Title

Disability Status, Financial Strain, and Health and Well-being Among Older Adults and Adults with Disabilities in California

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Publication Date

2023

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA

Los Angeles

Disability Status, Financial Strain, and Health and Well-being Among Older Adults and Adults with Disabilities in California

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Social Welfare

by

Lei Chen

2023

ABSTRACT OF THE DISSERTATION

Disability Status, Financial Strain, and Health and Well-being
Among Older Adults and Adults with Disabilities
in California

by

Lei Chen
Doctor of Philosophy in Social Welfare
University of California, Los Angeles, 2023
Professor Fernando M. Torres-Gil, Chair

Aging and disability are essential aspects of social welfare. Long-Term Services and Supports (LTSS) are a big concern for older adults and adults with disabilities. These people are usually vulnerable to financial strain, which may exacerbate their health and well-being. Drawing from Pearlin's Stress Process Model, this study used data from the first cycle (2019-2020) California Long-Term Services and Supports survey to examine the direct and indirect associations between disability status, financial strain, and health and well-being of older adults and adults with disabilities. It also explored potential age and racial/ethnic disparities and investigated whether acute stress resulting from the COVID-19 pandemic may differentiate these associations. This study used multiple methods of descriptive analyses and Conditional Process Analysis to examine the hypothesized associations.

Significant indirect associations were found between disability status and health and well-being through financial strain. The indirect effect between having difficulty doing errands alone and serious psychological distress through financial strain was significantly stronger for young participants than middle-aged participants. People with different types of disability difficulties tended to experience various financial difficulties related to housing, food, and retirement savings and presented different reports of self-rated health and serious psychological distress. Several focal associations were significantly stronger for young participants and certain racial/ethnic groups than for middle-aged or older participants and other racial/ethnic groups. The pandemic-related stressor interacted with age and race/ethnicity to differentiate the association between having difficulty doing errands alone and serious psychological distress, and the association between financial strain and serious psychological distress.

The study contributes to the literature by applying Pearlin's Stress Process Model to people with LTSS needs. It also provides empirical evidence for health disparities by examining people with various disability difficulties. The findings can be used to guide state funding and target social services, programs, and policies to meet the diverse financial needs of people with LTSS needs. It can also contribute to efforts to rebalance programs essential to improving the efficiency of LTSS networks. Moreover, the study findings can provide insights into other state and federal LTSS programs, such as Medicaid.

The dissertation of Lei Chen is approved.

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2023

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ACKNOWLEDGEMENTS

I want to express my deepest gratitude to my mom and dad for their selfless support throughout my Ph.D. journey. The challenges imposed by the pandemic made our time apart even more difficult, but finally reuniting after three long years brought immeasurable joy to my heart. I feel incredibly blessed to have you here with me in LA, and your presence at my graduation ceremony fills me with gratitude. One of the driving forces behind pursuing this Ph.D. was to make you proud. I aspire to use the skills and passions I have developed during my doctoral studies to better care for you and other older adults like you. I would also like to extend my special thanks to my little aunt, Yi Liu, whose unwavering support gave me the courage to embark on this Ph.D. journey.

To Dr. Fernando Torres-Gil, I am deeply grateful for being one of the last doctoral students before your retirement. I still vividly remember the day you gave me the Ph.D. offer, which happened to be on Valentine's Day in 2016. Choosing UCLA and having you as my advisor for the past six years has been one of my best decisions. Your dedication to teaching, mentoring, and commitment to service have inspired me to strive for excellence as a scholar like you. It is a tremendous honor for me to graduate at the same time as your retirement, and I wish you a retirement filled with joy and fulfillment alongside your wife.

I would like to express my sincere appreciation to my dissertation committee members: Dr. Kathryn Kietzman, Dr. Teresa Seeman, Dr. Laura Wray-Lake, Dr. Wesley Yin, and Dr. Fernando Torres-Gil. Your consistent support and guidance during my dissertation process have been invaluable. I am also grateful to the professors and staff at the Luskin School of Public Affairs. Thank you to Dr. Lene Levy-Storm for providing me with my first graduate research assistant at UCLA. I eagerly anticipate future collaborations with you.

During my Ph.D. study, I have been fortunate to work at the UCLA Center for Health Policy Study, where I received tremendous guidance and support. Steve, I am deeply honored to receive the inaugural Steven P. Wallace Emerging Advocate Award from APHA. This recognition will forever remind me to follow in your footsteps as a mentor and scholar, applying evidence-based research to inform policies and practices. Kathryn, your steady support and kindness have meant the world to me. It has been my great fortune to work with you on the RIGHTS and LTSS projects, and I eagerly look forward to our continued collaboration. Maria-Elena, you enrolled me in the center, and I have thoroughly enjoyed working with you on the RIGHTS project. I am particularly grateful for our intellectual discussions and your assistance enhancing my academic writing. Nady, May, and Ninez, it has been a pleasure working with you on the RIGHTS study, and I hope to maintain our connection in my future endeavors. Moreover, I appreciate the center awarding me the UCLA Data Access Center Student Scholarship to support my dissertation data analyses.

I want to thank all my friends: Jianchao, Faye, Danjing, Hanchen, Wenxi, Jian, Yun, Hang, Huixuan, Jiang, and my friends in China. You always put up with me during the challenging moments of my Ph.D. journey, and I cannot imagine having gone through this experience without your companionship.

Last but certainly not least, I want to especially thank my husband Haoran, and my beloved dog Uno. Haoran, your unwavering love has brought immense joy and stability to my life. It is nice to grow together with you throughout my Ph.D. journey. Uno, I am grateful to be your mom and for the unconditional love and companionship you have provided. Your presence has been a constant source of comfort and support, and I am grateful for the joy you both have brought into my life.

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Chen, L. Allen, R., Kietzman, K. (2021, November). Disparities in financial strain for older adults and people with disabilities in California. Oral presentation at the 2021 Gerontological Society of America (GSA) Annual Scientific Meeting (Virtual meeting).

Chen, L. Young, M.E.D.T., Kietzman, K., Rodriguez, M.A. (2021, October). Exclusionary experiences of law enforcement and the avoidance of public benefits among immigrants in California. Oral presentation at the 2021American Public Health Association (APHA) Annual Meeting and Expo (Virtual meeting).

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Introduction

Background

The issues of aging and disability are essential aspects of social welfare. Older adults and people with disabilities of all ages (e.g., children born with intellectual or developmental disabilities; certain working-age adults with inherited or acquired disabling conditions, such as mental illness or traumatic brain injury; and older adults with chronic conditions or diseases) require Long-term Services and Supports (LTSS) (Congressional Research Service, 2021). LTSS refers to a broad range of health and health-related services and supports needed by individuals who lack the capacity for self-care due to a physical, cognitive, or mental disability or condition (Congressional Research Service, 2021). The bedrock of LTSS is assistance with the daily tasks of dressing, bathing, eating and other activities of daily living (ADLs). These individuals often require assistance with other routine tasks such as cooking, cleaning, medication management and other instrumental activities of daily living (IADLs) (Kane & Cultler, 2015).

Recent estimates have indicated that about 14 million adults in the U.S. need LTSS, and around 56% are older adults aged 65 and over (Congressional Research Service, 2021). The aging of the 'baby-boomer' population and dementia related to Alzheimer's disease play a major role in the increase in demand for LTSS (Thach & Wiener, 2018). Apart from older adults, younger individuals with disabilities also need LTSS. In 2018, approximately 6.1 million adults younger than 65 were estimated to require LTSS in the U.S. (Hado & Komisa, 2019). Although adults with physical disabilities are important users of LTSS, the population of individuals with intellectual and developmental disabilities (IDD) is also expected to grow substantially over time. In 2013, estimates of the total number of Americans with IDD were as high as 6.2 million

persons (Larson et al., 2016). Life expectancy among individuals with IDD has continued to increase, making LTSS more essential to supporting individuals with IDD, most of whom live in the community with their families (Larson et al., 2016).

Due to the increased demand for LTSS, people have expressed widespread concerns about becoming disabled as LTSS may not always be available, appropriate, or accessible (Khatutsky et al., 2017). Older adults and people with disabilities who need LTSS are often confronted with fragmented, inefficient systems that have many problems, including expensive payments in nursing homes and high out-of-pocket payments for LTSS (Genworth Financial, 2014; Greene et al., 2016). The costs of LTSS are beyond the reach of most individuals and their families. Medicare does not cover most LTSS, and only a small percentage of people choose to purchase long-term care insurance (Chen & Kietzman, 2022; Congressional Research Service, 2021). Medicaid provides coverage for some, but not all the LTSS that people need (Chen & Kietzman, 2022; Congressional Research Service, 2021). Younger individuals with disabilities and older adults account for 56 percent of total Medicaid LTSS and medical expenditures (Thach & Wiener, 2018). LTSS can be in both home- and community-based and institutional settings (e.g., nursing homes and assisted living) (Shippee et al., 2020). Financing and delivery systems for LTSS have historically favored institutional settings, although federal and state policies and advocacy efforts have facilitated a shift toward the use of greater home and community-based services (HCBS) (Eiken et al., 2014; Thach & Wiener, 2018).

Becoming disabled and needing LTSS may have profound financial and health-related implications (Khatutsky et al., 2017). Compared with the general public, people with disabilities are more likely to experience poorer health outcomes and adverse socioeconomic outcomes, such as lower levels of education, lower levels of employment, higher poverty rates, and insecurity in

food, housing, and employment (Braithwaite & Mont, 2009; Krahn et al., 2015; The World Bank, 2021). People living in impoverished communities have undesirably high numbers of people living with disabilities, who in turn are more vulnerable to poor health because of lack of access to healthcare and other reliable and important supports and services (Frier et al., 2018). People who need LTSS have high rates of economic hardship, even those with substantial financial resources (Chen & Kietzman, 2022; Johnson et al., 2021).

