M., Piette, E. R., & Mor, V. (2014). The adverse consequences of unmet need among older persons living in the community: dual-eligible versus Medicare-only beneficiaries. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *69* (Supplement_1), S51–S58. https://doi.org/10.1093/geronb/gbu124

Andersen, R., & Newman, J. F. (1973). Societal and individual determinants of medical care utilization in the United States. *The Milbank Memorial Fund Quarterly. Health and Society*, *51*(1), 95–124.

Beach, S. R., & Schulz, R. (2017). Family caregiver factors associated with unmet needs for care of older adults. *Journal of the American Geriatrics Society*, *65*(3), 560–566. https://doi.org/10.1111/jgs.14547

Beach, S. R., Schulz, R., Friedman, E. M., Rodakowski, J., Martsolf, R. G., & James, A. E. (2020). Adverse consequences of unmet needs for care in high-need/high-cost older adults. *The Journals of Gerontology: Series B, Psychological Sciences and Social Sciences, 75*(2), 459–470. https://doi.org/10.1093/geronb/gby021

Bergh, M., Raval, A., & Travers, J. (2023). Supporting older adults who live alone: Understanding their unmet needs using NHATS survey data. *Innovation in Aging, 7*(Supplement_1), 693–694. https://doi.org/10.1093/geroni/igad104.2251

Bursac, Z., Gauss, C. H., Williams, D. K., & Hosmer, D. W. (2008). Purposeful selection of variables in logistic regression. *Source Code for Biology and Medicine*, *3*(1), 17–17. https://doi.org/10.1186/1751-0473-3-17

Calderón-Jaramillo, M., & Zueras, P. (2023). Cared and uncared populations: Understanding unmet care needs of older adults (65+) across different social care systems in Europe. *European Journal of Ageing, 20*(1), 11. https://doi.org/10.1007/s10433-023-00760-3

Casado, B. L., van Vulpen, K. S., & Davis, S. L. (2011). Unmet needs for home and community-based services among frail older Americans and their caregivers. *Journal of Aging and Health*, *23*(3), 529–553. https://doi.org/10.1177/0898264310387132

Chen, N., Li, X., Deng, M., Wang, C. Q., & Zhou, C. (2021). Gender difference in unmet need for assistance with activities of daily living among disabled seniors in China : A cross-sectional study. *BMJ open*, *11*(6), e044807. https://doi.org/10.1136/bmjopen-2020-044807

Chen, S., Zheng, J., Chen, C., Xing, Y., Cui, Y., Ding, Y., & Li, X. (2018). Unmet needs of activities of daily living among a community-based sample of disabled elderly people in Eastern China: a cross-sectional study. *BMC Geriatrics*, 18. https://doi.org/10.1186/s12877-018-0856-6.

DeMatteis, J., Freedman,V., Kasper, J., and Jiao, R. (2020). National Health and Aging Trends Study Round 9 Income Imputation. *NHATS Technical Paper #27*. Johns Hopkins University School of Public Health.

Desai, M. M., Lentzner, H. R., & Weeks, J. D. (2001). Unmet need for personal assistance with activities of daily living among older adults. *The Gerontologist, 41*(1), 82–88. https://doi.org/10.1093/geront/41.1.82

Dunkler, D., Plischke, M., Leffondré, K., & Heinze, G. (2014). Augmented backward elimination: a pragmatic and purposeful way to develop statistical models. *PloS One*, *9*(11), e113677–e113677. https://doi.org/10.1371/journal.pone.0113677

Elwell, C. (2014). The Distribution of Household Income and the Middle Class. Washington, DC: Congressional Research Service. https://fas.org/sgp/crs/misc/RS20811.pdf

Fabius, C. D., Okoye, S. M., Mulcahy, J., Burgdorf, J. G., & Wolff, J. L. (2022). Associations Between Use of Paid Help and Care Experiences Among Medicare-Medicaid Enrolled Older Adults With and Without Dementia. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *77*(12), E216–E225. https://doi.org/10.1093/geronb/gbac072

Fitzpatrick, A. L., Powe, N. R., Cooper, L. S., Ives, D. G., & Robbins, J. A. (2004). Barriers to health care access among the elderly and who perceives them. *American Journal of Public Health*, *94*(10), 1788–1794. https://doi.org/10.2105/ajph.94.10.1788

Forden, J., & Ghilarducci, T. (2023). U.S. Caregiving System Leaves Significant Unmet Needs Among Aging Adults. *Economic Policy Research Institute.* https://www.economicpolicyresearch.org/images/Retirement_Project/Policy_Notes/2023/December_Caregiving/Unmet_Care_Needs_Among_Aging_Adults.pdf

Freedman,V.A., & Spillman, B.C. (2014). Disability and care needs among older Americans. *Milbank Quarterly, 92: 509-541*. https://doi.org/10.1111/1468-0009.12076

Fu, Y. Y., Guo, Y., Bai, X., & Chui, E. W. (2017). Factors associated with older people's long-term care needs: A case study adopting the expanded version of the Anderson Model in China. *BMC Geriatrics*, *17*(1), 38. https://doi.org/10.1186/s12877-017-0436-1

Grundy, E., & Holt, G. (2001). The socioeconomic status of older adults: how should we measure it in studies of health inequalities? *Journal of Epidemiology and Community Health*, 55(12), 895–904. https://doi.org/10.1136/jech.55.12.895

Harris-Kojetin, L., Sengupta, M., Lendon, J. P., Rome, V., Valverde, R., & Caffrey, C. (2019). *Long-term care providers and services users in the United States, 2015–2016*. https://www.cdc.gov/nchs/nsltcp/index.htm

Horstman, C., Gumas, E. D., & Jacobson, G. (2023). U.S. and Global Approaches to Financing Long-Term Care: Understanding the Patchwork. Commonwealth Fund. Retrieved from https://www.commonwealthfund.org/publications/issue-briefs/2023/feb/us-global-financing-long-term-care-patchwork

Hyejin, L., Bumjo, O., Sunyoung, K., & Kiheon, L. (2021). ADL/ IADL dependencies and unmet healthcare needs in older persons: A nationwide survey.. *Archives of Gerontology and Geriatrics*, 96, 104458 . https://doi.org/10.1016/j.archger.2021.104458.

Jenkins Morales, M., & Robert, S. A. (2022). Examining consequences related to UCNs across the long-term care continuum. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *77,* Suppl 1, S63–S73. https://doi.org/10.1093/geronb/gbab210

Kasper, J., & Freedman, V. (2020). National Health and Aging Trends Study User Guide: Rounds 1-9 Final Release. Baltimore: Johns Hopkins University School of Public Health. https://nhats.org/sites/default/files/2021-04/NHATS_User_Guide_R9_Final_Release_0.pdf

Kemper, P. (1992). The use of formal and informal home care by the disabled elderly. *Health Services Research*, *27*(4), 421. https://link.gale.com/apps/doc/A13528540/AONE?u=char69915&sid=bookmark-AONE&xid=c3f7962e

Kochhar, R., & Sechopoulos, S. (2022). How the American Middle Class has changed in the past five decades. Pew Research Center. https://www.pewresearch.org/short-reads/2022/04/20/how-the-american-middle-class-has-changed-in-the-past-five-decades/

LaPlante, M. P., Kaye, H. S., Kang, T., & Harrington, C. (2004). Unmet need for personal assistance services: estimating the shortfall in hours of help and adverse consequences. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *59*(2), S98–S108. https://doi.org/10.1093/geronb/59.2.s98

Lima, J., & Allen, S. (2001). Targeting risk for unmet need: Not enough help versus no help at all. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *56*(5), S302–S310. https://doi.org/10.1093/geronb/56.5.S302

Lin, Z., & Liu, H. (2023). Race/Ethnicity, Nativity, and Gender Disparities in Unmet Care Needs among Older Adults in the United States. *The Gerontologist*, gnad094. Advance online publication. https://doi.org/10.1093/geront/gnad094

McMaughan, D. J., Oloruntoba, O., & Smith, M. L. (2020). Socioeconomic Status and Access to Healthcare: Interrelated Drivers for Healthy Aging. *Frontiers in Public Health*, *8*, 231. https://doi.org/10.3389/fpubh.2020.00231

Miyawaki, C. E. (2016). Caregiving practice patterns of Asian, Hispanic, and non-Hispanic white American family caregivers of older adults across generations. *Journal of Cross-Cultural Gerontology, 31*(1), 35–55. https://doi.org/10.1007/s10823-016-9281-5

Mommaerts, C. (2018). Are coresidence and nursing homes substitutes? Evidence from Medicaid spend-down provisions. *Journal of Health Economics*, *59*, 125–138. https://doi.org/10.1016/j.jhealeco.2018.04.003

Nieuwenhuis, A. V., Beach, S. R., & Schulz, R. (2018). Care Recipient Concerns About Being a Burden and Unmet Needs for Care. *Innovation in Aging*, *2*(3), igy026. https://doi.org/10.1093/geroni/igy026

Pearson, C. F., Quinn, C. C., Loganathan, S., Datta, A. R., Mace, B. B., & Grabowski, D. C. (2019). The Forgotten Middle: Many middle-income seniors will have insufficient resources for housing and health care. *Health Affairs*, *38*(5), 101377. https://doi.org/10.1377/hlthaff.2018.05233

Pressman, S. (2015). Defining and Measuring the Middle Class. American Institute of Economic Research. https://www.aier.org/wp-content/uploads/2016/10/WP007-Middle-Class.pdf

Rahman, M., Rosenberg, M., Flores, G., Parsell, N., Akter, S., Alam, M. A., & Edejer, T. (2022). A systematic review and meta-analysis of unmet needs for healthcare and long-term care among older people. *Health Economics Review*, *12*(1), 60–60. https://doi.org/10.1186/s13561-022-00398-4

Roth, D. L., Fredman, L., & Haley, W. E. (2015). Informal caregiving and its impact on health: A reappraisal from population-based studies. *The Gerontologist*, *55*(2), 309–319. https://doi.org/10.1093/geront/gnu177

Schulz, R., & Tompkins, C. (2010). Informal Caregivers in the United States: Prevalence, Caregiver Characteristics, and Ability to Provide Care. The Role of Human Factors in Home Health Care: Workshop Summary. Washington (DC): National Academies Press. https://www.ncbi.nlm.nih.gov/books/NBK210048/

Scommenga, P., & Sherburne, M. (2022). Vulnerable older Americans aren't getting adequate care. Population Reference Bureau. https://www.prb.org/resources/vulnerable-older-americans-arent-getting-adequate-care-even-with-paid-caregivers-or-grown-children/

Tyson, A., Funk, C., Kennedy, B., & Johnson, C. (2021). *Methodology*. Pew Research Center Science & Society. https://www.pewresearch.org/science/2021/09/15/covid19-restrictions-methodology/

U.S. Census Bureau. (2020). Income and Poverty in the United States: 2019. Census.Gov. https://www.census.gov/library/publications/2020/demo/p60-270.html

U.S. Department of Health and Human Services. (2020). *Informal Caregiver Supply and Demographic Changes*. Office of the Assistant Secretary for Planning and Evaluation. https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//198051/ICSupplyLR.pdf

Van Houtven, C. H., & Norton, E. C. (2004). Informal care and health care use of older adults. *Journal of Health Economics, 23*(6), 1159-1180. https://doi.org/10.1016/j.jhealeco.2004.04.008

West, J., & Dubay, L. (2019). Middle-income seniors face a gap in housing and health supports. Urban Institute. https://www.urban.org/urban-wire/middle-income-seniors-face-gap-housing-and-health-supports

Yamada, T., Chen, C. C., Murata, C., Hirai, H., Ojima, T., Kondo, K., & Harris, J. R., 3rd (2015). Access disparity and health inequality of the elderly: Unmet needs and delayed healthcare. *International Journal of Environmental Research and Public Health*, *12*(2), 1745–1772. https://doi.org/10.3390/ijerph120201745

Table 3a. Demographic and Functional Characteristics of Study Participants (*n*=2493)

Variable	Category	Frequency (n)	Percentage (%)
Unmet Care Needs	No	1642	65.9%
	Yes	851	34.1%
SES	Low	1687	67.7%
	Middle	690	27.7%
	Upper	116	4.6%
Age Group	65-74	385	15.4%
	75-84	1106	44.4%
	85+	1002	40.2%
Race/Ethnicity	White	1660	66.6%
	Black	586	23.5%
	Hispanic/Other	247	9.9%
Gender	Male	924	37.1%
	Female	1569	62.9%
Children	No	211	8.5%
	Yes	2282	91.5%
Marital Status	Married	938	37.6%
	Single	1555	62.4%
Education	< High School	605	24.3%
	High School/Trade	839	33.7%
	2-4 yrs	764	30.6%
	> 4 yrs	285	11.4%
Insurance	No	1293	51.9%
	Yes	1200	48.1%
Dementia	No	2116	84.9%
	Yes	377	15.1%
Chronic Illness	None	58	2.3%
	1-2	810	32.5%
	3+	1625	65.2%
ADL	None	459	18.4%
	1-2	1190	47.7%
	3+	844	33.9%
IADL	None	477	19.1%
	1-2	1117	44.8%
	3+	899	36.1%

Note: ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living).