The World Health Organization's (WHO) definition of 'disability' acknowledges that "Disability is a complex phenomenon, reflecting an interaction between features of a person's body and features of the society in which he or she lives" (Frier et al., 2018, p. 538). Therefore, the social contexts and personal characteristics of people with LTSS needs should be considered when examining the financial concerns and health status of this population. Compared with older adults aging into disabilities, disabled young and middle-aged adults will have LTSS needs for long periods as they age with disabilities. It is essential to ensure that younger people with disabilities are not ignored relative to their more numerous older counterparts. Moreover, subgroups of older adults and adults with disabilities, such as racial/ethnic minorities, may be at significant risk of experiencing a range of financial difficulties (e.g., lack of income, unaffordable housing, insufficient food) and worry about being able to make ends meet; therefore, they may have more health problems. Apart from looking at a general population with LTSS needs, it is important to examine potential differences or disparities for this population when examining their financial strain and health and well-being.

LTSS in California

California has almost 8 million people who are either older adults or individuals with mobility, sensory, intellectual, developmental, or mental health disabilities (California Aging and Disability Alliance, 2019). Twenty-three percent of adults in California have some type of disability (Centers for Disease Control and Prevention, 2020). One study found that 58% of California participants felt "not very prepared" or "not at all prepared" financially if they needed LTSS "right now" (Lake Research Partners and American Viewpoint, 2010). The ability to pay for LTSS is a major concern for older adults and people with disabilities (Khatutsky et al., 2017). It has been emphasized that older adults and people with disabilities should be looked at together due to their high unmet needs in LTSS, housing, caregiving, and financial support (CA Action Day for all Ages and Abilities, 2022). It is important to dismantle aging and disability silos and create more coordinated LTSS networks for persons with disabilities of all ages (Putnam, 2014). Not having sufficient financial resources to maintain an acceptable quality of life is one of many concerns facing older adults and people with disabilities, especially those who suffer from the stress of paying for rent, food, and medical care. The population aged 60 years and over in California is expected to grow more than three times as fast as the total population. In California, the fastest growth in the older adult population will be among older adults of color (California Department of Finance, 2017). Moreover, California has the second-highest rate of poverty among older adults in the country. Approximately 20 percent of all people 65 and over in California live in poverty (United States Census Bureau, 2019). The portion of Black, Indigenous, and Latinx older adults living in poverty is double this percentage (California Department of Aging, 2021). Therefore, it is vital to address the racial/ethnic differences in financial difficulties for people with LTSS needs in California.

In June 2019, California Governor Gavin Newsom issued an executive order to create a Master Plan for Aging in California. This executive order affirmed the priority of health and well-being for all Californians and the need for policies that promote healthy aging. As called for in this Executive Order, an LTSS subcommittee was formed to affirm the importance of equity in addressing the LTSS needs of older adults and people with disabilities, as well as to provide specific recommendations to eliminate disparities and increase equity, accessibility, and affordability in the LTSS system. The Master Plan on Aging in California also seeks to understand the financial pressures and strains that impact the mental health and well-being of older adults and people with disabilities. Moreover, in response to the pressure of increasing LTSS needs in California, the state passed AB 567 (Chapter 746, Statutes of 2019), establishing the Long-term Care Insurance Task Force in the California Department of Insurance. The Task Force has explored the feasibility of developing and implementing a statewide LTSS insurance program in 2022 and submitted its recommended options to the Governor and the Legislature in 2023 (Keenan, 2023). Another event called "CA Action Day for all Ages and Abilities" (September 2022) emphasized the importance of providing data and evidence-based research to address issues facing people with LTSS needs. Given the lack of research on LTSS issues, this study seeks to provide evidence-based practice and policy suggestions to state administrators and policymakers and help them better use public funds to serve diverse older adults and people with disabilities in California.

COVID-19 Pandemic and LTSS

The COVID-19 pandemic highlighted the inequities and dilemmas facing diverse older adults and adults with disabilities. It exacerbated the economic anxiety of people with LTSS

needs and dramatically revealed the shortcomings in California's LTSS system. The pandemic has brought unique challenges to individuals of all ages utilizing LTSS: Older utilizers are at a high risk of COVID-19 infection and premature death (Shippee et al., 2020). Families with young children with intellectual and developmental disabilities expressed concern about the long-term impacts of the pandemic on their children's development, given the loss of services, education, and social engagement opportunities (Neece et al., 2020). People with LTSS needs are reliant on caregivers, which indirectly increases their exposure to COVID-19 due to their inability to socially distance themselves from their caregivers (Shippee et al., 2020). Measures such as physical distancing or self-isolation might disrupt service provisions of disability services, including the delivery of food, medication, and personal care (Armitage & Nellums, 2020). Although the ultimate health impact of the pandemic is still unknown, one consequence of the pandemic is certain: the longer the virus spreads, the greater number of people will experience significant financial strain as well as anxiety and depression (Elbogen et al., 2020). The racial/ethnic disparities in financing, access, quality, and service delivery have increased during the COVID-19 pandemic, with emerging data showing that people of color and Indigenous people have a higher burden of illness and death from COVID-19 than their white peers (Dawson et al., 2021; Hedgpeth et al., 2020; Scott, 2020; Shippee et al., 2020). Therefore, it is urgent and with a timely need to examine how the COVID-19 pandemic highlights the inequities and policy or service dilemmas facing diverse older adults and adults with disabilities, which may worsen their financial strain and subjective health and well-being.

Description of the Study

Drawing from Pearlin's Stress Process Model (Pearlin, 1989), this study used a Californian population-level survey to examine the associations between disability status, financial strain, and subjective health and well-being for older adults and adults with disabilities, the groups of people with high needs for LTSS. This study also explored age and racial/ethnic disparities in these associations because subgroups of older adults and adults with disabilities (e.g., young adults or racial/ethnic minorities with disabilities) may be at greater risk of experiencing diverse financial difficulties (e.g., in housing, food, medical care) and worry about being able to make ends meet, thus causing more health problems. Moreover, this study examined a comparison before and during the pandemic on the proposed associations. The data used are from the first cycle (2019-2020) California Long-Term Services and Supports (CA-LTSS) survey and selected variables from the 2019-2020 California Health Interview Survey (CHIS). Descriptive analyses and multivariate analyses, including Conditional Process Analysis (CPA) were used to examine the hypothesized associations. The four sets of main research questions are located below. Specific hypotheses for each research question are shown in later sections.

Question 1: To what extent did the effects of people's disability status on their subjective health and well-being operate through financial strain?

Question 2-1: How did the direct associations between people's disability status, financial strain, and subjective health and well-being change before and during the COVID-19 pandemic?

Question 2-2: How did the direct associations between their disability status, financial strain, and subjective health and well-being differ by age and race/ethnicity?

Question 3-1: How did the direct associations between people's disability status, financial strain, and subjective health and well-being differ by the interaction between the COVID-19 pandemic and age? Question 3-2: How did the direct associations between people's disability status, financial strain, and subjective health and well-being differ by the interaction between the COVID-19 pandemic and race/ethnicity?

Question 4-1: How did the COVID-19 pandemic change the effects of people's disability status on their subjective health and well-being through financial strain? Question 4-2: How did people's age or race/ethnicity differentiate the effects of people's disability status on their subjective health and well-being through financial strain?

Review of the Literature

This study is informed by Pearlin's (1989; 1990; 1997; 2005; 2013) Stress Process Model and previous studies' findings related to financial strain, stressful life events of pandemics, and their associations with people's disability status and health and well-being. Previous research has also examined variations of age and race/ethnicity among certain associations which further inform the exploration of disparities in age and race/ethnicity in this study. Based on the theoretical framework and previous studies, this study identified three research gaps including (1) lack of an overarching measure of financial strain addressing multiple dimensions of daily lives for people with LTSS needs; (2) lack of investigating effects of chronic (financial strain) and acute (COVID-19 pandemic-related stress) stressors simultaneously; (3) a lack of studies comprehensively examining diversities of age and race/ethnicity in financial strain and subjective health and well-being for people with LTSS needs.

Description of the Theoretical Framework

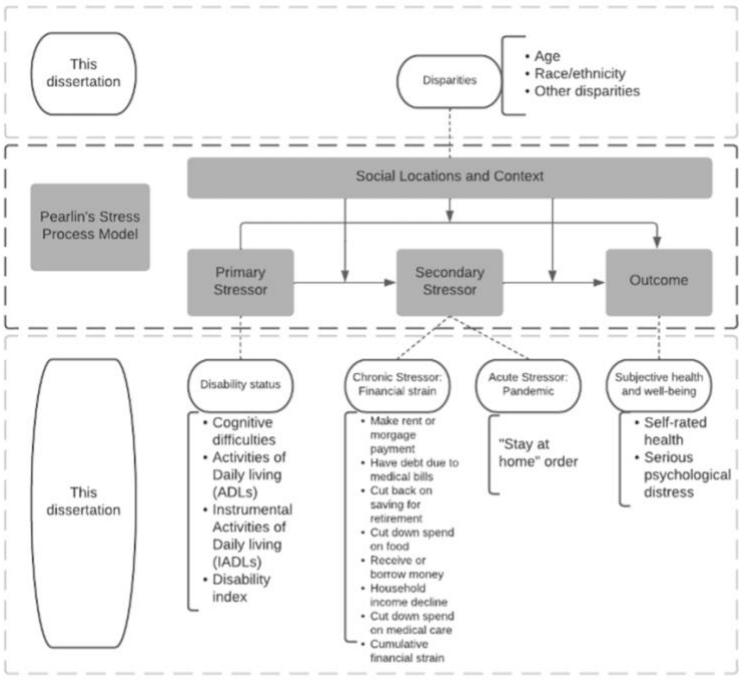
The theoretical framework (Figure 1) of the study is informed by Pearlin's (1989; 1990; 1997; 2005; 2013) Stress Process Model, a leading framework in the social sciences that links psychosocial factors to health (Brown & Hargrove, 2018). The framework posits that individuals' social locations and contexts expose them to varying stressor levels, which impact their health outcomes (Pearlin, 1989; Vargas et al., 2019). The outcomes in the Stress Process Model can be assessed through direct observation, medical records, or self-reported measures (Pearlin, 1989). Studies using Pearlin's Stress Process Model have included health outcomes such as physical health, quality of life, depression, anxiety, physiological reactions, and life satisfaction (Dawson et al., 2013; Pearlin et al., 1990; Pearlin et al., 1997; Roland & Chappell, 2019). Observing multiple outcomes is highly desirable because people with different social and economic characteristics may also have different modes of manifesting stress (Dawson et al., 2013). Financial strain was found to be strongly associated with subjective measures of health and well-being; however, it had a weaker association with more objective measures, such as performance-based mobility and mortality (Angel et al., 2003). Therefore, this study used two subjective health and well-being measures (i.e., self-rated health and serious psychological distress) to operationalize the study's primary outcome.

Figure 1 shows how Pearlin's Stress Process Model informs the theoretical framework of the study. The varying stress levels can be accessed on two dimensions: primary/secondary stressors and chronic/acute stressors. In Pearlin's Stress Process Model, the secondary stressors exacerbate stress, which reflect the expansion or emergence of stressors within and beyond the primary stressor (Pearlin et al., 1997; Vargas et al., 2019). The social locations and context are conceived as disparities affecting each of the other components of the stress process: the primary and

secondary stressors to which people are exposed and the outcomes they exhibit (Pearlin et al., 1997). In this study, financial strain experienced by people with LTSS needs is treated as a chronic stressor, which is an enduring problem. COVID-19 pandemic-related stress is treated as an acute stressor, which is a sudden outbreak. Informed by Pearlin's Stress Process Model, the study examines how financial strain (secondary and chronic stressor) may exacerbate stress for people with different types of disabilities (primary stressor) on their subjective health and well-being (outcome). The study also explores how disparities in age and race/ethnicity (social locations and context) may influence the experiences of stress and associated outcomes of health and well-being. Moreover, this study compares these associations in the periods before and during the COVID-19 pandemic (secondary and acute stressor).

Figure 1

Theoretical Framework Informed by Pearlin's Stress Process Model



Primary Stressor: Disability Status

Pearlin's Stress Process Model regards primary stressors as hardships rooted in the situation whose effects are under study (Pearlin et al., 1997) and that drive the process that follows (Pearlin et al., 1990). Primary stressors are likely to be durable and intensify over time, thus producing other stressors called secondary stressors (Pearlin et al., 1990). In this study, the primary stressor refers to the individual's disability status, including physical and mental impairments that limit a person's ability to participate in daily life activities. There are multiple ways to define and categorize disability status. The study analyses focus on people with severe cognitive impairments, or those who have difficulties in ADLs or IADLs. This definition is similar to the eligibility requirement for benefits under tax-qualified long-term care insurance policies as specified in the Health Insurance Portability and Accountability Act of 1996 (Johnson et al., 2021).

The latest definition of health disparities used by Healthy People 2020–the national disease prevention and health promotion agenda for the United States–has now expanded to specifically include people with disabilities as a health disparities population (Goode et al., 2014). People with disabilities experience a high incidence of secondary conditions, such as depression and anxiety, that can negatively affect their health (Angelelli et al., 2022; Drum et al., 2008; Kinne et al., 2004). Subjective well-being decreased with the severity of disability, but was found to be independent of the type of physical disability (Uppal, 2006). Moreover, people with disabilities are more likely to suffer financial strain than people without disabilities, a phenomenon that has been demonstrated in previous studies. For example, people with disabilities may have extra costs resulting from disability (e.g., costs associated with medical care or assistive devices or the need for personal support and assistance) (World Health Organization, 2011). Thus, they often

require more resources to achieve the same outcomes as non-disabled people. Moreover, people with disabilities have reduced employment and earning opportunities, which further affected their abilities to afford the additional costs (Khayatzadeh-Mahani et al., 2020). Because of high costs, people with disabilities and their households have been likely poorer than non-disabled people with similar incomes (Braithwaite & Mont, 2009; Cullinan et al., 2011; Zaidi & Burchardt, 2005). Families with disabled children have experienced significantly greater financial hardships, including food insecurity, housing instability, and healthcare access than those who do not have disabled children (Fujiura & Yamaki, 2000; Parish et al., 2008; Scherer et al., 2019). Financial strain and depression were found to be generally substantially elevated among those with physical disabilities (Turner & Turner, 2004). In addition, the COVID-19 pandemic has put people with disabilities at risk of increased morbidity and mortality (Armitage & Nellums, 2020). People with disabilities are believed to have a range of functional impairments but are not necessarily at higher risk of directly contracting COVID-19. However, they were reliant on caregivers, which indirectly increases their exposure to COVID-19 due to their inability to keep social distance from their caregivers (Shippee et al., 2020). Therefore, people with disabilities may be more vulnerable to the COVID-19 pandemic, which may result in adverse subjective health and well-being outcomes. Disability disparities research remains little recognized within the broader health disparities field (Goode et al., 2014). It is worthwhile to examine the disparities of disabilities on financial strain and subjective health and well-being for people with LTSS needs.

Secondary Stressors: Financial Strain and COVID-19 Pandemic-related Stress

In Pearlin's Stress Process Model, secondary stressors result from primary stressors but arise in roles or activities outside of primary stressors. The model reflects how stressors in one domain may give rise to those in other domains (Pearlin et al., 1997). In this study, the secondary stressors include experiences of financial strain (chronic stressor) and COVID-19 pandemic-related stress (acute stressor) that may accelerate stress for people who have disabilities. The distinction between acute and chronic stress has important theoretical implications for studying emotional and physical health (Pearlin, 1989).

Chronic Stressor: Financial Strain. The type of chronic strains that manifest as stressors involve the relatively enduring problems, conflicts, and threats that many people face in their daily lives (Pearlin, 1989). There is perhaps no condition that better exemplifies these kinds of stressors than economic deprivation and its attendant strains (Pearlin et al., 2005). Financial strain is defined as an economic stressor that can have particularly noxious effects on a person's well-being (Aranda & Lincoln, 2011), and is considered a secondary stressor that exacerbates stress for people with disabilities and their subjective health and well-being. Financial strain also captures a subjective assessment of the adequacy of one's income (Angel et al., 2003), and is an enduring problem.

The negative effects of financial strain on health, psychological well-being, and quality of life have been widely recognized in the gerontological literature (Angel et al., 2003; Aranda & Lincoln, 2011; Chiriboga et al., 2002; Ell et al. 2007; Li et al., 2007; Lincoln, 2008). Given that people who acquire a disability may have reduced economic security, empirical studies determined that those with less financial and social resources are particularly vulnerable to experiencing adverse health consequences, though the evidence is primarily limited to

adolescents and young adults with disabilities (Emerson et al., 2009; Honey et al., 2011; Kavanagh et al., 2016; Mandemakers and Monden, 2010; Smith et al., 2005). The adverse repercussions of disability, combined with poor social and living situations, perpetuated negative health and life outcomes (Wolbring, 2011)**.** Based on these findings, it is necessary to examine whether financial strain proliferates the stress between disabilities and subjective health and well-being for people with LTSS needs.

Acute Stressor: COVID-19 Pandemic-related Stress. An acute stressor refers to a life event as a stressor, which may ultimately develop into chronic strains that can be distressing (Avison & Turner, 1988). Large-scale traumatic events (e.g., economic recessions) have been known to increase psychological disorders (Ettman et al., 2020; Frasquilho et al., 2015; Haw et al., 2015; Mucci et al., 2016). Based on a critical review from Hulbert-Williams and Hastings (2008), stressful life events were associated with psychological problems, especially for people with intellectual disabilities. In this study, acute stressor refers to exposure to the COVID-19 pandemic risk resulting from the stay-at-home order and social distancing practices, the most visible public health response to the COVID-19 pandemic. Negative effects of the COVID-19 quarantine on mental health have been documented (Mazza et al., 2020; Neece et al., 2020). Increases in depression and generalized anxiety disorder were found related to the stay-at-home order and personal distancing behaviors (Marroquín et al., 2020). According to a recent review, the psychological effects of quarantine in the general population included post-traumatic stress symptoms, confusion, anger, frustration, boredom, financial loss and stigma (Brooks et al. 2020; Neece et al., 2020).

COVID-19 has been a significant stressor in the long-term care sector and has disproportionately affected specific populations, such as older adults and racial/ethnic minorities

(Dawson et al., 2021; Shippee et al., 2020). A scoping review concluded that lockdown-related measures to contain the COVID-19 pandemic could have disproportionally affected people with disabilities with broader impacts on their health and social grounds, such as reduced employment and income exacerbating disparities and psychological consequences of disrupted routines, activities, and support (Jesus et al., 2021). The absence of strong national policies to accommodate the needs of older adults and adults with disabilities significantly disadvantaged many of them during the pandemic (Sabatello et al., 2020). Therefore, it is important to provide evidence about how COVID-19 pandemic-related stress exacerbates the relationship between disability status and subjective health and well-being for people with LTSS.

Social Locations and Context

Previous studies have left no doubt that differences in people's health and well-being correspond to differences in their social locations within systems of inequality (Pearlin et al., 2005; Pearlin & Bierman, 2013). However, people with disabilities have only recently begun to be recognized by the field of public health as a population with significant health disparities (Sabatello et al., 2020). Many stressful experiences can be traced back to surrounding social structures and people's locations within them (Pearlin, 1989). People's social locations encompass various stratification factors that cut across society, such as social and economic class, race and ethnicity, gender, and age (Pearlin, 1989). These characteristics have often been treated as control variables (Rosenberg, 1965; Gignac et al., 2021; Pettinicchio et al., 2021); however, this precludes the direct examination of their potentially important role in the study of stress (Pearlin, 1989). The structural contexts of people's lives are not extraneous, but fundamental to the stress process (Pearlin, 1989). This study assessed individuals' age and

race/ethnicity as two potential disparities, exposing them to varying stressor levels, and impacting their health outcomes. Previous studies focused on looking at older adults who may already get support from various public programs and services and neglected young and middle-aged people with disabilities who may also have a high need for LTSS (Ne'eman et al., 2022). Young and middle-aged people will need LTSS for long periods as they age with disabilities. It is important to know how aging with long-term disability is different from aging into disability in later life (Putnam, 2014). In addition, previous analyses focused on examining health disparities between older white and Black adults (Shippee et al., 2020). Few studies have addressed the LTSS issues for specific racial/ethnic minorities, such as whites, Latinx, Asians, Blacks/African Americans, American Indians and Alaska Natives, and people with two or more races. These groups of people may be financially vulnerable in different aspects (e.g., lack of income, unaffordable housing, insufficient food) and worry about making ends meet. They may need more support from targeted policies and programs. This study will contribute to the literature and inform policies and programs by assessing the influence of social locations on people's financial strain and health and well-being outcomes for people with LTSS needs.