Table 3b. Bivariate Analysis of Socio-demographic Factors and Unmet Care Needs (*n*=2493)

Variable	**Category**	**Met Need** *n*=**1642**	**Unmet Need** *n*=**851**	**Total** *n*=**2493**	**Pearson Chi2 P-value**	**Odds Ratio (95% CI)**
SES	Low	1069(63.37%)	618(36.63%)	1687	**14.76(0.001**)	Ref
	Middle	488(70.72%)	202(29.28%)	690		**0.72(0.59-0.87)**
	Upper	85(73.28%)	31(26.72%)	116		**0.63(0.41-0.96)**
Age Group	65-74	256(66.49%)	129(33.51%)	385	**9.19(0.010)**	Ref
	75-84	760(68.72%)	346(31.28%)	1106		**0.90(0.71-1.15)**
	85+	626(62.48%)	376(37.52%)	1002		**1.19(0.93-1.52)**
Race/Ethnicity	White	1129(68.01%)	531(31.99%)	1660	**11.78(0.003)**	Ref
	Black	353(60.24%)	233(39.76%)	586		1.40(1.15-1.71)
	Hispanic/ Other	160(64.78%)	87(35.22%)	247		1.15(0.87-1.53)
Gender	Male	644(69.70%)	280(30.30%)	924	**9.59(0.002)**	Ref
	Female	998(63.61%)	571(36.39%)	1569		1.32(1.10-1.57)
Children	No	146(69.19%)	65(30.81%)	211	1.13(0.286)	Ref
	Yes	1496(65.56%)	786(34.44%)	2282		1.18(0.87-1.60)
Marital Status	Married	695(74.09%)	243(25.91%)	938	**45.29(0.000)**	Ref
	Single	947(60.90%)	608(39.10%)	1555		1.83(1.53-2.19)
Education	< HS	362(59.83%)	243(40.17%)	605	**12.94(0.005)**	Ref
	HS/Trade	569(67.82%)	270(32.18%)	839		0.71(0.57-0.88)
	2-4 yrs	519(67.93%)	245(32.07%)	764		0.70(0.56-0.88)
	> 4 yrs	192(67.37%)	93(32.63%)	285		0.72(0.54-0.97)
Insurance	No	888(68.68%)	405(31.32%)	1293	**9.45(0.002)**	Ref
	Yes	754(62.83%)	446(37.17%)	1200		1.29(1.09-1.53)
Dementia	No	1457(68.86%)	659(31.14%)	2116	**55.71(0.000)**	Ref
	Yes	185(49.07%)	192(50.93%)	377		2.29(1.84-2.86)
Chronic Illness	None	41(70.69%)	17(29.31%)	58	**35.84(0.000)**	Ref
	1-2	598(73.83%)	212(26.17%)	810		0.86(0.48-1.54)
	3+	1003(61.72%)	622(38.28%)	1625		1.49(0.84-2.66)
ADL	None	401(87.36%)	58(12.64%)	459	**512.69(0.000)**	Ref
	1-2	936(78.66%)	254(21.34%)	1190		1.87(1.38-2.55)
	3+	305(36.14%)	539(63.86%)	844		12.21(8.96-16.64)
IADL	None	431(90.36%)	46(9.64%)	477	**400.55(0.000)**	Ref
	1-2	836(74.84%)	281(25.16%)	1117		3.14(2.25-4.39)
	3+	375(41.71%)	524(58.29%)	899		13.09(9.39-18.24)

Note: ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living). A p-value threshold of < 0.10 was considered statistically significant.

Table 3c. Odds Ratios (OR) for Factors Associated with Unmet Care Need Comparing All SES Categories (*n*=2493)

		Unadjusted		**Adjusted**	
Variable	**Category**	**Odds Ratio (95% CI)**	**P-value**	**Odds Ratio (95% CI)**	**P-value**
SES	Low	Ref	Ref	Ref	Ref
	Middle	1.24(0.95-1.62)	0.107	**1.29(1.01-1.63)**	**0.037**
	Upper	1.31(0.76-2.24)	0.329	1.29(0.79-2.11)	0.303
Age Group	65-74	Ref	Ref	Ref	Ref
	75-84	**0.74(0.55-0.99)**	**0.047**	**0.73(0.55-0.98)**	**0.036**
	85+	**0.59(0.44-0.81)**	**0.001**	**0.59(0.44-0.79)**	**0.000**
Race/Ethnicity	White	Ref	Ref	Ref	Ref
	Black	1.07(0.84-1.38)	0.581	–	–
	Hispanic/Other	0.92(0.65-1.30)	0.639	–	–
Gender	Male	Ref	Ref	Ref	Ref
	Female	0.95(0.76-1.19)	0.649	–	–
Children	No	Ref	Ref	Ref	Ref
	Yes	**1.50(1.05-2.14)**	**0.025**	**1.46(1.02-2.08)**	**0.037**
Marital Status	Married	Ref	Ref	Ref	Ref
	Single	**1.71(1.35-2.18)**	**0.000**	**1.64(1.31-2.05)**	**0.000**
Education	< HS	Ref	Ref	Ref	Ref
	HS/Trade	0.96(0.73-1.26)	0.774	–	–
	2-4 yrs	1.10(0.82-1.47)	0.522	–	–
	> 4 yrs	1.26(0.85-1.88)	0.247	–	–
Insurance	No	Ref	Ref	Ref	Ref
	Yes	0.94(0.77-1.14)	0.524	–	–
Dementia	No	Ref	Ref	Ref	Ref
	Yes	0.93(0.71-1.22)	0.603	–	–
Chronic Illness	None	Ref	Ref	Ref	Ref
	1-2	0.58(0.30-1.15)	0.117	**0.72(0.58-0.89)**	**0.002**
	3+	0.82(0.42-1.61)	0.568	1.35(1.09-1.66)	0.005
ADL	None	Ref		Ref	
	1-2	**2.54(1.83-3.53)**	**0.000**	**2.47(1.79-3.42)**	**0.000**
	3+	**10.15(7.13-14.46)**	**0.000**	**9.68(6.85-13.68)**	**0.000**
IADL	None	Ref	Ref	Ref	Ref
	1-2	**3.67(2.57-5.22)**	**0.000**	**3.63(2.55-5.17)**	**0.000**
	3+	**6.68(4.60-9.69)**	**0.000**	**6.44(4.47-9.28)**	**0.000**

Note: ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living). The outcome variable 'Unmet Care Need' is coded 1 for Yes and 0 for No. A p-value threshold of < 0.10 was considered statistically significant.

Table 3d. Odds Ratios (OR) for Factors Associated with Unmet Care Need Comparing Middle to Low-SES and Middle to Upper-SES

	Middle Vs Low (n=2377)		Middle Vs Upper (n=806)	
Variable	**UOR(95% CI), p-value**	**AOR(95% CI), p-value**	**UOR(95% CI) p-value**	**AOR(95% CI), p-value**
SES (Middle Vs Low)	1.27(0.97-1.66), 0.077	**1.36(1.06-1.73), 0.014**	**	**
SES (Middle Vs Upper)	**	**	1.02(0.59-1.74), 0.95	—
Age (Ref: 65-74)	Ref	Ref	Ref	Ref
75-84	0.71(0.52-0.95), 0.023	**0.70(0.52-0.94), 0.019**	1.04(0.63-1.71), 0.881	1.32(0.91-1.90), 0.144
85+	0.58(0.43-0.79), 0.001	**0.57(0.42-0.78), 0.000**	0.69(0.69-1.18), 0.176	**0.69(0.47-1.02), 0.069**
Race (Ref: White)	Ref	Ref	Ref	Ref
Black	1.07(0.84-1.38), 0.572	—	0.72(0.39-1.32), 0.287	0.79(0.43-1.45), 0.455
Hispanic/Other	0.91(0.64-1.29), 0.610	—	0.31(0.09-1.00), 0.050	**0.33(0.10-1.06), 0.064**
Gender (Ref: Men)	0.97(0.77-1.22), 0.827	—	1.30(0.88-1.91), 0.18	—
Child (Ref: No)	1.49(1.04-2.15), 0.030	**1.46(1.02-2.10), 0.040**	1.08(0.53-2.18), 0.837	—
Marital Status (Ref: Married)	1.73(1.35-2.22), 0.000	**1.74(1.37-2.20), 0.000**	1.64(1.09-2.45), 0.016	**1.71(1.17-2.51), 0.005**
Education (Ref: <HS)	Ref	Ref	Ref	Ref
HS/Trade	0.95(0.72-1.26), 0.743	—	0.63(0.26-1.54), 0.311	—
2-4 yrs	1.11(0.83-1.49), 0.479	—	0.89(0.38-2.10), 0.798	—
> 4 yrs	1.18(0.78-1.79), 0.426	—	1.02(0.42-2.48), 0.958	—
Insurance (Ref: No)	0.93(0.76-1.14), 0.488	—	0.91(0.64-1.31), 0.624	—
Dementia (Ref: No)	0.91(0.69-1.19), 0.496	—	1.29(0.73-2.31), 0.383	—
Chronic Illness (Ref: None)	Ref	Ref	Ref	Ref
1-2	0.54(0.27-1.08), 0.083	**0.71(0.57-0.89), 0.003**	0.65(0.22-1.89), 0.428	**0.63(0.44-0.92), 0.016**
3+	0.76(0.39-1.51), 0.437	1.35(1.09-1.68), 0.007	1.02(0.35-2.96), 0.969	1.55(1.07-2.45), 0.021
ADL (Ref: None)	Ref	Ref	Ref	Ref
1-2	2.67(1.89-3.77), 0.000	**2.63(1.87-3.71), 0.000**	1.76(1.06-2.91), 0.027	**1.63(1.00-2.66), 0.048**
3+	10.64(7.36-15.39), 0.000	**10.27(7.14-14.76),0.000**	8.62(4.79-15.51), 0.000	**7.76(4.42-13.62),0.000**
IADL (Ref: None)	Ref	Ref	Ref	Ref
1-2	3.54(2.46-5.08), 0.000	**3.51(2.44-5.03), 0.0000**	3.65(2.06-6.47), 0.000	**3.76(2.13-6.62), 0.000**
3+	6.74(4.60-9.86), 0.000	**6.50(4.47-9.46), 0.000**	5.83(3.13-10.88), 0.000	**6.41(3.49-11.78), 0.000**

Note: UOR (Unadjusted Odds Ratio); AOR (Adjusted Odds Ratio); CI (Confidence Interval), ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living). The outcome variable 'Unmet Care Need' is coded 1 for Yes and 0 for No. A p-value threshold of < 0.10 was considered statistically significant.

CHAPTER 4: PREFERENCE VERSUS REALITY: THE ROLE OF SOCIOECONOMIC STATUS IN LONG-TERM CARE UTILIZATION AMONG OLDER ADULTS

Abstract

Background: This study examines the relationship between socioeconomic status (SES) and the concordance between preferred and utilized long-term services and supports (LTSS) among older adults. Two primary questions drive this exploratory research: “How does concordance between preferred and utilized LTSS vary by SES?” and “Are those in the middle class less likely to use care concordant with their preference?".

Methods: Utilizing data from the 2018 and 2019 National Health and Aging Trends Study (NHATS) rounds, 3,531 individuals aged 65 and older were asked about the best care option for an older adult needing assistance with personal care and mobility. Care preferences ascertained in 2018 were matched to care types used in 2019. Logistic regression models with backward elimination were used to determine factors significantly associated with concordance.

Results: Significant differences in concordance exist by SES. Both middle and upper-SES individuals had lower odds of concordance compared to low-SES individuals. Participants aged 75-84 had decreased odds of concordance regardless of SES. Education and insurance status were associated with decreased odds of concordance, comparing the middle and lower-SES groups but not the middle and upper-SES groups. Marital status and IADL limitations were associated with increased odds of concordance comparing the middle and upper-SES groups but not the middle and low-SES groups.

Discussion and Implications: This study's findings raise concerns about individuals' ability to access preferred care types, emphasizing the need for further research to guide policies and practices that better align LTSS options with the preferences of diverse socioeconomic groups.