Research Gaps

Based on the theoretical framework and previous studies, this study identified three research gaps that can be filled by: 1) using an overarching measure of financial strain that addresses multiple aspects of daily living for people with LTSS needs; 2) examining combined effects of financial strain and COVID-19 pandemic-related acute stress, which expands Pearlin's Stress Process Model to address chronic and acute stressors simultaneously for people with LTSS needs; 3) exploring people with LTSS needs from different ages and racial/ethnic groups on their

disability status, financial strain, subjective health and well-being, and the associations between them.

Overarching Measure of Financial Strain

While a few studies have examined the association between financial strain and various health and well-being outcomes, most of these studies measured financial strain according to a single construct instead of using a multidimensional measure that accounts for multiple aspects of financial strain (e.g., Angel et al., 2003; Aranda & Lincoln, 2011; Ettman et al., 2020). For example, Lincoln et al. (2003) used the question "How difficult is it for you to pay your monthly bills?" to measure financial strain among participants. Yet Mendes De Leon et al. (1994) found that family or individual income by itself cannot fully characterize the difficulty families or individuals may experience in meeting their financial obligations. Researchers must use other indicators to measure this kind of stress, including behavioral observation and self-reports of the experience of stress and its consequences (Angel et al., 2003). As another example, financial strain was measured using a five-item scale on which participants indicated the degree of difficulty (very difficult, somewhat difficult, not at all difficult) in meeting needs for housing, food, personal expenses, transportation, and medical expenses (Turner & Turner, 2004). Though this measure specifically asked about people's financial needs in different aspects, it is still a single measure that cannot separate the effects of each individual aspect. In a recent study examining financial strain and suicide attempts among U.S. adults, Elbogen et al. (2020) found that a cumulative four-dimensional measure of financial strain—financial debt/crisis, unemployment, past homelessness, and lower-income—was associated with subsequent suicide attempts. Though these four dimensions did not address other aspects of financial strain, such as medical/healthcare, food expenses, and other costs in daily activities, Elbogen et al.'s (2020)

study showed that financial stressors were linked and cumulative. Focusing on only one dimension of stress could be insufficient to mitigate the negative effects of financial strain (Ettman et al., 2020; Moore et al., 2017). Angelelli et al. (2022) conducted a scoping review to examine the effects of social determinants of health interventions on adults living with disabilities, related to food, transportation, and housing. The study demonstrated the importance of using a comprehensive measure addressing multiple financial needs (e.g., housing, food, savings, medical expenses) of people with disabilities, as these needs are too complicated to be measured by an individual aspect.

This study used a comprehensive and cumulative measure of financial strain to examine its stress proliferation effects between disability status and subjective health and well-being for people with LTSS needs. This cumulative measure of financial strain includes multiple factors that may contribute to financial strain, such as housing, medical/healthcare, income, savings, and food expenses. Descriptive analyses examined the prevalence of individual and cumulative financial difficulty for people with LTSS needs in California and these distributions of financial difficulties by age and race/ethnicity. This study also investigated the associations between the individual aspect of financial strain and people's disability status and subjective health and well-being. The cumulative measure, measured by the count of financial difficulties, was used in multivariate analysis to reflect the extent to which the association between disability status and subjective health and well-being may operate through financial strain.

Separate and Combined Effect of Financial Strain and COVID-19 pandemic-related Acute Stress

Previous studies have examined the associations between financial strain and subjective health and well-being for people with LTSS needs (Angel et al., 2003; Aranda & Lincoln, 2011; Brown et al., 2017; Chiriboga et al., 2002; Ell et al., 2007; Li et al., 2007; Lincoln, 2008; Scherer et al., 2019). For example, Angel et al. (2003) found that financial strain was strongly associated with subjective health and well-being, such as cognitive capacity, depression, and self-esteem, rather than objective measures of performance-based mobility and mortality. Aranda and Lincoln (2011) found that financial strain mediated the effects of sociocultural (nativity status, years of U.S. residence) and social status factors (age, education) on depressive symptoms. Financial status has long been established as key outcomes of well-being, with a growing literature examining the association between perceived financial strain and self-rated health (Shippee et al., 2012). However, less is known about how financial strain exacerbates the stress of different disability statuses on individuals' subjective well-being. Therefore, this study is among the first to examine how financial strain mediates the association between disability status and health and well-being.

Recent studies have also investigated the associations between COVID-19 quarantine and financial difficulties and subjective health and well-being for the general population (Marroquín et al., 2020; Mazza et al., 2020; Neece et al., 2020). The global COVID-19 pandemic has not only resulted in widespread medical complications and loss of life, but has also impacted global economies and transformed daily life (Nelson et al., 2020). One consequence is certain during the COVID-19 pandemic: people are experiencing significant financial strain, as well as anxiety and depression (Elbogen et al., 2020). However, less is known about the extent to which the

COVID-19 pandemic has impacted the financial strain and subjective health and well-being of people with LTSS needs.

Moreover, few empirical studies have examined the combined effects of financial strain and COVID-19 pandemic-related stress on people's subjective health and well-being, especially for people with LTSS needs. Brown and Hargrove (2018) found that chronic strains and trauma negatively affected older Black men's self-rated health. Findings from their study illustrate the importance of examining the combined effects of numerous stressors, rather than focusing on the consequences of an individual stressor. Importantly, differences in the predictive power of stressors—when considered individually versus in the context of other stressors—underscore the importance of investigating numerous stressors experienced simultaneously to determine their unique effects on health. (Brown & Hargorve, 2018). Therefore, this study used the innovative method of Conditional Process Analysis to examine the combined effect of financial strain and COVID-19 pandemic-related stress on the association between disability status and subjective health and well-being for people with LTSS needs. Conceptually, one of the further directions of Pearlin's Stress Process Model is to examine the joint effects of multiple stressors (Pearlin & Bierman, 2013). Although little attention has been given to this matter, it is possible that where multiple stressors simultaneously impinge on the lives of people, they might either exacerbate or weaken the mental health consequences of a specific stressor (Pearlin & Bierman, 2013). The empirical findings from this study may also expand Pearlin's Stress Process Model by examining chronic and acute stressors simultaneously.

Examining Specific Groups of People with LTSS Needs

Disability is more damaging to health for certain groups, and stress proliferation is likely not uniformly experienced by all individuals confronting the same difficult life circumstances. It is important to look at the whole group of people with LTSS needs as there may exist disparities by different social locations among the associations between disability status, financial strain, COVID-19 pandemic-related acute stress, and subjective health and well-being. Previous studies examined disparities of age and race/ethnicity among certain associations (e.g., financial strain was found to mediate the association between age and depression for older Latinxs) (Aranda & Lincoln, 2011). However, there is a lack of comprehensive exploration of how these disparities expose individuals to varying stressor levels, which may impact their health outcomes.

Age. Disability is highly related to age. Most previous studies focused either on adolescents and young adults with disabilities (Emerson & Hatton, 2007; Emerson et al., 2012; Honey et al., 2011; Kavanagh et al., 2016) or older adults (Angel et al., 2003; Aranda & Lincoln, 2011; Chiriboga et al., 2002; Ell et al., 2007; Li et al., 2007; Lincoln, 2008;), examining the associations between the disadvantaged circumstances (including financial strain) and subjective health and well-being. Within disability research, studies generally focused on either young adults or older people with intellectual disabilities. The in-between age group (adulthood and middle-age) has rarely been of interest (Lovgren, 2015). Limited quantitative research has simultaneously examined young, middle-aged, and older adults with disabilities who all have vital LTSS needs. People of different ages in need of LTSS may have different perceptions and experiences of financial strain and traumatic events, such as the COVID-19 pandemic, impacting their health and well-being differently. Among patients with the same level of household financial stress, older patients perceived less financial strain from difficulty paying bills than

younger patients (Benoit Francoeur, 2005). Aranda and Lincoln (2011) found that financial strain mediated the association between age and depression, suggesting that older Latinxs experienced more financial strain and had increased depressive symptoms than younger Latinxs. Studies conducted in Australia found that young people (aged 15-29) with disabilities were more likely than their peers to live under conditions that were detrimental to their mental health, including financial hardship (Emerson et al., 2009; Honey et al., 2011). Concerning traumatic (e.g., life-threatening) events, Hatch and Dohrenwend (2007) found that both traumatic and other stressful events were reported more by younger age groups (in samples 18 years of age and older). Therefore, age is an important social location explored in this study.

Race/ethnicity. Racial/ethnic minorities are more likely to have LTSS needs and experienced financial difficulties than their white counterpart. Previous studies found that higher percentages of Black and Hispanic Americans have limitations in ADLs and IADLs than white Americans, and even higher percentages of these lower-income minority groups have limitations (National Center for Health Statistics, 2013; Thach & Wiener, 2018). However, few previous studies have examined race/ethnicity disparities in the financial strain and subjective health and well-being of people with different types of disabilities. Courtney-Long et al. (2017) suggested that disparities experienced by adults with disabilities may be compounded by disparities associated with race and ethnicity.

Older adults receiving publicly funded HCBS experienced significant racial/ethnic disparities in health and well-being. Among non-institutionalized older adults, white older Americans consistently rated their health more positively than Black, Asian, and Latinx older adults, and financial strain was unique mediator for Asian and Latinx older adults regarding their self-rated health (Shippee et al., 2020). Another study found that though racial/ethnic minority older adults

tended to report more exposure to stressors than white older adults, they did not exhibit the expected increase in psychological distress (Brown et al., 2020).