Introduction

According to the United States Department of Health and Human Services (2019), 70% of adults ages 65 and older will need some type of long-term service and support (LTSS) during the remainder of their lifetime. Types of long-term care include informal and formal services and supports provided in the home, institutional care such as assisted living, and skilled nursing. The AP-NORC Center for Public Affairs Research (2021) found that almost 88% of older adults in the US report they prefer to receive care at home or in the home of a friend or family member, with care in one's own home preferred over care in the home of friends or family. Only 12% reported a preference for care in a facility. Prior research has consistently found that individuals prefer to age in place, and this has remained the dominant preference over time (Lehnert et al., 2019; McAuley & Blieszner, 1985; Kasper et al., 2019; Wolff et al., 2008). Abrahamson and colleagues (2017) found that consistent with the desire to age in place, individuals expect care to be provided by adult children (48%) and spouses (35%). Older adults have consistently reported being averse to institutional care (Wolff et al., 2008), yet the risk of entering a nursing facility at some point in their life is 35%, and the risk of entering any care facility is 37% (Hurd et al., 2017). A variety of personal and contextual factors influence an individual's care utilization, such as preferences, level of need, availability of informal and formal support, financial resources, and cultural norms (Lehnert et al., 2019).

The AP-NORC Center for Public Affairs Research (2021) found that 69% of Americans over the age of 40 report being ill-prepared for long-term care needs, and many underestimate their risk of needing care in later life. Individual perception of risk has proven influential in planning and preparing for future care needs (Yeh et al., 2021). These perceptions are influenced by various contextual factors such as age, living arrangement, health status, income, assets, and awareness of types of LTSS. Less is known about the broader interplay between these contextual factors and the role of one's socioeconomic status.

The necessity for LTSS is a paramount risk for older adults, with prior research finding a pervasive lack of preparedness for future care needs (Robinson et al., 2013; U.S. Department of Health and Human Services, 2019). Approximately 40% of adults aged 50 and older are under the assumption that Medicare covers long-term care costs, while another 18% think private health insurance will cover long-term care costs (Hamel & Montero, 2023). In reality, both only cover short-term, medically necessary services under certain criteria. These misconceptions contribute to lack of preparation and awareness which can result in individuals relying on care options that do not align with their preferences. Prevailing policy endeavors aimed at enhancing LTSS accessibility have predominantly concentrated on the economically disadvantaged segments of the population, likely due to Medicaid's role as the default payor of LTSS expenses. However, middle-income individuals who fall outside Medicaid's eligibility criteria represent a significant and growing proportion of the population over age 65 (Administration for Community Living, 2021). This cohort, characterized by household earnings ranging from two-thirds to twice the national median income (Pressman, 2015; Tyson et al., 2021), often finds itself lacking sufficient resources to afford the out-of-pocket costs associated with LTSS (Pearson et al., 2019; West & Dubay, 2019). These financial constraints can foster an increased reliance on informal caregiving arrangements. Demographic shifts characterized by declining fertility rates, reduced marriage rates, elevated divorce rates, and increased geographic mobility among family units have begun to diminish the capacity of informal support networks. As such, a heightened demand for formal care options is anticipated (Roth et al., 2015). Greater reliance on formal care will likely exacerbate the challenges faced by those with limited financial resources and may increase discordance between the care that is preferred and the care that is received.

Review of the Literature

Over the past few decades, long-term care options have evolved, lending to a growing body of research on individual preferences for future care needs. There is also a growing body of research on variations in care utilization and the relationship between preferences and utilization. Many of these studies use Andersen's healthcare utilization model (Andersen & Newman, 1973) to determine which predisposing, enabling, and need factors are the strongest determinants of one's preference and utilization. The Andersen healthcare utilization model posits that three types of factors influence an individual's use of health services: (a) predisposing factors, (b) enabling factors, and (c) need (Andersen & Newman, 1973). Predisposing factors include attitudes, knowledge, social norms, and perceived control over the situation at hand. Enabling factors impact the ability to access the care needed, such as support from friends and family, affordability, availability, or prior knowledge and experience. Need can be a function of the individual's own perception or the perception of others as to what the actual care needs are.

Predisposing and enabling factors such as less education, lower income, and lack of supplemental insurance have been associated with a preference for informal care at home (Wolff et al., 2008). Higher-income has been associated with greater preferences for paid help, but it is unknown whether this was due to financial resources or prior experience and awareness of paid options (Stoller & Cutler, 1993; Wolff et al., 2008). Similar research found that prior use and awareness of paid options were predictive of using paid care in the future (Eckert et al., 2004; Mahoney et al., 2004; Min, 2005; Pinquart & Sörensen, 2002), while others found having experience with a parent in a skilled nursing facility resulted in lower expectations of having informal care from family (Coe et al., 2015). In an examination of differences in long-term care expectations by sexual orientation, lesbian, gay, and bisexual adults were less likely than heterosexual adults to expect unpaid care from family and friends and were more likely to expect facility-based care, controlling for sociodemographic and health characteristics (Henning-Smith et al., 2015). These authors also found that the majority of older adults do not expect to need LTSS in the future, but factors such as being single, highly educated, having current ADL restrictions, or having prior experience, such as a relative who needed LTSS, were all associated with increased odds of expecting to need LTSS in the future. Other researchers found that the cost of care was not significantly associated with care preference (Eckert et al., 2004).

Earlier research found that predisposing factors such as age, education, and race and enabling factors such as marital status and income were significantly associated with care preferences (Keysor et al.,1999; McAuley & Blieszner, 1985), but later research found no such association (Eckert et al., 2004). In examining expectations about future care use based upon enabling factors such as current living arrangement, 73.3% of those ages 40 to 65 expected long-term services and support to be provided by family members (Henning-Smith & Shippee, 2015). Research has shown that persons who expect to receive care from a family member are less likely to prepare financially for future care needs, noting that 26.1% of those who preferred paid care purchased long-term care insurance compared to 15.7% of those who preferred care from family members (Brown et al., 2012). In a more recent study (Henning-Smith et al., 2021) examining variations in rural and urban older adults' care preferences, researchers found that most respondents preferred care at home, either paid or unpaid, with minimal differences in preference by rural and urban residents. However, differences by race, gender, and educational attainment were identified, primarily among rural respondents, with Blacks less likely than

Whites to opt for paid help in their home, and Hispanics and other races most likely to choose paid help at home and least likely to choose assisted living care as their preference. Women were more likely than men to prefer paid care at home, while men were more likely to choose unpaid care at home, followed by facility-based care. Individuals with a college degree were more likely to prefer paid care at home compared to those with a high school degree. Those with a high school degree were more likely to prefer unpaid care at home. This research emphasized the need to address barriers faced by rural residents, specifically those of lower SES, yet this research did not examine the role of income. In a comprehensive review of the available literature on care preferences, predisposing factors such as having children and being married or partnered were consistently positively associated with preferences for informal care at home, while factors such as age, gender, ethnicity, and education showed no consistent associations with care preference (Lehnert et al., 2019).

Care needs influence care preferences, with the preference for home care over facility-based care found to decline substantially as levels of functional or cognitive disability increase (Guo et al., 2015; Lehnert et al., 2019; Wolff et al., 2008). In examining care preferences among participants with high care needs and assessing preferences across six stages of need, Guo and colleagues (2015) found that preferences varied by health status and level of need. Others found that as care needs increased, preferences shifted from informal care at home, while those with more extensive needs tended towards facility-based care (Lehnert et al., 2019).

As it relates to preferences aligning with utilization, an examination of the relationship between informal care expectations and unmet needs found that 32% of study participants had unmet expectations, of which 37% received formal care versus informal care and 30% were going without needed care (Abrahamson et al., 2017). An expectation was deemed unmet if study respondents identified an informal caregiver expected to provide care but were receiving care from another source (i.e., formal care) or not receiving any needed care. These researchers concluded that unmet expectations related to informal care resulted in unplanned reliance on formal care options and increased the likelihood of having unmet needs. The same analyses determined that being single, older, and having an increased number of ADL deficits were positively associated with unmet expectations. Children, race, income, and long-term care insurance coverage showed no significant association with unmet expectations. Research on the relationship between care preferences, care used, and quality of life outcomes found that while respondents' reported preferences were relatively equally distributed across unpaid care at home, paid care at home, and assisted living, in follow-up surveys, only one-third were receiving care that matched their previously reported preference, indicating discordance between care preferences and actual care used (Kasper et al., 2019). Key demographic findings from that study indicated that those aged 85 and older were more likely to use care that matched their preferences than persons aged 65–74; those with only a high school education were less likely to use care that matched their preferences than those with higher education; black non-Hispanics were less likely to use care that matched their preferences than white non-Hispanics; those living with an adult child were less likely than those living with a spouse to use care that matched their preferences; and those living in assisted living were more than twice as likely to be using care that matched their care preferences. No significant association was found between income and concordance between preferences and care used (Kasper et al., 2019).

An abundance of research has examined differences in care preferences and care utilization based on factors such as living arrangements, rural and urban locations, health status, and sexual orientation; however, less is known about the relationship between SES and care concordance. While the studies mentioned above have contributed to a foundational understanding of the factors that influence concordance between care preferences and actual care used, I am not aware of any studies that explicitly examined differences between care preferences and care used by SES. My research sought to address this gap by examining the relationship between SES and the concordance between LTSS preference and LTSS used. This examination contributes to the existing literature on whether what one perceives as an ideal care situation aligns with the care used and focuses on the role of SES. Two primary questions drive my research “How does concordance between preferred and utilized LTSS vary by SES?” and “Are those in the middle class less likely to use care concordant with their preference?" The intent of my research is to uncover differences in how SES affects the alignment between preferred and actual LTSS used, thereby highlighting areas for further investigation.

Coordinating and selecting an LTSS is an arduous process with various layers of complexity impacted by various factors, which can impact individual autonomy in the decision-making process. My research examines whether one’s SES, an enabling factor, is a critical determinant in whether an individual receives the LTSS they prefer.

Methods

Study Design and Participants

Data from the 2018 and 2019 rounds of the National Health and Aging Trend Study (NHATS) were used for this study. NHATS uses a nationally representative sample of Medicare beneficiaries ages 65 and older, collecting detailed information on health, functioning, living environments, and demographic and other contextual data. Since 2011, NHATS has conducted annual in-person interviews with older adults to enable research on disability trends and dynamics in the older population. Additional information on the NHATS sampling design and methods can be found elsewhere (Kasper & Freedman, 2020).

Information related to care preferences has only been ascertained in two rounds of NHATS, 2012 and 2018. In 2012, care preference data was obtained from a random sample (n=1,783) rather than the full sample. In 2018, care preference data was collected from the full sample, of which responses were obtained from 82% (n=4,555). My research utilized care preference data from the 2018 round of NHATS instead of 2012 to achieve a larger sample size. To align with my prior research (Eberly, 2024a, 2024b), observations from the 2019 round were used to identify those receiving some type of care (informal care at home, formal care at home, assisted living, and skilled nursing) and those responses were matched to preferences identified in the 2018 round to create a measure of concordance across care types. The 2019 round included 4,977 respondents. Individuals not receiving any care were excluded (*n*=1112), as were individuals with missing data related to the control variables (*n*=79). An additional 255 respondents were lost due to attrition and inability to be matched with 2018 responses. This inclusion and exclusion criteria resulted in a final sample of 3,531.

Measures

Socioeconomic Status

Operational definitions of socioeconomic status can vary across studies and populations, as can the classification of low, middle, and upper-class status or position. Consistent with Grundy and Holt (2001), researchers should choose their measures of SES depending on the study design and the data available, noting that when data on income and education are both available, using both can result in collinearity (Braveman et al., 2005). NHATS respondents report total household income, including Social Security, Supplemental Security Income, Veterans Administration payments, pensions, retirement funds, and investment income. To account for those who do not report income or reported income by bracket only, NHATS provides imputed income values (DeMatteis et al., 2020). In the 2019 round, 69% of the sample reported total income, while 18% reported an income bracket (DeMatteis et al., 2020). NHATS created a bracketed income value for 87% of the sample and imputated income for 13% (DeMatteis et al., 2020). Given the NHATS expansive approach to income data collection, my study employs a measure of SES based on total household income. I believe this measure accurately depicts an individual's financial resources, which is the key factor of interest as it relates to access and affordability of LTSS (U.S. Department of Health & Human Services, 2019).

Two standard methods for defining income classes are: 1) the percentile-based approach, in which the sample is grouped into quintiles with the bottom 20% classified as low-income, the middle 60% classified as middle-income, and the top 20% classified as upper-income, and 2) multiples of the median national household income, in which households earning less than two-thirds of median are classified as low-income, two-thirds to double the median are classified at middle-income, and more than double the median are classified as upper-income (Pressman, 2015; Tyson et al., 2021). For my analysis, I used the latter approach using the 2019 median national household income of $68,703 (U.S. Census Bureau, 2020). The 2019 median national household income for those over age 65 was just slightly higher at $70,254 (Administration for Community Living, 2021). Additional context related to defining and measuring the middle class can be found elsewhere (Elwell, 2014; Kochhar & Sechopoulos, 2022; Pressman, 2015; Tyson et al., 2021). This approach resulted in SES classifications of <$45,803 (low), $45,803-$137,407 (middle), and >$137,407 (upper). I also conducted a sensitivity analysis using income classifications of <$28,000 (low), $28,001-$80,000 (middle), and >$80,000 (upper) in the regression models to align with the percentile methodology.

Care Preferences

In the 2018 round of NHATS, study participants were asked to "Imagine a person named Pat, who is 80 years old with health problems. Because of these problems, {he/she} needs someone to help with bathing, dressing, and getting around inside. Please look at this card and tell me what would be best for Pat?" The survey intentionally used a hypothetical situation to reduce social desirability bias and to prevent those who may currently be receiving care from saying that was the ideal type of care (Kasper et al., 2019). Each respondent was given five options: 1) help at home from friends and family; 2) paid help at home; 3) living with an adult child; 4) assisted living facility; or 5) nursing facility. Given that living with an adult child implies informal care, help at home from friends and family and living with an adult child were combined to create one variable reflecting informal care at home. This resulted in four categories of care preference: 1) unpaid help at home, 2) paid help at home, 3) assisted living facility, and 4) skilled nursing facility.

Care Type Used

Using 2019 NHATS data, care type was ascertained from reports of who provided assistance (family and friends or paid helpers) with ADLs, IADLs, supplemental tasks, and residential status (community, residential care, or skilled nursing). Responses were categorized to align with care preference responses of 1) unpaid help at home, 2) paid help at home, 3) assisted living facility, and 3) skilled nursing facility. Additional methodology for identifying care type is detailed in a previous study (Eberly, 2024a).

Care Concordance

For those receiving care in round nine (2019), the type of care used was matched to the care preferences identified in round eight (2018) to create an aggregate dichotomous outcome variable representing concordance between preference and use. Concordance was coded “1” for concordant and “0” for discordant.

Control Variables

Control variables included the predisposing, enabling, and need variables identified in the theoretical framework (Andersen & Newman, 1973). Predisposing variables included age, gender, race/ethnicity, and educational attainment. Each of these variables was represented categorically with three age groups (65-74; 75-84; 85 or older); two gender groups (male and female); three race groups (white non-Hispanic; black non-Hispanic; Hispanic/Other); and four education groups (< high school diploma; high school diploma; 2-4 years of college; > bachelor’s degree). Enabling variables were marital status (married/living together; or single/divorced/widowed); children (yes/no); and long-term care coverage, including government funded and private coverage (yes/no). Need was represented by self-reported dementia diagnosis(yes/no); the number of chronic conditions: heart disease, high blood pressure, arthritis, stroke, diabetes, cancer, lung disease, and osteoporosis (0; 1-2; 3 or more); reported limitations related to IADLs of shopping, housekeeping, cooking, banking, medication management, and laundry (0, 1-2; 3 or more); and reported limitations related to ADLs of bathing, dressing, feeding, mobility, and toileting (0, 1-2; 3 or more).

Analysis

All analyses were conducted using Stata 18.0. Bivariate analyses explored the relationships between SES and concordant care and the relationship between SES and control variables. To address the first research question, “How does concordance between preferred and utilized LTSS vary by SES?” I used logistic regression models incorporating all SES categories. To address the second research question, “Is the middle class less likely to use care concordant with their preference?" I used two logistic regression models to compare middle-income to low-income and middle-income to upper-income. This approach provided a targeted analysis of middle-class concordance compared to the other SES groups, accounting for the differences between the upper and lower SES groups. All analyses employed a stepwise approach with backward elimination to determine the most significant predictors of concordance. This process involved iteratively removing variables from the logistic regression model based on their statistical significance, using a p-value threshold of 0.10. This stepwise elimination process ensured that the final logistic regression models included only those variables that were statistically significant and most strongly associated with concordance between care used and care preferred. This approach is a standard method in statistical analysis to refine models by focusing on the most influential predictors (Bursac et al., 2008; Dunkler et al., 2014).

Results

Descriptive Summary of Participants

Table 4a presents the demographic and functional characteristics of the study participants. The concordance distribution showed a little over one-third (37.2%) receiving care concordant with their preferences. The majority of participants were classified as low-income (56.9%), followed by middle-income (35%) and upper-income (8.1%). The age distribution showed that about half of the participants were aged 75-84, with those aged 85 and older comprising 29.5% and those aged 65-74 accounting for 21.2% of the sample. Regarding race and ethnicity, 72.2% of participants were White, about 20% were Black, and 8% were other races. The study sample included more women (57.7%) than men (42.3%). Nearly 93% reported having children. Marital status was evenly distributed, with half being single, divorced, or widowed and half being married or partnered. Educational attainment varied, with 33.4% having 2-4 years of college, 32.7% having a high school or trade education, 19.0% having less than a high school education, and 14.9% having more than four years of college education. Just over half of the participants did not have insurance that would pay for long-term care services (55.1%). A dementia diagnosis was reported by 7.4%, and nearly 96% reported having at least one chronic condition. In regard to functional capacity, 52.3% of participants reported requiring no assistance with IADLs, 27.9% required assistance with one to two IADLs, and 19.8% required assistance with three or more IADLs. Similarly, 52.2% required no assistance with ADLs, 29.4% required assistance with one to two ADLs, and 18.4% required assistance with three or more ADLs.

Aggregate Concordance of Care Preferences versus Care Used

Table 4b displays the aggregate concordance between the care type used and preferred across the four care types. Preferred Care indicates what types of care participants reported as their preference, and Care Used depicts the type of care they reported using. The four care categories are listed under each: unpaid home care, paid home care, ALF (Assisted Living Facility), and SNF (Skilled Nursing Facility). Each cell at the intersection of Preferred Care and Care Used represents a different calculation. The Row % shows the proportion of respondents within that preference category who received each type of care, the Column % indicates the distribution of respondents within the care received category who reported a particular care preference, and the Sample % shows the percentage of the total respondents in that SES group represented by the cell. For example, of all the individuals who received unpaid home care, 36.7% identified this as their preference. The Sample % reflects the percentage of the total sample. For example, 27.0% of the total sample preferred and received unpaid home care. The total row and column at the bottom and far right of the table provide summary percentages across all categories. A Wilcoxon signed-rank test yielded a statistically significant difference in the ranks of the paired observations, with a test statistic of z = 32.387 and $p < 0.001$.

The majority of individuals preferring unpaid home care received it (76.7%; n=954), as reflected in the unpaid home care column and unpaid home care Row % row, while preferences for all other types of care showed much lower concordance. Among those preferring paid home care, concordance was 20.3%, with the majority receiving unpaid home care (74.3%). For those preferring care in an assisted living facility, concordance was 13.0%, with the majority receiving unpaid home care (68.9%). Preferences for skilled nursing facilities had the lowest concordance at 7.2%, with the majority receiving unpaid home care (72.9%).

Concordance of Care Preferences Versus Care Used, Stratified by SES

Table 4c displays concordance between the care type used and the care type preferred stratified by the SES groups. Similar to Table 3b, for each SES group (low, middle, upper), the rows under Preferred Care indicate the respondents' preferred care type. The corresponding Care Used columns reflect the type of care received. Within each cell, three percentages are displayed. The Row % shows the proportion of respondents within that preference category who received each type of care, the Column % indicates the distribution of respondents within the care received category who reported a particular care preference, and the Sample % shows the percentage of the total respondents in that SES group represented by the cell. For example, in the low SES group, of those who preferred unpaid home care, 76.4% received it (Row %), but of all individuals who received unpaid home care, 42.3% preferred it (Column %). The Sample % reflects the percentage of the total sample such that 30.5% of the low SES group preferred and received unpaid home care care. Among those who selected unpaid home care as the best option, concordance was slightly higher for the middle-SES group (78.0%) than the lower-SES group

(76.4%) and lowest for the upper-SES group (72.7%), as reflected in the unpaid home care column and the unpaid home care Row % row.

Among those who selected paid home care as the best option, concordance was highest for the low-SES group (21.6%) and lowest for the upper-SES group (17.4%%), as reflected in the paid home care column and the paid home care Row % row. Among those who selected assisted living as the best care option, concordance was highest for the low-SES group (15.3%) and equal for the middle and upper-SES groups (10.8%), as reflected in the ALF column and the ALF Row % row. Among those who selected skilled nursing as the best option, concordance was again highest for the low-SES group (9.4%) and lowest for the middle-SES group (1.5%), as reflected in the SNF column and the SNF Row % row. The results in this table indicate discordance between care preferences and care received, particularly for those in the middle and upper-SES groups who prefer paid care options such as paid care at home or in a facility.

For the low-SES group, the data shows that among those who preferred unpaid home care, 17.6% received paid home care instead, followed by assisted living (3.6%) and skilled nursing (2.4%). The majority of those who preferred paid home care received unpaid home care (71.8%), followed by assisted living (4.7%) and skilled nursing (1.9%). Among those who preferred assisted living, 65.7% received unpaid home care, followed by paid home care (15.5%) and skilled nursing (2.6%). Most of those who preferred skilled nursing care received home-based care, either unpaid (69.9%) or paid (20.7%). These results are reflected in the Row % row for the corresponding Preferred Care type and Care Used column on the low-SES segment of Table 4c.

For the middle-SES group, among those who preferred unpaid home care, 18.3% received paid home care, followed by 3.5% in assisted living and 0.3% in skilled nursing.

Among those who preferred paid home care, 76.2% received unpaid care, with 4.1% in assisted living and 0.2% in skilled nursing. For those who preferred assisted living, 72.4% received unpaid care at home, while 16.3% received paid home care, and .5% were in skilled nursing. Among those who preferred care in a skilled nursing facility, 98.5% received care at home, with the majority (81.8%) receiving unpaid care. These results are reflected in the Row % row for the corresponding Preferred Care type and Care Used column on the middle-SES segment of Table 4c.

For the upper-SES group, among those who preferred unpaid home care, 24.4% received paid home care, followed by 3.0% receiving care in assisted living. Among those who preferred paid home care, 78.9% received unpaid home care, and 3.7% received care in assisted living. For those who preferred assisted living, 70.6% received unpaid care at home, followed by paid care at home (18.6%). The data indicates that for those in the upper class who preferred care in a skilled nursing facility, 100% received care at home, with 75.0% receiving unpaid care at home and 25.0% receiving paid care at home. These results are reflected in the Row % row for the corresponding Preferred Care type and Care Used column on the upper-SES segment of Table 4c.

Bivariate Results – Factors Associated with Care Concordance

Table 4d displays the bivariate results examining the association between SES and the concordance of LTSS preference with LTSS use, showing significant differences across SES categories (*p* = .000). Participants in the middle and upper-SES groups had lower odds of using care concordant with their preference (OR = 0.74, 95% CI = [0.64,0.86] and OR = 0.55, 95% CI = [0.42,0.72], respectively) compared to those in the low-SES group. Among age groups, participants aged 85 and older had increased odds of having care concordant with preference compared to those in the 65-74 age group (OR= 1.21, (95% CI = [1.00,1.47]). No significant difference was observed among those in the 75-84 age group. Regarding race/ethnicity, no significant differences were observed. Similarly, one's biological sex, whether they had children, dementia status, and chronic illness showed no significant differences in care concordance. However, marital status and education levels were significantly associated with care concordance. Single participants had increased odds of receiving care concordant with preference (OR = 1.27, 95% CI = [1.11,1.46]), while those with higher education had lower odds of receiving care concordant with preference. Insurance status also showed a significant association, with insured participants having lower odds of care concordant with preference than uninsured participants (OR = 0.84, 95% CI = [0.73,0.97]). No significant difference in concordance among those with 1-2 ADL limitations was found; however, those with three or more ADL limitations showed a significant trend toward increased odds of care type concordance (OR = 1.21, 95% CI = [1.00,1.45]). Similar to ADLs, those with 1-2 IADL limitations did not significantly differ from the reference group; however, individuals with three or more IADL limitations had increased odds of care type concordance (OR = 1.24, 95% CI = [1.04-1.48]).

Logistic Regression Analysis of Factors Associated with Concordance

In response to the first research question examining how concordance differs by SES, Table 4e presents the unadjusted and adjusted odds of utilizing care concordant with preference for all SES categories. The unadjusted logistic regression model (*n* = 3,531) examined the association between various predisposing, enabling, and need factors and the concordance of LTSS preference with actual LTSS used. The model revealed that participants in the middle-income category had significantly lower odds (OR = 0.79, 95% CI = [0.66,0.95], *p* =

0.012) of having care concordant with their preference compared to the low-income category. Upper-income participants had even lower odds (OR = 0.59, 95% CI = [0.43, 0.82], *p* = 0.002) of care concordance. The only variables achieving statistical significance in the unadjusted model were the age category of 75-84 (OR = 0.85, 95% CI = [0.71,1.02]), having a high school education (OR = 0.78, 95% CI = [0.64,0.97]) or two to four years of college (OR = 0.78, 95% CI = [0.63,0.98]), and having insurance (OR = 0.82, 95% CI = [0.71,0.94]). The model's goodness-of-fit was acceptable (Pearson chi2(2101) = 2152.33, Prob > chi2 = 0.2131), indicating a reasonable fit to the data.