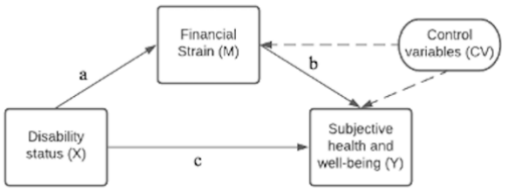
Previous research consistently found that financial strain was common in late life, particularly among older minorities (Aranda, 2006; Aranda & Lincoln, 2011; Chiriboga et al., 2002; Federal Interagency Forum on Aging-Related Statistics, 2004). For example, older Black and Latinx individuals reported more chronic stress exposure than whites and were two to three times as likely to experience financial strain and housing-related stress (Brown et al., 2020). With regard to the acute stress, Hatch and Dohrenwend (2007) found that traumatic and other stressful events tend to be more frequent in racial/ethnic minority groups. Emerging data show that older adults of color and Indigenous older adults have a higher burden of illness and death from COVID-19 than their white peers (Hedgpeth et al., 2020; Scott, 2020; Shippee et al., 2020). All these findings show the complexity of race/ethnicity with regard to financial strain and health and well-being for people with LTSS needs. Therefore, the potential effects of race/ethnicity on the associations between disability status, financial strain, COVID-19 pandemic-related acute stress, and subjective health and well-being were explored in this study.

Hypotheses and Conceptual Frameworks

Using the logic of Pearlin's adapted theoretical framework, the study aims to fill in research gaps by posing four main research questions and testing hypotheses (See Table 1).

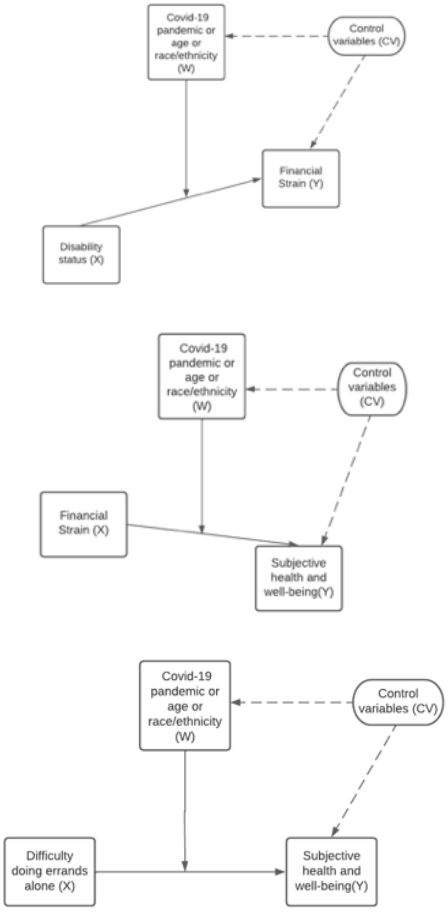
Table 1

Research Questions, Hypotheses, and Conceptual Frameworks

Research question	Hypotheses	Conceptual frameworks
Question 1 *(Mediations)*: To what extent did the effects of people's disability status[1] on their subjective health and well-being[2] operate through financial strain?	<u>Hypotheses 1-1:</u> People who have individual disability difficulty would have higher level of financial strain, that could relate to worse subjective health and well-being. - Hypotheses 1-1-1: People who have having difficulty concentrating, remembering, and making decisions (cognitive impairment) would have higher level of financial strain, that could relate to worse subjective health and well-being. - Hypotheses 1-1-2: People who have having difficulty dressing and bathing (ADLs) would have higher level of financial strain, that could relate to worse subjective health and well-being. - Hypotheses 1-1-3: People who have having difficulty doing errands alone (IADLs) would have higher level of financial strain, that could relate to	 Conceptual framework 1: Financial strain mediates the association between disability status and subjective health and well-being

[1] All models test individual disability difficulty and multiple disability status. Individual disability difficulty includes (1) having difficulty concentrating, remembering, and making decisions (cognitive impairment); (2) having difficulty dressing and bathing (ADLs); (3) having difficulty doing errands alone (IADLs). Multiple disability status refers to the number of disability difficulties that people have.

[2] All models test two types of subjective health and well-being, including (1) self-rated health; and (2) serious psychological distress.

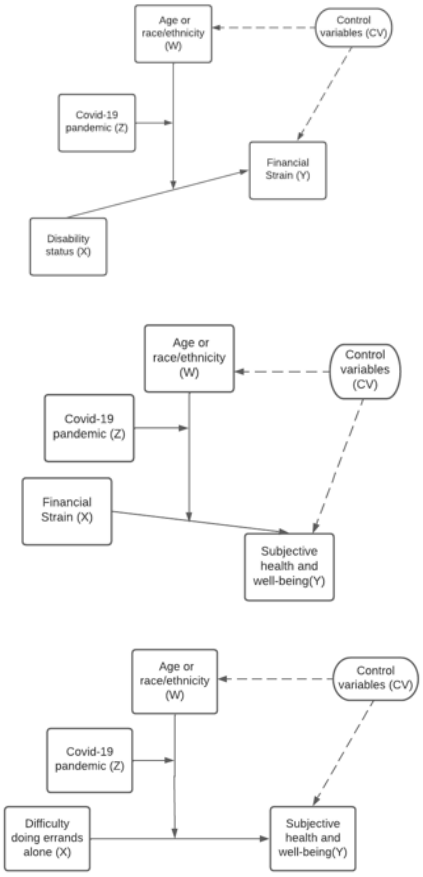
	worse subjective health and well-being. Hypotheses 1-2: People who have more disability difficulties would have a higher level of financial strain, which could relate to worse subjective health and well-being.	
Question 2 *(Moderations)*: 2-1: How did the direct associations between people's disability status, financial strain, and subjective health and well-being change before and during the COVID-19 pandemic? 2-2: How did the direct associations between their disability status, financial strain, and subjective health and well-being differ by age and race/ethnicity?	Hypotheses 2-1: The direct association between 1) disability status and level of financial strain; 2) level of financial strain and subjective health and well-being; and 3) disability status and subjective health and well-being would be stronger during the COVID-19 pandemic than before. Hypotheses 2-2-1: The three direct associations mentioned in 2-1 would be stronger for young and middle-aged adults with LTSS needs than those who are older adults. Hypotheses 2-2-2: The three direct associations mentioned in 2-1 would be stronger for racial/ethnic minorities with LTSS needs than their white counterparts.	 Conceptual framework 2: Moderation associations between disability status, financial strain, and subjective health and well-being by 1) the COVID-19 pandemic; 2) age; or 3) race/ethnicity

Question 3 (Moderated moderations): 3-1: How did the direct associations between people's disability status, financial strain, and subjective health and well-being differ by the interaction between the COVID-19 pandemic and age?

3-2: How did the direct associations between people's disability status, financial strain, and subjective health and well-being differ by the interaction between the COVID-19 pandemic and race/ethnicity?

<u>Hypotheses 3-1:</u> The direct association mentioned in 2-1 would be stronger during the COVID-19 pandemic than before for young and middle-aged adults with LTSS needs than those who are older adults.

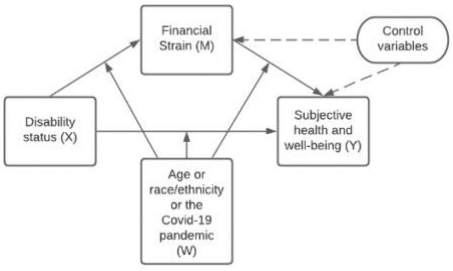
<u>Hypotheses 3-2:</u> The direct association mentioned in 2-1 would be stronger during the COVID-19 pandemic than before for racial/ethnic minorities with LTSS needs than their white counterparts.



Conceptual framework 3: Moderated moderation association between disability status, financial strain, and subjective health and well-being by the interaction 1) between the COVID-19 pandemic and age; and 2) between the COVID-19 pandemic and race/ethnicity

Question 4 (Moderated mediations): 4-1: How did the COVID-19 pandemic change the effects of people's

<u>Hypotheses 4-1:</u> The indirect association between disability status and subjective health and well-being through level of financial strain would be stronger during the COVID-19 pandemic than before.



Conceptual framework 4: The mediation association between disability status, financial strain and subjective health and well-being is

disability status on their subjective health and well-being through financial strain? 4-2: How did people's age or race/ethnicity differentiate the effects of people's disability status on their subjective health and well-being through financial strain?	<u>Hypotheses 4-2-1:</u> The indirect association mentioned in 4-1 would be stronger for young and middle-aged adults with LTSS needs than those who are older adults. <u>Hypotheses 4-2-2:</u> The indirect association mentioned in 4-1 would be stronger during the COVID-19 pandemic than before for racial/ethnic minorities with LTSS needs than their white counterparts.	moderated by 1) the COVID-19 pandemic; 2) age; or 3) race/ethnicity

Research Methods

Dataset

This study used data from the California Long-Term Services and Supports (CA-LTSS) survey merged with data from the California Health Interview Survey (CHIS). The general CHIS survey is the largest state health survey in the U.S. and a critical source of data that is representative of many of the state's various racial and ethnic groups across all ages in California. Beginning in 2019, CHIS transited from using random-digit-dialing (RDD) computer-assisted telephone interviews (CATI), with the addition of cell phone RDD, to a mixed-mode survey (web and telephone) using a random sample of California addresses (UCLA Center for Health Policy Research, 2021).

CHIS general survey participants who responded affirmatively to any of the following three screening questions were eligible to participate in the CA-LTSS study: 1) Because of a physical,

mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions? 2) Do you have difficulty dressing or bathing? 3) Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone, such as visiting a doctor's office or shopping? Therefore, the CA-LTSS study participants included a sample of adult CHIS participants (i.e., ages 18 and over) who had either cognitive or functional impairments with LTSS needs. The CA-LTSS dataset is the most comprehensive population-level dataset to examine disparities in access to care, services, supports, unmet needs, and uses of LTSS in California.

The CA-LTSS survey completed the collection of the first cycle of the dataset, including two years[3] of data from individuals with LTSS needs in California. The first year of data was collected from Feb 2020 to April 2020 (N = 1,098). The second year of LTSS data was collected from April 2020 to January 2021 (N = 933). More than half of the data was collected before the first stay-at-home order in California (Mar 19th, 2020), which made it suitable for pre- and during the COVID-19 pandemic comparison analysis. The total sample includes 2031 participants (N = 2,031) in need of LTSS in California. The confidential datasets of CHIS and CA-LTSS were accessed through the UCLA Center for Health Policy Research Data Access Center. The study was approved as an exempt from the Institutional Review Boards review by UCLA.

[3] The year refers to the CHIS survey cycle year.

Measures

Subjective Health and Well-being

This study used two CHIS variables to measure the subjective health and well-being of people with LTSS needs: self-rated health and serious psychological distress.