The adjusted logistic regression model retained six variables: middle income, upper income, age 75-84, high school/trade education, 2-4 years of education, and insurance status. In this model, both middle-income (OR = 0.75, 95% CI = [0.64,0.87], *p* < 0.001) and upper-income (OR = 0.55, 95% CI = [0.41,0.71], *p* < 0.001) groups had significantly lower odds of having care concordant with their preference compared to the low-income group. Participants aged 75-84 also showed significantly lower odds of having care concordant with their preference (OR = 0.792, 95% CI = [0.69,0.91], *p* = 0.001), compared to those aged 64-74, as did those with high school/trade education (OR = 0.83, 95% CI = [0.70,0.99], *p* = .022), two to four years of education (OR = 0.84, 95% CI = [0.71,0.99], *p*= 0.031), and those with insurance (OR = 0.83, 95% CI = [0.72,0.95], *p* = 0.008). The model's goodness-of-fit was strong (Pearson chi2(29) = 23.77, Prob > chi2 = .7402, indicating a better fit to the data than the unadjusted model.

In response to the second research question examining whether those in the middle-SES group are less likely to use care concordant with their preference, Table 4f presents the unadjusted and adjusted odds of care concordance using individual comparisons of the middle-SES group to the lower-SES and upper-SES group. In the comparison of the middle-SES group to the lower-SES group, the adjusted model shows those in the middle-SES group had lower odds of care concordance compared to those in the low-SES group (OR = 0.75, 95% CI =

[0.64,0.87], $p < 0.001$). Decreased odds of concordance also were significantly associated with age for those aged 75-84 compared to the 65-74 age group (OR = 0.80, 95% CI = [0.69-0.92], $p = 0.002$) and education, particularly for those with high school/trade education or 2-4 years of college (OR = 0.82, 95% CI = [0.69-0.98], $p = 0.026$; OR = 0.81, 95% CI = [0.68-0.97]. p=0.24) compared to those who did not graduate from high school. Those with insurance also had decreased odds of concordance (OR = 0.80, 95% CI = [0.69-0.93], $p = 0.003$). In the comparison of the middle-SES to upper-SES group, the adjusted model shows those in the middle-SES group had increased odds of care concordance compared to those in the upper-SES group (OR = 1.29, 95% CI = [0.97-1.72], $p = 0.084$). Being single (OR = 1.258, 95% CI = [0.978-1.618], $p = 0.074$) compared to those who were partnered and having three or more IADL needs (OR = 1.396, 95% CI = [0.995-1.958], $p = 0.054$) compared to those having no IADL needs were both significantly associated with increased odds of care concordance. Those aged 75-84 had decreased odds of care concordance compared to those aged 65-74 (OR = 0.815, 95% CI = [0.655-1.014], $p =$ 0.066).

Summarizing the key differences in the results from Table 4f, those in the middle-SES group had decreased odds of concordance compared to the low-SES group but increased odds compared to the upper-SES group. Being in the 75-84-year age group was the only factor significantly associated with decreased odds of concordance regardless of SES. Education and insurance were significantly associated with decreased odds of concordance when comparing the middle-SES and low-SES groups but not when comparing those in the middle and upper-SES groups. Being single and having IADL needs were significantly associated with increased odds of concordance when comparing the middle-SES and upper-SES groups but not when comparing the middle-SES and lower-SES groups. Both adjusted models had acceptable goodness of fit but very low pseudo R^2 values (0.0093 and 0.0089, respectively), suggesting that while the predictors are statistically significant, they explain an inconsequential proportion of the variance in care concordance.

Sensitivity Analysis

The results of a sensitivity analysis using the percentile approach for measuring SES, not shown, were not meaningfully different from the results presented.

Discussion

The findings of this study provide insight into the relationship between SES and concordance between care preference and care utilization among older adults. My research addressed two questions. In response to the first question, how does concordance between preferred and utilized LTSS vary by SES: across all SES groups, a substantial proportion of individuals did not receive their preferred care type, particularly those preferring paid care options. This pattern was more pronounced for ALF and SNF preferences among the middle and upper-SES groups, where the vast majority received unpaid home care, compared to the middle and low-SES group comparison. Consistent with prior research, my research found that the majority of older adults prefer to be cared for at home (Eckert et al., 2004; Kasper et al., 2019; Lehnert et al., 2019; McAuley & Blieszner, 1985; Wolff et al., 2008). Upon examining care preferences by SES, across all SES groups, a higher proportion of older adults preferred unpaid care at home over the other care options. Prior research has been inconsistent in their findings on preferences for paid versus unpaid care at home, with some finding a propensity for paid care while others have found a propensity for unpaid care (Lehnert et al., 2019).

Turning to my second research question is the middle class less likely to use care concordant with their preference: among the middle and upper-SES groups, I found a higher proportion of older adults in the middle and upper-SES groups favored paid home care and assisted living, compared to the lower-SES group. These findings are consistent with prior research, which found that higher income was positively associated with preferences for paid care (Stoller & Cutler, 1993; Wolff et al., 2008). While my research found that the middle and upper-SES groups have decreased odds of concordance compared to the low-SES group, key differences in factors influencing concordance when comparing the middle and lower-SES groups versus the middle and upper-SES groups were found.

The majority of respondents used care discordant with their preferences, with those in the middle and upper-SES groups, high school graduates, those with college education, those aged 75-84, and those with insurance to assist with LTC costs all having decreased odds of receiving care concordant with preference when examining variances across all three SES categories. Overall concordance of just over one-third aligns with prior research (Kasper et al., 2019). Results for several of the control variables are also of interest. Prior research found those with a high school education to have decreased odds of concordance compared to those with higher education (Kasper et al., 2019), which differs slightly from my findings. My research found that high school education and 2-4 years of college were associated with decreased odds of concordance. However, these findings were only significant when comparing the middle and low-SES groups, not when comparing the middle and upper-SES groups. Individuals with higher education levels may have greater awareness of the variety of care options available and thus have more specific care preferences, which are harder to meet for those in the middle-SES group where financial constraints may limit options. In contrast, upper-class individuals can typically access a wider range of care options due to fewer financial limitations. Thus, the impact of education on care concordance is more pronounced when economic constraints are considered.

While having insurance that covers LTC expenses may be perceived as contributing to increased concordance between preference and utilization, the decreased concordance found in my study is not surprising. Insurance may contribute to increased preference for paid care options due to having this resource for payment; however, insurance may not cover the preferred options, resulting in discordance. Decreased odds of concordance prevailed when comparing the middle and lower-SES groups, but no significant association was found when comparing the middle and upper-SES groups. Less affluent individuals are more likely to have access to Medicaid or similar public assistance programs. These programs can limit choices due to predefined service networks and covered care types, potentially aligning more closely with the care options realistically accessible to those in the low-SES group, affecting concordance differently. Those in the middle-SES groups may have private insurance or be on the cusp of qualifying for public assistance, leading to a gap where their care preferences and the care they can afford or access through insurance do not align, decreasing concordance. Higher income individuals often have the financial means to afford care options beyond what insurance covers. This financial capability may diminish the impact of insurance on care concordance, as upper-class individuals may more easily bridge the gap between preferred care and the care they receive.

As for decreased odds of concordance among those aged 75-84, this age group is often in a transition period where independence begins to decline (Kabayama et al., 2018; Tabira et al., 2020). They may still prefer less intensive care options, such as informal care at home, but find themselves needing more intensive options, which results in discordance. Decreased odds of concordance among this age group prevailed in the models comparing the middle class to the lower and upper-class categories. Prior research found no significant association between this age group and concordance but did find a significant association between those aged 85 and older and increased odds of concordance (Kasper et al., 2019).

Being single and having a greater number of IADL needs increased the odds of concordance among those in the middle-SES group when compared to the upper-SES group but not when compared to the low-SES group. This finding may warrant further examination, specifically related to the role of marital status.

In the individual models comparing the middle-SES group to the lower and upper-SES groups (Table 3f), participants in the middle-SES group had lower odds of concordance compared to those in the lower-SES group but higher odds of concordance compared to those in the upper-SES group. These results suggest that financial resources alone may not guarantee access to preferred care types. Systemic barriers or a lack of available care options may also deter alignment with individuals' preferences.

Implications

Not only does my research bring awareness of potential barriers to preferred care due to affordability, it also raises concerns related to the declining pool of informal caregivers. Across all income groups, concordance was highest for unpaid home care and lower for paid care options. As the pool of informal caregivers continues to decline due to reduced fertility rates, lower marriage rates, higher divorce rates, and greater geographic mobility among family units (Roth et al., 2015), having a smaller informal support network may contribute not only to greater preference for paid care options, but greater reliance as well. If paid options are unattainable or unsustainable for an extended period, particularly for those middle-income groups ineligible for public assistance and with limited financial resources, the declining availability of informal caregivers may place middle-income older adults at greater risk of having unmet care needs, resulting in adverse outcomes which contribute to increased healthcare costs. This highlights the need for policy initiatives focused on increased education and awareness related to planning for future care needs, understanding care options, and preparing financially.

The absence of association between concordance and any substantial need-related factors (i.e., chronic illnesses, ADL limitations) suggests that financial resources and other enabling variables (i.e., education, insurance, marital status) play a greater role than need in determining whether individuals can access the care that they prefer. Initiatives to improve concordance can support a person-centered approach to LTSS delivery with consideration of individual autonomy in LTSS decision-making. Future research should guide these initiatives by examining how older adults and their families make decisions about long-term care, including their preferences, planning behaviors, and information needs. Insights from such research can guide the development of targeted education and support services to assist individuals in planning for their future care needs.

Strengths and Limitations

A strength of my study is that it contributes to existing literature examining the relationship between SES and the concordance between care preferences and actual care used in later life and focuses on the role of SES. The study employed a comprehensive approach by considering multiple factors influencing preferences aligning with utilization. By controlling for predisposing, enabling, and need factors, my study offered a more nuanced perspective on the association between SES and concordance of preferences and utilization. Using individual models comparing the middle-SES group to the low-SES and upper-SES groups provided additional detail that would have been if using a combined upper and lower referent group or using the middle-SES as the referent group. I performed a sensitivity analysis using alternate income categorizations for low, middle, and upper SES. The analysis revealed similar results, demonstrating the reliability of my findings.

My study is not without limitations. My research employed a cross-sectional analysis, which does not determine causality or capture changes that occur over time. Future research may consider a longitudinal analysis examining whether concordance is more or less likely to align with utilization as one moves across or within the long-term care spectrum and how these patterns vary by SES. Additionally, given the brief duration between the year care preferences (2018) and care used (2019) were ascertained, results could vary if care used was ascertained from a later year. By using 2018 care preference data and 2019 data on the type of care used, it is likely that individuals were already using some form of care when asked about care preference. Despite care preference being positioned as a hypothetical question, the potential for reporting bias exists. Similarly, since study participants were individuals at greater risk of needing LTSS or currently using LTSS, the findings may be different if preferences in middle age were compared with the type of care used in later life. Qualitative methods should be used in future research to provide a deeper understanding of the reasons behind the patterns identified in this analysis. A mixed-methods approach would allow for triangulating findings and strengthening the overall study conclusions. Lastly, considerable variability in how SES is measured exists across different studies. This variability can complicate comparisons across studies and may affect the consistency of findings.

Conclusion

The findings from my study raise concerns about the ability of individuals to access preferred care types, emphasizing the need for policies and practices that better align LTSS options with the preferences of diverse socioeconomic groups. It is helpful to address this discordance through increased awareness of long-term care risk, care options, and associated costs and identify potential resources to help individuals plan and financially prepare for future long-term care needs.

References

Abrahamson K., Hass Z., & Sands, L. (2017). Likelihood that expectations of informal care will be met at onset of caregiving need: A retrospective study of older adults in the USA. *BMJ Open*, 7, e017791. doi: 10.1136/bmjopen-2017-017791

Administration for Community Living. (2021). 2020 Profile of Older Americans. U.S. Department of Health and Human Services. Retrieved from https://acl.gov/sites/default/files/aging%20and%20Disability%20In%20America/2020Profileolderamericans.final_.pdf

American Psychological Association, Task Force on Socioeconomic Status. (2007). *Report of the APA Task Force on Socioeconomic Status*. Washington, DC: American Psychological Association.

Andersen, R., & Newman, J. F. (1973). Societal and individual determinants of medical care utilization in the United States. *The Milbank Memorial Fund quarterly. Health and Society*, *51*(1), 95–124.

Braveman, P. A., Cubbin, C., Egerter, S., Chideya, S., Marchi, K. S., Metzler, M., & Posner, S. (2005). Socioeconomic status in health research: one size does not fit all. *JAMA*, *294*(22), 2879–2888. https://doi.org/10.1001/jama.294.22.2879

Brown, J. R., Goda, G. S., & McGarry, K. (2012). Long-Term Care Insurance Demand Limited By Beliefs About Needs, Concerns About Insurers, And Care Available From Family [1]. *Health Affairs, 31*(6), 1294-1302. https://doi.org/10.1377/hlthaff.2011.1307

Bursac, Z., Gauss, C. H., Williams, D. K., & Hosmer, D. W. (2008). Purposeful selection of variables in logistic regression. *Source Code for Biology and Medicine*, *3*(1), 17–17. https://doi.org/10.1186/1751-0473-3-17

Coe, N. B., Skira, M. M., & Van Houtven, C. H. (2015). Long-term care insurance: Does experience matter? *Journal of Health Economics*, *40*, 122–131. https://doi.org/10.1016/j.jhealeco.2015.01.001

DeMatteis, J., Freedman, V., Kasper, J.., & Jiao, R. (2020). National Health and Aging Trends Study Round 9 Income Imputation. NHATS Technical Paper #27. Johns Hopkins University School of Public Health.

Dunkler, D., Plischke, M., Leffondré, K., & Heinze, G. (2014). Augmented backward elimination: a pragmatic and purposeful way to develop statistical models. *PloS One*, *9*(11), e113677–e113677. https://doi.org/10.1371/journal.pone.0113677

Eberly, L. (2024a). *Exploring Socioeconomic Differences in Informal Versus Formal Care Utilization Among Older Adults*. Unpublished manuscript, Manuscript in preparation for dissertation, University of North Carolina at Charlotte.

Eberly, L. (2024b). *Examining the Relationship Between Socioeconomic Status and Unmet Care Needs Among Older Adults*. Unpublished manuscript. Manuscript in preparation for dissertation, University of North Carolina at Charlotte.

Eckert, J. K., Morgan, L. A., & Swamy, N. (2004). Preferences for receipt of care among community-dwelling adults. *Journal of aging & social policy*, *16*(2), 49–65. https://doi.org/10.1300/J031v16n02_04

Elwell, C. (2014). The Distribution of Household Income and the Middle Class. Washington, DC: Congressional Research Service. https://fas.org/sgp/crs/misc/RS20811.pdf

Genworth Cost of Care Survey. (2021). https://www.genworth.com/aging-and-you/finances/cost-of-care.html

Grundy, E., & Holt, G. (2001). The socioeconomic status of older adults: How should we measure it in studies of health inequalities? *Journal of Epidemiology and Community Health*, *55*(12), 895–904. https://doi.org/10.1136/jech.55.12.895

Guo, J., Konetzka, R. T., Magett, E., & Dale, W. (2015). Quantifying long-term care preferences. *Medical Decision Making*, *35*(1), 106–113. https://doi.org/10.1177/0272989X14551641

Hamel, L., & Montero, A. (2023, November 14). *The affordability of long-term care and support services: Findings from a KFF survey*. Kaiser Family Foundation. https://www.kff.org/health-costs/poll-finding/the-affordability-of-long-term-care-and-support-services/

Henning-Smith, C., & Shippee, T. (2015). Expectations about future use of long-term services and supports vary by current living arrangement. *Health Affairs*, *34*(1), 39–47. https://doi.org/10.1377/hlthaff.2014.0556

Henning-Smith, C., Gonzales, G., & Shippee, T. (2015). Differences by sexual orientation in expectations about future long-term care needs among adults 40 to 65 years old. *American Journal of Public Health*, *105*(11), 2359–2365. https://doi.org/10.2105/AJPH.2015.302781

Henning-Smith, C., Mulcahy, J., Lahr, M., & Tanem, J. (2021). Preferences for long-term care arrangements among rural and urban older adults. *University of Minnesota Rural Health Research Center.* https://rhrc.umn.edu/wp-content/uploads/2021/09/UMN-Aging-in-Place-Policy-Brief_5.1.21_508.pdf

Hurd, M. D., Michaud, P.-C., & Rohwedder, S. (2017). Distribution of lifetime nursing home use and of out-of-pocket spending. Proceedings of the National Academy of Sciences - PNAS, 114(37), 9838–9842. https://doi.org/10.1073/pnas.1700618114

Kabayama, M., Mikami, H., & Kamide, K. (2018). Multidimensional factors associated with the loss of independence: A population‐based longitudinal study. *Geriatrics & Gerontology International*, *18*(3), 448–455. https://doi.org/10.1111/ggi.13209

Kasper, J., & Freedman, V. (2020). National Health and Aging Trends Study User Guide: Rounds 1-9 Final Release. Baltimore: Johns Hopkins University School of Public Health.

https://nhats.org/sites/default/files/2021-04/NHATS_User_Guide_R9_Final_Release_0.pdf

Kasper, J., Wolff, J., & Skehan, M. (2019). Care arrangements of older adults: What they prefer, what they have, and implications for quality of life. *The Gerontologist*, *59*(5), 845–855. https://doi.org/10.1093/geront/gny127

Keysor, P.T., Desai,T., & Mutran, E.J.(1999).Elders' preferences for care setting in short- and long-term disability scenarios.The Gerontologist,39(3), 334-344. https://doi.org/10.1093/geront/39.3.334

Kochhar, R., & Sechopoulos, S. (2022). *How the American Middle Class has changed in the past five decades*. Pew Research Center. https://www.pewresearch.org/short-reads/2022/04/20/how-the-american-middle-class-has-changed-in-the-past-five-decades/

Lehnert T., Heuchert M., Hussain K., & Konig, H. (2019). Stated preferences for long-term care: A literature review. *Ageing & Society*, 1–41. doi:10.1017/S0144686X18000314

Mahoney, K. J., Simon-Rusinowitz, L., Loughlin, D. M., Desmond, S. M., & Squillace, M. R. (2004). Determining personal care consumers' preferences for a consumer-directed cash and counseling option: Survey results from Arkansas, Florida, New Jersey, and New York elders and adults with physical disabilities. *Health Services Research*, 39: 643 – 64.

McAuley, W. J., & Blieszner, R. (1985). Selection of long-term care arrangements by older community residents. *The Gerontologist*, 25, 188–193. doi:10.1093/geront/25.2.188

Min, J. W. (2005). Preference for long-term care arrangement and its correlates for older Korean Americans. *Journal of Aging and Health*, 17: 363 – 95.

Pinquart, M., & Sörensen, S. (2002). Psychological outcomes of preparation for future care needs. *Journal of Applied Gerontology*, *21*(4), 452–470. https://doi.org/10.1177/073346402237632

Pressman, S. (2015). Defining and Measuring the Middle Class. American Institute of Economic Research. https://www.aier.org/wp-content/uploads/2016/10/WP007-Middle-Class.pdf

Roth, D. L., Fredman, L., & Haley, W. E. (2015). Informal caregiving and its impact on health: A reappraisal from population-based studies. *The Gerontologist*, *55*(2), 309–319. https://doi.org/10.1093/geront/gnu177

Stoller, E. P., & Cutler, S. J. (1993). Predictors of use of paid help among older people living in the community. *The Gerontologist, 33*(1), 31–40. https://doi.org/10.1093/geront/33.1.31

Tabira, T., Hotta, M., Murata, M., Yoshiura, K., Han, G., Ishikawa, T., Koyama, A., Ogawa, N., Maruta, M., Ikeda, Y., Mori, T., Yoshida, T., Hashimoto, M., & Ikeda, M. (2020). Age-Related Changes in Instrumental and Basic Activities of Daily Living Impairment in Older Adults with Very Mild Alzheimer's Disease. *Dementia and Geriatric Cognitive Disorders Extra*, *10*(1), 27–37. https://doi.org/10.1159/000506281

The AP-NORC Center for Public Affairs Research. (2021). Long-Term Care in America: Americans Want to Age at Home. https://www.longtermcarepoll.org/project/long-term-care-in-america-americans-want-to-age-at-home

Tyson, A., Funk, C., Kennedy, B., & Johnson, C. (2021). *Methodology*. Pew Research Center Science & Society. https://www.pewresearch.org/science/2021/09/15/covid19-restrictions-methodology/

U.S. Census Bureau. (2020). *Income and Poverty in the United States: 2019*. Census.Gov. https://www.census.gov/library/publications/2020/demo/p60-270.html

U.S. Department of Health and Human Services. (2019). What is the lifetime risk of needing and receiving long-term services and supports? Office of the Assistant Secretary for Planning and Evaluation.https://aspe.hhs.gov/reports/what-lifetime-risk-needing-receiving-long-term-services-supports-0

Wolff, J. L., Kasper, J. D., & Shore, A. D. (2008). Long-term care preferences among older adults: a moving target? *Journal of Aging & Social Policy*, *20*(2), 182–200. https://doi.org/10.1080/08959420801977574

Yeh, S., Wang, W., Chou, H., & Chen, S. (2021). Private Long-Term Care Insurance Decision: The Role of Income, Risk Propensity, Personality, and Life Experience. *Healthcare*, *9*(1), 102. https://doi.org/10.3390/healthcare9010102

Table 4a. Demographic and Functional Characteristics of Study Participants (*n*=3531*)*

Variable	Category	Frequency (n)	Percentage (%)
Concordance	Discordant	2219	62.8%
	Concordant	1312	37.2%
Income	Low	2010	56.9%
	Middle	1236	35.0%
	Upper	285	8.1%
Age Group	65-74	750	21.2%
	75-84	1740	49.3%
	85+	1041	29.5%
Race/Ethnicity	White	2549	72.2%
	Black	701	19.9%
	Other	281	8.0%
Gender	Male	1495	42.3%
	Female	2036	57.7%
Children	No	260	7.4%
	Yes	3271	92.6%
Marital Status	Married	1764	50.0%
	Single	1767	50.0%
Education	< HS	672	19.0%
	HS/Trade	1153	32.7%
	2-4 yrs	1180	33.4%
	> 4 yrs	526	14.9%
Insurance	No	1947	55.1%
	Yes	1584	44.9%
Dementia	No	3269	92.6%
	Yes	262	7.4%
Chronic Illness	None	160	4.5%
	1-2	1411	40.0%
	3+	1960	55.5%
ADL	None	1844	52.2%
	1-2	1038	29.4%
	3+	649	18.4%
IADL	None	1847	52.3%
	1-2	985	27.9%
	3+	699	19.8%

Note: ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living)

Table 4b. Aggregate Concordance of Preferred Care and Care Used Across Care Types (*n*=3531)

Preferred Care	Care Used				
	Unpaid home care	Paid home care	ALF	SNF	Total
Unpaid home care	954	226	44	20	1244
Row %	76.7%	18.2%	3.5%	1.6%	100.0%
Column %	36.7%	34.8%	20.5%	28.6%	35.2%
Sample %	27.0%	6.4%	1.3%	0.6%	35.2%
Paid home care	779	213	46	11	1049
Row %	74.3%	20.3%	4.4%	1.1%	100.0%
Column %	30.0%	32.8%	21.4%	15.7%	29.7%
Sample %	22.1%	6.0%	1.3%	0.3%	29.7%
ALF	662	155	125	19	961
Row %	68.9%	16.1%	13.0%	2.0%	100.0%
Column %	25.5%	23.9%	58.1%	27.1%	27.2%
Sample %	18.8%	4.4%	3.5%	0.5%	27.2%
SNF	202	55	0	20	277
Row %	72.9%	19.9%	0.0%	7.2%	100.0%
Column %	7.8%	8.5%	0.0%	28.6%	7.8%
Sample %	5.7%	1.6%	0.0%	0.6%	7.8%
Total	2597	649	215	70	3531
Row %	73.6%	18.4%	6.1%	2.0%	100.0%
Column %	100.0%	100.0%	100.0%	100.0%	100.0%
Sample %	73.6%	18.4%	6.1%	2.0%	100.0%

Note: Row % (% of each care type received within each preference category, Column % (% distribution of each care type across all preferences), Sample % (% the total sample that each cell represents); ALF (Assisted Living Facility), SNF (Skilled Nursing Facility)

Table 4c. Concordance of Preferred Care and Care Used Across Care Types,Stratified by SES (continued on next page)

Low SES (*n*=2010)					
Preferred Care	**Care Used**				
	Unpaid Home Care	Paid Home Care	ALF	SNF	Total
Unpaid Home Care	612	121	29	19	801
Row %	76.4%	17.6%	3.6%	2.4%	100.0%
Column %	42.3%	38.0%	22.8%	29.2%	39.9%
Sample %	30.5%	7.0%	1.4%	1.0%	39.9%
Paid Home Care	379	114	25	10	528
Row %	71.8%	21.6%	4.7%	1.9%	100.0%
Column %	26.2%	30.7%	19.7%	15.4%	26.3%
Sample %	18.9%	5.7%	1.2%	0.5%	26.3%
ALF	314	774	73	17	478
Row %	65.7%	15.5%	15.3%	3.6%	100.0%
Column %	21.7%	20.0%	57.5%	26.2%	23.8%
Sample %	15.6%	3.7%	3.6%	0.9%	23.8%
SNF	142	42	0	19	203
Row %	70.0%	20.7%	0.0%	9.4%	100.0%
Column %	9.8%	11.3%	0.0%	29.2%	10.1%
Sample %	7.1%	2.1%	0.0%	1.0%	10.1%
Total	1447	371	127	65	2010
Row %	72.0%	18.5%	6.3%	3.2%	100.0%
Column %	100.0%	100.0%	100.0%	100.0%	100.0%
Sample %	72.0%	18.5%	6.3%	3.2%	100.0%