Self-rated Health. Participants were asked to describe their health as excellent, very good, good, fair, or poor. Self-rated health levels were numerically coded such that increasing values indicate better health (0 = poor; 1 = fair; 2 = good; 3 = very good; 4 = excellent).

Serious Psychological Distress. Serious psychological distress was assessed using the Kessler 6 (K6) Scale (Sorkin et al., 2009). The questionnaire asked participants how they have been feeling during the past 30 days with respect to the following six items 1) nervous; 2) hopeless; 3) restless or fidgety; 4) so depressed that nothing could cheer you up; 5) that everything was an effort; 6) worthless. Each item was coded as: 0 = None/Never; 1 = A little; 2 = Some; 3 = Most; 4 = All. The resulting range for serious psychological distress is 0–24. According to the scoring criterion established by Kessler with excellent internal consistency reliability (Cronbach's alpha = 0.89), a score of 6 or greater indicates mental distress, and 13 or greater is used to establish the status of being diagnosed with serious mental illness (Kessler et al., 2002; Sorkin et al., 2009).

Disability Status

Disability status was measured by assessing the individual and combination of difficulty items people report in the CA-LTSS survey. The questions about these difficulties were the same as the screening questions in CHIS used to identify eligible LTSS participants. The measures of individual disability difficulty include: 1) difficulty concentrating, remembering, or making

decisions, also known as cognitive impairment ("Yes = 1" or "No =0"); 2) difficulty dressing and bathing, also known as difficulty in ADLs ("Yes = 1" or "No =0"); 3) difficulty doing errands alone, also known as difficulty in IADLs ("Yes = 1" or "No =0"). The disability index measures the count of these three types of difficulties that people have, ranging from 0-3.

Financial Strain

Financial strain was measured by assessing the individual and combination of items in financial difficulties people report in the CA-LTSS survey. The survey asks: "Have you experienced any of the following financial challenges in the last 12 months?". All participants answered "Yes = 1" or "No =0" to the following seven conditions: 1) You were unable to make your rent or mortgage payment; 2) You had debt due to medical bills; 3) You had to cut back on saving for retirement; 4) You had to cut down on the amount you spend on food; 5) You received or borrowed money from someone because you were struggling to get by; 6) Your household income declined; 7) You had to cut down on the amount you spend on prescription medications or medical care. This study created a composite variable of financial strain to count the cumulative number of financial difficulties for analysis, ranging from 0-7. The source of these financial strain questions came from a statewide poll from the SCAN Foundation in 2012. Individual financial difficulty item was examined in the descriptive analyses of this study, and cumulative financial strain measure was used in the Conditional Process Analyses.

COVID-19 Pandemic-related Acute Stress

A variable was created in the LTSS survey based on whether the survey was conducted before or after California's first stay-at-home order (March 19th, 2020). The variable was coded

"1" if the survey was conducted after the order and "0" if it was before. This measure approximates the potential for pandemic-related acute stress by the time the data were collected.

Social Location Variables

Social location variables include age, race/ethnicity, gender, family status, education, employment, and poverty, all collected by the CHIS general survey. This study focused on examining potential age and race/ethnicity disparities in the hypothesized associations between disability status, financial strain, and subjective health and well-being for older adults and adults with disabilities. Other social location variables were treated as control variables for all multivariate analyses. Age was categorized into three groups: 18-44 (young adults), 45-64 (middle-aged adults), and 65 and above (older adults). The race/ethnicity variable had five categories: White (non-Latinx), Latinx, Black/African American (non-Latinx), Asian (non-Latinx), and others[4]. Gender was measured as a binary with two categories of male and female. Family status was categorized as a four-level categorical variable, including single without kids, married without kids, married with kids, and single with kids. The education variable had three categories: less than high school, high school, and above high school. The employment variable was reclassified into three categories: employed, unemployed (looking for work), and unemployed (not looking for work). Poverty levels had four categories and was considered as a categorical variable: 0-99% federal poverty level (FPL), 100-199% FPL, 200-299% FPL, and 300% FPL and above.

[4] The California Health Interview Survey (CHIS) contains rich and detailed racial and ethnic information about California's diverse population. This study uses race/ethnicity variable based on OMB (the Office of Management and Budget). The category of others includes American Indian/Alaska Native Only (Non-Latinx), two or more races, and others.

Data Analytic Methods

The data analyses included descriptive analyses and conditional process analyses (CPA). Descriptive analyses included univariate and bivariate analyses (both unadjusted and adjusted analyses). The results of the descriptive analyses were weighted based on population characteristics in California. Therefore, this study's descriptive results can represent disability status, financial strain, subjective health and well-being for people with LTSS needs at the population level in California. The Conditional Process Analyses (CPA) focused on answering the research questions and testing hypotheses shown in Table 1.

Descriptive Analyses

First, this study conducted univariate analyses for all social locations and the COVID-19 pandemic variables. Second, this study showed distributions of main constructs related to disability status, financial strain, and subjective health and well-being. All these distributions were also examined by age and race/ethnicity by using chi-square tests and one-predictor Ordinary Least Squares depending on the type of main construct variables. Third, bivariate analyses were conducted by using chi-square tests to examine the associations between individual disability difficulty and individual financial difficulty. Fourth, unadjusted and adjusted tests[5] were conducted by 1) using Poisson Regressions to examine the associations between disability status and financial strain; 2) using Ordinal Logistic Regressions to examine the associations between disability status and self-related health; 3) using Ordinal Least Squares to examine the associations between disability status and serious psychological distress; 4) using Ordinal Logistic Regressions to examine the associations between individual financial difficulty

[5] Adjusting covariates

or financial strain and self-related health; 5) using Ordinal Least Squares to examine the associations between individual financial difficulty or financial strain and serious psychological distress. All descriptive analyses were conducted in Stata 16, using the SVY command with survey weights developed for the CA-LTSS survey to produce population-representative estimates.

Conditional Process Analyses (CPA)

The Conditional Process Analysis (CPA) is an analytical strategy that integrates mediation and moderation analysis to test hypotheses about how mechanisms vary due to context or individual differences (Hayes & Rockwood, 2020). CPA aims to discern the conditional nature of the mechanism(s) by which one variable is conceived to relate to another and test the contingent effects (Hayes, 2017). The contingencies of mechanisms – under what conditions and the through which process -- provide a more holistic understanding of a phenomenon because it is insufficient to examine only one or the other (Hayes, 2017). Hayes (2017) primarily used data from simple experimental or cross-sectional studies to examine the CPA. Consequently, this study applied the CPA in the cross-sectional CA-LTSS dataset. This study used the PROCESS macro, a computation procedure for SPSS developed by Hayes to implement CPA and test the analytical models. These models include one set of the mediation model (PROCESS - Model 4) to answer Research Question One, three sets of the moderation model (PROCESS - Model 1) to answer Research Question Two, three sets of the moderated moderation model (PROCESS - Model 3) to answer Research Question Three, and three sets of the moderated mediation model (PROCESS - Model 59) to answer Research Question Four. Using the PROCESS macro, this study employed a nonparametric bootstrapping procedure to calculate a confidence interval (CI)

to test the unconditional and conditional indirect effects. The bootstrap estimates reported were based on 10,000 bootstrap samples. Given moderators were either dichotomous or categorical in the study, pick-a-point approach was used to probe interactions.

Sample Characteristics

Table 2 shows descriptive statistics of demographics (i.e., social locations) and the COVID-19 pandemic constructs. Close to half of the study participants (46.7%) were older adults 65 years and above, 24.0% were young adults between 18 to 44 years old, and 29.3% were middle-aged adults between 45 to 64 years old. Almost half of the participants (49.6%) were white (non-Latinx), 28.7% were Latinx, 8.2% were Black/African American only (non-Latinx), 9.5% were Asian (non-Latinx), and 4.0% were others. More than half of the participants were female (55.7%), and 44.3% were male. Regarding family status, more than half of the participants were single with no kids (56.1%), 30.1% were married with no kids, 6.7% were married with kids, and 7.1% were single with kids. Around half of the participants had above high school education (49.0%), 37.5% had high school education, and 13.5% had less than high school education. For employment status, 24.6% of participants were employed when receiving the survey, 67.8% were unemployed and not looking for work, and 7.6% were unemployed but looking for work. The distribution of participants' poverty levels was as follows: 21.0% lived between 0-99% federal poverty level (FPL); 23.9% lived between 100-199% FPL; 16.6% lived between 200-299% FPL; and 38.5% lived 300% FPL and above. 47.7% of participants received the CA-LTSS survey after California's "Stay-at-home" order.

Table 2

Descriptive Statistics of Social Locations and the COVID-19 Pandemic Variables

	Variables	Percentage
Age	18-44	24.0
	45-64	29.3
	65 and above	46.7
Race/Ethnicity	White (NL)	49.6
(NL: none Latinx)	Latinx	28.7
	Black/African American only (NL)	8.2
	Asian (NL)	9.5
	Others	4.0
Gender	Male	44.3
	Female	55.7
Family status	Single with no kids	56.1
	Married with no kids	30.1
	Married with kids	6.7
	Single with kids	7.1
Education	Less than high school	13.5
	High school	37.5
	Above high school	49.0
Employment	Employed	24.6
	Unemployed, looking for work	7.6
	Unemployed, not looking for work	67.8
Poverty level	0-99% FPL	21.0
	100-199% FPL	23.9
	200-299% FPL	16.6
	300% FPL and above	38.5
Data collected after California “Stay-at-home” order		47.7

Results

Descriptive Results

Distributions of Main Constructs by Age and Race/Ethnicity

Table 3 shows descriptive statistics of main constructs (i.e., disability status, financial strain, and subjective health and well-being) for the full sample and by age and race/ethnicity. 54.6% of participants reported having cognitive impairment. This difficulty was reported more among young (67.8%), Black/African American (66.3%), and Asian (66.3%) participants than among other age ($p = 0.000$) and racial/ethnic groups ($p = 0.006$). 35.9% of the participants reported having difficulty dressing or bathing (ADLs). This difficulty was reported more among older adults (46.3%) and the Black/African American (47.7%) groups than among other age ($p = 0.000$) and racial/ethnic groups ($p = 0.006$). More than half (52.7%) of the participants reported having difficulty doing errands alone (IADLs). This difficulty was reported more among older adults (63.3%) than among young and middle-aged participants ($p = 0.000$). The average number of disability difficulties was around 1.4 for all participants, and older adults had a higher number (1.6) than other age groups ($p = 0.016$).