Table 4c (continued)

Middle SES (*n*=1236)					
Preferred Care	**Care Used**				
	Unpaid home care	Paid home care	ALF	SNF	Total
Unpaid home care	294	69	13	1	377
Row %	78.0%	18.3%	3.5%	0.3%	100.0%
Column %	31.3%	31.1%	18.3%	20.0%	30.5%
Sample %	23.8%	5.6%	1.1%	0.1%	30.5%
Paid home care	314	80	17	1	412
Row %	76.2%	19.4%	4.1%	0.2%	100.0%
Column %	33.5%	36.0%	23.9%	20.0%	33.3%
Sample %	25.4%	6.5%	1.4%	0.1%	33.3%
ALF	276	62	41	2	381
Row %	72.4%	16.3%	10.8%	0.5%	100.0%
Column %	29.4%	27.9%	57.8%	40.0%	30.8%
Sample %	22.3%	5.0%	3.3%	0.2%	30.8%
SNF	54	11	0	1	66
Row %	81.8%	16.7%	0.0%	1.5%	100.0%
Column %	5.8%	4.9%	0.0%	20.0%	5.3%
Sample %	4.4%	0.9%	0.0%	0.1%	5.3%
Total	938	222	71	5	1236
Row %	75.9%	18.0%	5.7%	0.4%	100.0%
Column %	100.0%	100.0%	100.0%	100.0%	100.0%
Sample %	75.9%	18.0%	5.7%	0.4%	100.0%

Table 4c (continued)

Upper SES (*n*=285)					
Preferred Care	**Care Used**				
	Unpaid home care	Paid home care	ALF	SNF	Total
Unpaid home care	48	16	2	n/a	66
Row %	72.7%	24.2%	3.0%	n/a	100.0%
Column %	22.6%	28.6%	11.8%	n/a	23.2%
Sample %	16.8%	5.6%	0.7%	n/a	23.2%
Paid home care	86	19	4	n/a	109
Row %	78.9%	17.4%	3.7%	n/a	100.0%
Column %	40.6%	33.9%	23.5%	n/a	38.3%
Sample %	30.2%	6.7%	1.4%	n/a	38.3%
ALF	72	19	11	n/a	102
Row %	70.6%	18.6%	10.8%	n/a	100.0%
Column %	34.0%	33.9%	64.7%	n/a	35.8%
Sample %	25.3%	6.7%	3.9%		35.8%
SNF	6	2	0	n/a	8
Row %	75.0%	25.0%	0.0%	n/a	100.0%
Column %	2.8%	3.6%	0.0%	n/a	2.8%
Sample %	2.1%	0.7%	0.0%	n/a	2.8%
Total	212	56	17	n/a	285
Row %	74.4%	19.7%	6.0%	n/a	100.0%
Column %	100.0%	100.0%	100.0%	n/a	100.0%
Sample %	74.4%	19.7%	6.0%	n/a	100.0%

Note: Row % (% of each care type received within each preference category, Column % (% distribution of each care type across all preferences), Sample % (% the total sample that each cell represents); ALF (Assisted Living Facility), SNF (Skilled Nursing Facility)

Table 4d. Bivariate Analysis of Factors Associated with Concordance (*n*=3531)

Variable	**Category**	**Care Type Discordant: n= 2219**	**Care Type Concordant n=1312**	**Total: n=3531**	**Pearson Chi2 P-value**	**Odd Ratio (95% CI)**
Income	Low	1192(59.30%)	818(40.70%)	2010	28.96(0.000)	Ref
	Middle	820(66.34%)	416(33.66%)	1236		**0.74(0.64-0.86)**
	Upper	207(72.63%)	78(27.37%)	285		**0.55(0.42-0.72)**
Age Group	65-74	470(62.67%)	280(37.33%)	750	16.91(0.000)	Ref
	75-84	1145(65.80%)	595(34.20%)	1740		0.87(0.72-1.04)
	85+	604(58.02%)	437(41.98%)	1041		1.21(1.00-1.47)
Race/Ethnicity	White	1619(63.52%)	930(36.48%)	2549	2.46(0.292)	Ref
	Black	434(61.91%)	267(38.09%)	701		1.07(0.90-1.27)
	Other	166(59.07%)	115(40.93%)	281		1.21(0.94-1.55)
Gender	Male	959(64.15%)	536(35.85%)	1495	1.88(0.169)	Ref
	Female	1260(61.89%)	776(38.11%)	2036		1.10(0.96-1.27)
Children	No	171(65.77%)	89(34.23%)	260	1.03(0.310)	Ref
	Yes	2048(62.61%)	1223(37.39%)	3271		1.14(0.88-1.49)
Marital Status	Married	1158(65.65%)	606(34.35%)	1764	11.85(0.001)	Ref
	Single	1061(60.05%)	706(39.95%)	1767		1.27(1.11-1.46)
Education	< HS	380(56.55%)	292(43.45%)	672	16.15(0.001)	Ref
	HS/Trade	724(62.79%)	429(37.21%)	1153		**0.77(0.64-0.94)**
	2-4 yrs	768(65.08%)	412(34.92%	1180		**0.70(0.58-0.85)**
	> 4 yrs	347(65.97%)	179(34.03%)	526		**0.67(0.53-0.85)**
Insurance	No	1189(61.07%)	758(38.93%)	1947	5.86(0.016)	Ref
	Yes	1030(65.03%)	554(34.97%)	1584		**0.84(0.73-0.97**)
Dementia	No	2058(62.96%)	1211(37.04%)	3269	0.24(0.628)	Ref
	Yes	161(61.45%)	101(38.55%)	262		1.07(0.82-1.38)
Chronic Illness	None	95(59.38%)	65(40.62%)	160	1.12(0.571)	Ref
	1-2	882(62.51%)	529(37.49%)	1411		0.88(0.63-1.22)
	3+	1242(63.37%)	718(36.63%)	1960		0.84(0.61-1.17)
ADL	None	1170(63.45%)	674(36.55%)	1844	5.14(0.077)	Ref
	1-2	666(64.16%)	372(35.84%)	1038		0.97(0.83-1.14)
	3+	383(59.01%)	266(40.99%)	649		1.21(1.00-1.45)
IADL	None	1189(64.37%)	658(35.63%)	1847	5.81(0.055)	Ref
	1-2	616(62.54%)	369(37.46%)	985		1.08(0.92-1.27)
	3+	414(59.23%)	285(40.77%)	699		1.24(1.04-1.48)

Note: ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living). A p-value threshold of < 0.10 was considered statistically significant.

Table 4e. Odds Ratios (OR) for Factors Associated with Care Concordance Across all SES Categories

		Unadjusted		**Adjusted**	
Variable	**Category**	**Odds Ratio (95% CI)**	**P-value**	**Odds Ratio (95% CI)**	**P-value**
SES	Low	Ref	Ref	Ref	Ref
	Middle	0.79(0.66-0.95)	0.012	**0.75(0.64-0.87)**	**0.001**
	Upper	0.59(0.43-0.82)	0.002	**0.55(0.41-0.72)**	**0.000**
Age Group	65-74	Ref	Ref	Ref	Ref
	75-84	0.85(0.71-1.02)	0.088	**0.79(0.69-0.91)**	**0.001**
	85+	1.10(0.89-1.35)	0.357	1.23(1.05-1.45)	0.009
Race/Ethnicity	White	Ref	Ref	Ref	Ref
	Black	0.96(0.79-1.16)	0.697	–	–
	Hispanic/Other	1.05(0.81-1.38)	0.698	–	–
Gender	Male	Ref	Ref	Ref	Ref
	Female	1.01(0.86-1.18)	0.908	–	–
Children	No	Ref	Ref	Ref	Ref
	Yes	1.17(0.89-1.54)	0.256	–	–
Marital Status	Married	Ref	Ref	Ref	Ref
	Single	1.08(0.91-1.28)	0.377	–	–
Education	<HS	Ref	Ref	Ref	Ref
	HS/Trade	0.78(0.64-0.97)	0.022	**0.83(0.70-0.99)**	**0.035**
	2-4 yrs	0.78(0.63-0.98)	0.031	**0.84(0.71-0.99)**	**0.047**
	> 4 yrs	0.85(0.65-1.12)	0.255	1.05(085-1.30)	0.638
Insurance	No	Ref	Ref	Ref	Ref
	Yes	0.82(0.71-0.94)	0.008	**0.83(0.72-0.95)**	**0.008**
Dementia	No	Ref	Ref	Ref	Ref
	Yes	0.90(0.69-1.19)	0.475	–	–
Chronic Illness	None	Ref	Ref	Ref	Ref
	1-2	0.85(0.61-1.19)	0.365	–	–
	3+	0.76(0.54-1.07)	0.116	–	–
ADL	None	Ref	Ref	Ref	Ref
	1-2	1.04(0.87-1.25)	0.646	–	–
	3+	1.12(0.87-1.45)	0.384	–	–
IADL	None	Ref	Ref	Ref	Ref
	1-2	0.88(0.74-1.06)	0.173	–	–
	3+	1.01(0.78-1.31)	0.908	–	–

Note: ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living). The outcome variable 'Concordance' is coded ‘1’ for Concordant and ‘0’ for Discordant. A p-value threshold of < 0.10 was considered statistically significant.

Table 4f. Odds Ratios (OR) for Factors Associated with Care Concordance Comparing Middle-SES to Low-SES and Middle-SES to Upper-SES

	Middle Vs Low (n=3246)		**Middle Vs Upper (n=1521)**	
Variable	**UOR(95% CI), p-value**	**AOR(95% CI), p-value**	**UOR(95% CI) p-value**	**AOR(95% CI), p-value**
SES(Middle Vs Low)	0.79(0.66-0.95), 0.010	**0.75(0.64-0.87), 0.000**	**	**
SES(Middle Vs Upper)	**	**	1.24(0.92-1.68), 0.154	**1.29(0.97-1.72), 0.084**
Age (Ref: 65-74)	Ref	Ref	Ref	Ref
75-84	0.85(0.70-1.03), 0.099	**0.80(0.69-0.92), 0.002**	0.86(0.66-1.11), 0.258	**0.82(0.66-1.01), 0.066**
85+	1.09(0.88-1.35), 0.452	1.24(1.06-1.45), 0.008	1.11(0.79-1.56), 0.546	1.24(1.05-1.46), 0.008
Race (Ref: White)	Ref	Ref	Ref	Ref
Black	0.95(0.78-1.16), 0.620	–	0.96(0.64-0.43), 0.854	–
Hispanic/Other	1.02(0.78-1.34), 0.878	–	1.49(0.86-2.58), 0.152	–
Gender (Ref: Men)	1.01(0.86-1.18), 0.925	–	1.01(0.80-1.27), 0.932	–
Child (Ref: No)	1.16(0.87-1.53), 0.308	–	0.83(0.55-1.25), 0.375	–
Marital Status (Ref: Married)	1.07(0.90-1.27), 0.430	1.19(1.02-1.41), 0.029	1.28(0.97-1.68), 0.077	**1.26(0.98-1.62), 0.074**
Education (Ref: <HS)	Ref	Ref	Ref	Ref
HS/Trade	0.78(0.96-0.96), 0.020	**0.82(0.69-0.98), 0.026**	0.67(0.38-1.17), 0.16	–
2-4 yrs	0.77(0.62-0.96), 0.020	**0.81(0.68-0.97), 0.024**	0.67(0.39-1.15), 0.15	–
> 4 yrs	0.87(0.65-1.16), 0.338	0.93(0.75-1.14), 0.469	0.61(0.35-1.08), 0.090	–
Insurance (Ref: No)	0.80(0.69-0.93), 0.003	**0.80(0.69-0.93), 0.003**	0.89(0.71-1.11), 0.299	0.80(0.69-0.93), 0.003
Dementia (Ref: No)	0.90(0.68-1.18), 0.443	–	0.93(0.53-1.62), 0.803	–
Chronic Illness (Ref: None)	Ref	Ref	Ref	Ref
1-2	0.79(0.55-1.13), 0.203	–	0.91(0.58-1.43), 0.687	–
3+	0.73(0.51-1.04), 0.083	0.87(0.76-1.01), 0.072	0.77(0.48-1.21), 0.261	–
ADL (Ref: None)	Ref	Ref	Ref	Ref
1-2	0.88(0.73-1.06), 0.192	–	1.01(0.76-1.35), 0.931	–
3+	1.02(0.79-1.33), 0.871	–	1.14(0.72-1.79), 0.582	–
IADL (Ref: None)	Ref	Ref	Ref	Ref
1-2	1.07(0.89-1.29), 0.460	–	0.87(0.66-1.16), 0.346	1.02(0.87-1.19), 0.791
3+	1.11(0.85-1.44), 0.452	–	1.29(0.80-2.06), 0.294	**1.40(0.99-1.96), 0.054**

Note: ADL (Activities of Daily Living), IADL (Instrumental Activities of Daily Living). The outcome variable 'Concordance' is coded ‘1’ for Concordant and ‘0’ for Discordant. A p-value threshold of < 0.10 was considered statistically significant.

CHAPTER 5: SYNTHESIS

Summary of Findings

My research aimed to examine the association between socioeconomic status (SES) and various aspects of long-term services and supports (LTSS), exploring whether those in the middle class face unique barriers accessing care. Middle-income earners represent the largest segment of the U.S. population over age 65, yet there is a paucity of academic research examining this segment. To address this gap in the existing literature, I conducted three interrelated studies using SES as the independent variable of interest and controlled for predisposing, enabling, and need-based characteristics previously found to be associated with LTSS use.

For the first study, I examined the relationship between SES and informal and formal care utilization among older adults. This research was guided by two questions: “How do the types of LTSS used vary across the SES classes?” and “Do individuals in the middle-income SES have a greater propensity towards utilizing informal care compared to their counterparts?”. In response to the first research question, those in the middle and upper-SES groups had decreased odds of using informal care. Other factors inversely associated with informal care included being single, having higher levels of education, having insurance coverage, and having a greater number of chronic illnesses and ADL and IADL needs. Conversely, women and those with children had increased odds of using informal care. In response to the second research question, the findings yielded results similar to those in the model addressing the first research question, except for a few key differences. While individuals in the middle-SES group had decreased odds of using informal care compared to those in the lower-SES group, the association reversed when comparing the middle-SES to those in the upper-SES group, resulting in the middle-SES group having increased odds of using informal care. Blacks and those aged 75-84 also had increased odds of using informal care in the middle-to-upper-SES comparison but not in the middle-to-low-SES comparison. Additionally, those in the Other race category had decreased odds of using informal care in the middle-to-low-SES comparison but no significant association in the middle-to-upper-SES comparison. While women had increased odds of informal care in the overall model, sex was not associated with informal care in the individual SES group comparisons.

For the second study, I examined the relationship between SES and unmet care needs (UCN) among older adults. This research was guided by two questions: “How does unmet care need differ by socioeconomic status?” and “Are those in the middle class more likely to experience unmet care needs?”. In response to the first research question, my analysis revealed that UCN varied by SES, with middle-income older adults having increased odds of UCN compared to those in the low-SES group. Those in the upper-SES group also had increased odds of UCN, but the results were not statistically significant. Other factors such as IADL and ADL needs, being single, and having children were also associated with higher odds of UCN, while increased age and having only one or two chronic illnesses were associated with lower odds of UCN. The findings from the comparison of the middle and low-SES groups yielded results similar to those of the first research question. However, key differences emerged when comparing the middle-SES and upper-SES groups. With regard to age, those aged 85+ had significantly decreased odds of UCN. Among those aged 75-84, the odds of UCN increased, but the association was not statistically significant. Race was a significant factor in comparing the middle and upper-SES groups, with those in the Other race category having decreased odds of UCN. In comparing the middle and upper-SES groups, having children was not associated with UCN. Other factors such as IADL and ADL needs, being single, and having one or two chronic illnesses had associations similar to those in the comparison of the middle-SES and low-SES groups.

For the third study, I examined the relationship between SES and concordance between care preferences and utilization. This research was guided by two questions: “How does care concordance differ by socioeconomic status?” and “Are those in the middle class less likely to use care concordant with their preference?". In response to the first research question, I found that those in the middle and upper-SES groups had decreased odds of care concordance compared to those in the low-SES group. Other factors significantly associated with reduced odds of concordance were age (75-84 years), education (high school or 2-4 years of college), and having insurance to assist with long-term care. No factors were significantly associated with increased odds of concordance. In response to the second research question, comparing the middle and low-SES groups and the middle and upper-SES groups revealed distinct differences. When comparing the middle and low-SES groups, those in the middle-SES group had decreased odds of concordance. Similar to the model comparing all SES groups, age (75-84 years), education (high school or 2-4 years of college) and having insurance to assist with long-term care were significantly associated with decreased odds of concordance. No factors were associated with increased odds of concordance. When comparing the middle and upper-SES groups, the only similarity was the age-related association. Neither education nor insurance were significant factors when comparing those in the middle-SES group to the upper-SES group. Being single and having three or more IADL needs were significantly associated with increased odds of concordance when comparing the middle and upper-SES groups but not when comparing the middle and lower-SES groups.

Strengths and Limitations

These studies collectively contribute to a gap in the existing U.S.-based research by examining the relationship between SES and various aspects of LTSS utilization, focusing on the middle-class demographic. The study employed a comprehensive approach by controlling for numerous predisposing, enabling, and need factors previously associated with LTSS use. My research's methodological rigor involved employing logistic regression analysis with backward elimination. This approach not only lent credibility to my findings but also ensured the inclusion of only statistically significant variables despite their potential theoretical significance. In addition, using individual regression models to separately compare those in the middle-SES group to those in the low and upper-SES groups provided additional detail that would have been lost by creating a combined upper and lower referent group or using the middle-SES as the referent group. Lastly, conducting a sensitivity analysis using different income measures for SES did not yield meaningful results that differed from those presented. The only exception was related to UCN, in which income had no significant association when using different income measures. The findings from my research provide a foundation for future research on a segment of older adults currently under-represented in long-term care research.

While each study has distinct limitations, several were present across all three studies. First, the cross-sectional nature of these analyses does not allow for a determination of causality, nor do they capture changes that occur over time. The latter is especially important when studying an older demographic in a transitional state of need. Second, NHATS relies on self-reported data, which can result in recall and social desirability biases. Third, despite carefully selecting control variables that align with the theoretical framework, unrepresented variables that could bias the overall results likely exist. Lastly, considerable variability in how

SES is measured exists across different studies. This variability can complicate comparisons across studies and may affect the consistency of findings.

Overall Innovation

To the best of my knowledge, these three studies are the first to explore the relationship between SES and variations in LTSS utilization, emphasizing potential disparities those in the middle class face. While previous research has used elements of SES as control variables, my research is the first to use SES, represented by household income, as the primary variable of interest.

Implications

Collectively, my three studies highlight various factors associated with access to and utilization of LTSS, suggesting that affordability may contribute to increased reliance on informal care networks, increased risk of unmet care needs, and decreased concordance between preferred care and actual care used. Despite possessing more financial resources than their lower SES counterparts, the middle-SES group appears to encounter barriers in accessing LTSS that adequately meet their needs or align with their preferences. These findings establish a foundation for further examination of the challenges those in the middle-class face in accessing LTSS. The current system, which primarily caters to low-income individuals eligible for Medicaid, leaves a substantial portion of the population underserved. The need for more intricate policy solutions that provide equitable access to LTSS, bridging the gap between Medicaid and high-cost private care, is clear. However, these studies also highlighted a range of predisposing, enabling, and need-based factors associated with access to LTSS, which varied by the context of the study. Policymakers, practitioners, and individuals need to consider these multifaceted influences on LTSS decisions. Funding additional research to explore these influences will help guide the development of a more equitable long-term care support system that recognizes and accommodates the diverse needs and preferences of our aging population.

Related to differences in informal and formal care, the influence of marital status and having children on informal care use highlights the importance of considering family structure and dynamics in LTSS planning, such that single individuals and those without children may need additional resources and support when faced with LTSS needs. The varied impact of racial and ethnic identities on formal and informal care use calls for culturally sensitive policies that acknowledge and address the diverse needs of our aging population, particularly as the population over age 65 becomes more racially and ethnically diverse. Lastly, the role of insurance in facilitating access to formal care emphasizes the importance of insurance coverage in the broader context of LTSS accessibility. A universal approach to long-term care coverage beyond Medicaid and private LTC insurance may be necessary to reduce reliance on informal care networks and improve access to formal care options.

Regarding UCN, the middle class having increased odds of UCN suggests a need for policy adjustments and service provisions that specifically address the needs of older adults in this demographic who may face financial barriers in accessing care not encountered by those in the other SES brackets. The unexpected finding related to increased odds of UCN among those with children highlights the need for future research exploring the dynamics of adult children as caregivers. The most pronounced associations were among those with ADL and IADL needs. These associations persisted for both the middle and upper-SES groups, with odds of UCN substantially higher among these groups compared to the low-SES group. This finding warrants further examination of whether public assistance programs for low-income groups provide a protective buffer from UCN. Further research is also warranted to examine the role of informal care networks and UCNs, especially if informal caregivers struggle to meet the needs of those with more impairments.

Regarding differences in concordance, the findings raise concerns about individuals' ability to access preferred care types, emphasizing the need for further research to guide policies and practices that better align LTSS options with the preferences of diverse socioeconomic groups. The absence of association with any need-related factors suggests that financial resources and other SES-related variables, such as education and insurance status, play a greater role than need in determining whether individuals can access the care they prefer. Initiatives to improve concordance should consider the factors that impact individual autonomy in LTSS decision-making. Such initiatives might include increased education and awareness focused on planning for future care needs, understanding care options, and preparing financially.

The context-specific influences on LTSS utilization highlight the necessity for tailored interventions that address the needs of different demographics. The variability of associations suggests that strategies effective in one domain, such as addressing unmet care needs, may not directly translate to others, such as aligning care with individual preferences. These findings also highlight the complexity of the LTSS decision-making processes, which challenges providers and policymakers to consider the intricate interplay of variables that influence LTSS decisions and outcomes.

Future Research

While these three studies have many similarities, the lack of consistent associations establishes a foundation for further research. First, due to the dynamic versus static nature of LTSS utilization, each study should be replicated with a longitudinal design to account for changes over time. Second, qualitative research, including interviews and focus groups, could provide a deeper understanding of the nuanced findings of these quantitative studies. Third, future research should replicate these studies using Medicaid-Medicare dual-eligible enrollees as the referent group to determine if Medicaid provides a protective benefit, resulting in disparities in access for those who are ineligible. Fourth, socioeconomic status is a complex variable with varied applications in research. Future research may consider different approaches to how the measure of SES is constructed to see if the findings from this analysis are consistent across different measures of SES. Lastly, future research should explore broader sets of influencing factors not captured in these studies. This exploration could uncover critical insights, allowing for more effective targeting and design of interventions and policies.

Conclusion

The exploratory nature of my research establishes a foundation for further examination of the intricate relationship between SES and LTSS utilization. The findings suggest that financial resources alone do not guarantee or prevent access to care, and further investigation of the diverse, context-specific factors associated with LTSS use is needed. This research provides a foundation for exploring more inclusive and effective long-term care policies and interventions tailored to the nuanced needs of varied demographics.

APPENDIX: RESEARCH PROTECTIONS AND INTEGRITY

UNIVERSITY OF NORTH CAROLINA
CHARLOTTE
DIVISION OF RESEARCH

To: Lori Eberly

Public Health Sciences

From: Office of Research Protections and Integrity

Date: 21-Sep-2023

RE: Determination that Research is not Human Subjects and does not require IRB Approval

Study #: IRB-24-0210

Study Title: Long-Term Care in the United States: Examining the Role of Socioeconomic Status

The Office of Research Protections and Integrity has reviewed this submission and determined that it does not constitute human subjects as defined under federal regulations 45 CFR 46.102(e) and 21 CFR 56.102(e). 45 CFR 46 defines Human subject as a living individual about whom an investigator (whether professional or student) conducting research (i) Obtains information or biospecimens through intervention or interaction with the individual and uses, studies, or analyzes the information or biospecimens; or (ii) Obtains, uses, studies, analyzes, or generates identifiable private information or identifiable biospecimens. The information the Investigator will receive is not individually identifiable nor can the Investigator readily ascertain the identity of the subject.

Study Description:

Examine relationship between socioeconomic status and type of long term care used, unmet care needs, and concordance between care preferences and care used. 3 Manuscript model: Study One Q1: How do types of LTSS used differ by socioeconomic status? Q2: Are middle-class older adults more likely to use informal care? Study Two Q1: How does unmet care need differ by SES? Q2: Is the middle-class more likely to have unmet care needs? Study Three Q1: How does concordance of LTSS preference and LTSS used differ by socioeconomic status? Q2: Is the middle-class less likely to use care concordant with their preference?

You must inform the IRB of any changes to the project so that the IRB can determine whether the changes impact this non-human subjects determination.

Please be aware that approval may still be required from other relevant authorities or "gatekeepers" (e.g., school principals, facility directors, custodians of records), even though IRB approval is not required.