Regarding individual financial difficulty, more than 40% of the participants reported having to cut back on saving for retirement (40.2%) and cut down the amount spent on food (40.4%). More than one-third of the participants reported having household income decline (38.5%) and nearly one-third reported receiving/borrowing money from someone (31.9%). Close to one in five participants had debt due to medical bills (20.1%), cut down on the amount spent on prescriptions or medical care (18.8%), or were unable to make rent or mortgage payments (17.7%). Middle-aged participants had a higher chance of experiencing most types of financial difficulties than young and old age participants, including being unable to make rent or mortgage

payments (p = 0.002), having debt due to medical bills (p = 0.001), cutting back on saving for retirement (p = 0.000), cutting down the amount spent on food (p = 0.000), and having household income declined (p = 0.000). One financial difficulty – receiving or borrowing money from someone – was more frequently reported among the young participants than among the middle-aged and older participants (p = 0.000). Latinx (25.8%) and Asian (21.1%) participants were more likely to be unable to make rent or mortgage payments compared to other racial/ethnic groups (p = 0.012). More than half of Black/African American participants (56.7%) reported cutting down the amount spent on food, a higher proportion than other racial/ethnic groups (p = 0.029). Latinx (43.0%) and Black/African American (44.5%) participants were more likely to report receiving or borrowing money from someone than other racial/ethnic groups (p = 0.000). On average, participants experienced 2.1 types of financial difficulty. The number was higher for middle-aged (2.8) and young (2.2) participants than for older (1.5) participants (p = 0.000).

For subjective health and well-being, the average value of self-rated health for all participants was 1.6, the level between fair to good. Middle-aged (1.4) and older (1.5) participants reported lower levels of self-rated health than the young participants (2.0) (p = 0.000). No significant differences were found between racial/ethnic groups regarding self-rated health. The average value of the serious psychological distress score for all participants was 7.6, indicating mental distress. This score was higher for young adults (10.9) and Asian (10.4) participants than for other age and racial/ethnic participants (p = 0.000).

Table 3

Descriptive Statistics of Main Constructs for (A) Full Sample; (B) By Age; (C) By Race/ethnicity

		Percentage/Mean (SD)									
		(A)	(B) By age				(C) By race/ethnicity					
Constructs	Variables	Full sample	1	4	65 and above	*p*	White, non-Latinx (NL)	Latinx	Black/African American only (NL)	Asian (NL)	Others	*p*
Disability status	Have serious difficulty concentrating, remembering, or making decisions (cognitive impairment)	54.6	67.8	57.6	45.9	0.000***	46.9	60.8	66.3	66.3	53.1	0.006**
	Have difficulty dressing or bathing (ADLs)	35.9	15.2	36.3	46.3	0.000***	38.9	33.1	47.7	18.5	35.9	0.026*
	Have difficulty doing errands alone (IADLs)	52	39.3	46.9	63.3	0.000***	54.4	52	59.4	38.4	52.7	0.207
	Disability index: count of disability status (range: 0-3)	1.4 (0.04)	1.2	1.4	1.6	0.016**	1.4	1.5	1.7	1.2	1.5	0.248
Financial Strain	Unable to make rent or mortgage payment	17.7	18.7	25.5	12.3	0.002**	12.9	25.8	14.2	21.1	17.6	0.012*
	Had debt due to medical bills	20.1	15.8	29.1	16.6	0.001***	21.6	17.9	19.3	18.1	23.3	0.830
	Cut back on saving for retirement	40.2	36.4	62.6	28.2	0.000***	37.3	44.6	44.5	38.1	40.6	0.580
	Cut down amount spent on food	40.4	45.1	54.1	29.4	0.000***	34.4	44.1	56.7	42.6	49.6	0.029*
	Received/borrowed money from someone	31.9	44.2	38.5	21.4	0.000***	22.5	43	44.5	35.9	34.2	0.000***
	Household income declined	38.5	42.6	51.2	28.4	0.000***	37	41.3	31.6	43.9	38.4	0.644
	Cut down amount spent on prescriptions or medical care	18.8	20.5	22.7	15.5	0.113	16.9	19.8	23.8	23.2	15.3	0.593
	Financial strain: count of financial difficulties (range: 0-7)	2.1 (0.08)	2.2	2.8	1.5	0.000***	1.8	2.4	2.3	2.2	2.2	0.176
Subjective health and well-being	Self-rated health (range: 0-4)	1.6 (0.04)	2	1.4	1.5	0.000***	1.5	1.7	1.6	1.9	1.6	0.106
	Serious psychological distress (K6 score) (range: 0-24)	7.6 (0.23)	10.9	8.4	5.4	0.000***	7	8	6.4	10.4	7.9	0.001**

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Bivariate Associations between Disability Status, Financial Strain, and Subjective Health and Well-being

Table 4 shows the results of chi-square tests between individual disability difficulty and individual financial difficulty. Participants who had cognitive impairment were significantly more likely to report being unable to make rent or mortgage payment (21.2%), cutting back on saving for retirement (44.6%), cutting down the amount spent on food (45.2%), and receiving or borrowing money from someone (38.9%), than people who do not have this disability difficulty. No significant associations were found between having difficulty dressing or bathing (ADLs) or doing errands alone (IADLs) and individual financial difficulty.

Table 4

Chi-square Tests Between Individual Disability Difficulty and Financial Difficulty

		Have serious difficulty concentrating, remembering, or making decisions (cognitive impairment)			Have difficulty dressing or bathing (ADLs)			Have difficulty doing errands alone (IADLs)		
		Yes	No	*p*	Yes	No	*p*	Yes	No	*p*
Unable to make rent or mortgage payment	%	21.2	13.5	0.017*	16.6	18.3	0.612	16.2	19.3	0.343
Had debt due to medical bills	%	22.7	16.9	0.064	24	17.9	0.063	21.7	18.3	0.294
Cut back on saving for retirement	%	44.6	34.9	0.016*	40	40.3	0.925	38.6	42	0.401
Cut down amount spent on food	%	45.2	34.6	0.009*	39.7	40.8	0.792	39.5	41.4	0.638
Received/borrowed money from someone	%	38.9	23.5	0.000**	33.3	31.1	0.595	33.5	30.1	0.374
Household income declined	%	41.8	34.5	0.073	36.1	39.8	0.378	36.4	40.8	0.274
Cut down amount spent on prescriptions or medical care	%	21.3	15.9	0.082	21.5	17.4	0.214	20.7	16.7	0.197

* $p<0.05$; ** $p<0.01$

Table 5 shows the unadjusted and adjusted associations between disability status (both individual and combination of difficulties) and (A) financial strain; (B) subjective health and well-being. The Poisson analyses showed that people with cognitive impairment were significantly more likely to report having more types of financial difficulties, no matter whether controlling for covariates (IRR = 1.2, p <0.01) or not (IRR = 1.4, p < 0.01). People with more types of disabilities were significantly more likely to report having more financial difficulties, controlling for covariates (IRR = 1.1, p <0.01).

Ordinal Logistic Regression analyses showed that people with difficulty dressing or bathing (ADLs) significantly reported lower odds of endorsing health, no matter whether controlling for

covariates (OR = 0.4, p <0.01) or not (OR = 0.3, p <0.01). Like this finding, people with difficulty doing errands alone (IADLs) significantly reported lower odds of endorsing health, no matter whether controlling for covariates (OR = 0.7, p <0.05) or not (OR = 0.5, p <0.01). People with more types of disabilities significantly reported lower odds of endorsing health, no matter whether controlling for covariates (OR = 0.7, p <0.01) or not (OR = 0.7, p <0.01).

Ordinary Least Squares Regression results showed that people with cognitive impairment were significantly more likely to have more serious psychological distress, no matter whether controlling for covariates (β = 2.7, p < 0.01) or not (β = 3.7, p < 0.01). People with more types of disabilities were significantly more likely to have more serious psychological distress, controlling for covariates (β = 1.0, p < 0.01).

Regarding control variables (results not shown in the table), age, employment, and poverty levels were found to be statistically significant for the Poisson regression between disability status and financial strain: Middle-aged participants were more likely to have more types of financial difficulties (IRRs = 1.4, p <0.01). Unemployed participants (not looking for work) (IRRs = 0.7, p <0.01) and participants with FPL above 300% (IRRs = 0.6, p <0.01) were significantly less likely to have more types of financial difficulties. For the Ordinal Logistic Regressions between disability status and self-rated health, middle-aged participants (ORs = 0.5, p <0.01) and unemployed participants (not looking for work) (ORs = 0.4, p <0.01) significantly reported lower odds of endorsing health. Participants with FPL above 300% (ORs = 1.7, p <0.05) significantly reported higher odds of endorsing health. For Ordinary Least Squares Regression models between disability status and serious psychological distress (K6 score), middle-aged participants were significantly less likely to have more serious psychological distress (βs ≈ -3.3, p < 0.01) compared with young participants. Similarly, older participants were significantly less

likely to have more serious psychological distress (βs ≈ -6.5, $p < 0.01$) compared with young participants.

Table 5

Unadjusted and Adjusted Associations Between Disability Status and (A) Financial Strain; (B) Subjective Health and Well-being

Disability status	(A) Financial strain		(B) Subjective health and well-being			
			Self-rated Health		Serious psychological distress (K6 score)	
	Unadjusted	Adjusted[1]	Unadjusted	Adjusted[1]	Unadjusted	Adjusted[1]
	IRR	IRR	OR	OR	ß	ß
Individual disability difficulty						
Have serious difficulty concentrating, remembering, or making decisions (cognitive impairment)	1.4**	1.2**	1.0	0.9	3.7**	2.7**
Has difficulty dressing or bathing (ADLs)	1.0	1.1	0.3**	0.4**	-1.2*	0.6
Has difficulty doing errands alone (IADLs)	1.0	1.1	0.5**	0.7*	-0.8	0.7
Disability index: count of disability status	1.1	1.1**	0.7**	0.7**	0.5	1.0**

* p<0.05; ** p<0.01

[1] Each model controls for age, race/ethnicity, gender, family status, education, employment, poverty level, time of data collection

Table 6 shows the unadjusted and adjusted associations between financial strain (individual and combination of difficulties) and subjective health and well-being. Ordinal Logistic Regression analyses showed that participants who had specific types of financial difficulties significantly reported lower odds of endorsing health: For example, people who were unable to make rent or mortgage payments significantly reported lower odds of endorsing health, no matter whether controlling for covariates (OR = 0.6, p <0.01) or not (OR = 0.6, p <0.05). People who cut down the amount spent on food significantly reported lower odds of endorsing health, no

matter whether controlling for covariates (OR = 0.7, p <0.05) or not (OR = 0.7, p <0.05). People who cut down the amount spent on prescriptions or medical care significantly reported lower odds of endorsing health, no matter whether controlling for covariates (OR = 0.6, p <0.05) or not (OR = 0.7, p <0.05). People with more types of financial difficulties significantly reported lower odds of endorsing health, no matter whether controlling for covariates (OR = 0.9, p <0.05) or not (OR = 0.9, p <0.05).

Ordinary Least Squares Regression results showed that participants with any individual financial difficulty were significantly more likely to have more serious psychological distress, no matter whether controlling for covariates. For example, the difference in K6 score between participants who were unable to make rent or mortgage payments and those who could was 2.6 (p < 0.01), controlling for covariates. The difference in K6 score between participants who had debt due to medical bills and those who did not was 1.4 (p < 0.01), controlling for covariates. The difference in K6 score between participants who cut back on saving for retirement and those who did not was 1.3 (p < 0.01), controlling for covariates. The difference in K6 score between participants who cut down the amount spent on food and those who did not was 2.4 (p < 0.01), controlling for covariates. The difference in K6 score between participants who received or borrowed money from someone and those who did not was 3.1 (p < 0.01), controlling for covariates. The difference in K6 score between participants who had household income decline and those who did not was 1.1 (p < 0.05), controlling for covariates. The difference in K6 score between participants who cut down the amount spent on prescriptions or medical care and those who did not was 2.0 (p < 0.01), controlling for covariates. For participants with one more type of financial difficulty, their K6 score significantly increased by 0.7 points (p < 0.01), controlling for covariates.

Regarding control variables (results not shown in the table), age, employment, and poverty levels were found to be statistically significant for the ordinal logistic regression between financial strain and self-rated health. Middle-aged participants (ORs = 0.5, p <0.01) and participants who were unemployed (not looking for work) (ORs = 0.4, p <0.01) significantly reported lower odds of endorsing health. People with FPL above 300% (ORs = 1.6, p <0.05) significantly reported higher odds of endorsing health. For ordinary least squares regression models between financial strain and serious psychological distress (K6 score), middle-aged participants were significantly less likely to have more serious psychological distress (βs ≈ -3.5, p < 0.01) compared with young participants. Similarly, older participants were significantly less likely to have more serious psychological distress (βs ≈ -6.6, p < 0.01) compared with young participants.

Table 6

Unadjusted and Adjusted Associations Between Financial Difficulty and (A) Self-rated health; and (B) Serious Psychological Distress

	(A) Self-rated Health		(B) Serious psychological distress	
	Unadjusted OR	Adjusted[1] OR	Unadjusted ß	Adjusted[1] ß
Individual financial difficulties				
Unable to make rent or mortgage payment	0.6*	0.6**	3.4**	2.6**
Had debt due to medical bills	0.7*	0.8	1.7**	1.4**
Cut back on saving for retirement	0.8	0.8	2.1**	1.3**
Cut down amount spent on food	0.7*	0.7*	3.2**	2.4**
Received/borrowed money from someone	0.9	0.8	4.3**	3.1**
Household income declined	1	0.9	2.1**	1.1*
Cut down amount spent on prescriptions or medical care	0.7*	0.6*	2.7**	2.0**
Financial strain: Count of financial difficulty	0.9*	0.9*	1.0**	0.7**

* p<0.05; ** p<0.01

[1] Each model controls for age, race/ethnicity, gender, family status, education, employment, poverty level, time of data collection

Conditional Process Analyses Results

Mediation Analyses Results

Table 7 shows the results when treating financial strain as a mediator of disability status and self-rated health. Regarding individual disability difficulty, having cognitive impairment had a significant indirect association with participants' self-rated health through financial strain (ab = -0.05, 95% CI = [-0.07, -0.03]). Participants who had cognitive impairment tended to have more financial strain (a = 0.73, 95% CI = [0.56, 0.90]) than those who did not have this disability difficulty. More financial strain was related to lower self-rated health (b = -0.07, 95% CI = [-0.09, -0.04]).

Having difficulty dressing and bathing (ADLs) had a significant indirect association with participants' self-rated health through financial strain (ab = -0.03, 95% CI = [-0.04, -0.01]). Participants who had difficulty dressing and bathing (ADLs) tended to have more financial strain (a = 0.46, 95% CI = [0.28, 0.64]) than those who did not have this disability difficulty. More financial strain was related to lower self-rated health (b = -0.06, 95% CI = [-0.08, -0.04]).

Having difficulty doing errands alone (IADLs) had a significant indirect association with participants' self-rated health through financial strain (ab = -0.03, 95% CI = [-0.04, -0.01]). Participants who had difficulty doing errands alone (IADLs) tended to have more financial strain (a = 0.47, 95% CI = [0.30, 0.65]) than those who did not have this disability difficulty. More financial strain was related to lower self-rated health (b = -0.06, 95% CI = [-0.08, -0.04]). Regarding the disability index, participants' number of disability difficulties had a significant indirect association with their self-rated health through financial strain (ab = -0.02, 95% CI = [-0.03, -0.01]). Participants who had more disability difficulties were more likely to experience

financial strain (a = 0.45, 95% CI = [0.36, 0.54]). More financial strain was related to lower self-rated health (b = -0.05, 95% CI = [-0.07, -0.02]).

Table 7

Financial Strain as a Mediator of Disability Status and Self-rated Health

		Coefficient	Confidence Interval
	Predictor: Difficulty concentrating, remembering, and making decisions (cognitive impairment)		
Direct effect			
	Cognitive impairment (X) -> Financial Strain (M)	0.73**	0.56, 0.90
	Cognitive impairment (X) -> Self-rated health (Y)	-0.05	-0.14, 0.04
	Financial Strain (M) -> Self-rated health (Y)	-0.07**	-0.09, -0.04
Indirect effect			
	Cognitive impairment (X) -> Financial Strain (M) -> Self-rated health (Y)	-0.05**	-0.07, -0.03
	Predictor: Difficulty dressing and bathing (ADLs)		
Direct effect			
	Difficulty dressing and bathing (ADLs) (X) -> Financial Strain (M)	0.46**	0.28, 0.64
	Difficulty dressing and bathing (ADLs) (X) -> Self-rated health (Y)	-0.40**	-0.50, -0.31
	Financial Strain (M) -> Self-rated health (Y)	-0.06**	-0.08, -0.04
Indirect effect			
	Difficulty dressing and bathing (ADLs) (X) -> Financial Strain (M) -> Self-rated health (Y)	-0.03**	-0.04, -0.01
	Predictor: Difficulty doing errands alone (IADLs)		
Direct effect			
	Difficulty doing errands alone (IADLs) (X) -> Financial Strain (M)	0.47**	0.30, 0.65
	Difficulty doing errands alone (IADLs) (X) -> Self-rated health (Y)	-0.31**	-0.40, -0.22
	Financial Strain (M) -> Self-rated health (Y)	-0.06**	-0.08, -0.04
Indirect effect			
	Difficulty doing errands alone (IADLs) (X) -> Financial Strain (M) -> Self-rated health (Y)	-0.03**	-0.04, -0.01
	Predictor: Disability index		
Direct effect			
	Disability index (X) -> Financial Strain (M)	0.45**	0.36, 0.54
	Disability index (X) -> Self-rated health (Y)	-0.21**	-0.25, -0.16
	Financial Strain (M) -> Self-rated health (Y)	-0.05**	-0.07, -0.02
Indirect effect			
	Disability index (X) -> Financial Strain (M) -> Self-rated health (Y)	-0.02**	-0.03, -0.01

* p<0.05; ** p<0.01

Note. Each model controls for age, race/ethnicity, gender, family status, education, employment, poverty level, time of data collection

Table 8 shows the results when treating financial strain as a mediator of disability status and serious psychological distress. Regarding individual disability difficulty, having cognitive impairment had a significant indirect association with participants' serious psychological distress through financial strain (ab = 0.48, 95% CI = [0.34, 0.64]). Participants who had cognitive impairment tended to have more financial strain (a = 0.73, 95% CI = [0.56, 0.90]) than those who did not have this disability difficulty. More financial strain was related to more serious

psychological distress (b = 0.67, 95% CI = [0.53, 0.80]). Having difficulty dressing and bathing (ADLs) had a significant indirect association with participants' serious psychological distress through financial strain (ab = 0.37, 95% CI = [0.22, 0.53]). Participants who had difficulty dressing and bathing (ADLs) tended to have more financial strain (a = 0.46, 95% CI = [0.28, 0.64]) than those who did not have this disability difficulty. More financial strain was related to more serious psychological distress (b = 0.80, 95% CI = [0.67, 0.94]). Having difficulty doing errands alone (IADLs) had a significant indirect association with participants' serious psychological distress through financial strain (ab = 0.37, 95% CI = [0.22, 0.53]). Participants who had difficulty doing errands alone (IADLs) tended to have more financial strain (a = 0.47, 95% CI = [0.30, 0.65]) than those who did not have this disability difficulty. More financial strain was related to more serious psychological distress (b = 0.78, 95% CI = [0.65, 0.91]). Regarding the disability index, participants' number of disability difficulties also had a significant indirect association with their serious psychological distress through financial strain (ab = 0.32, 95% CI = [0.23, 0.42]). Participants who had more disability difficulties were more likely to experience financial strain (a = 0.45, 95% CI = [0.36, 0.54]). More financial strain was related to more serious psychological distress (b = 0.32, 95% CI = [0.23, 0.42]).

Table 8

Financial Strain as a Mediator of Disability Status and Serious Psychological Distress

		Coefficient	Confidence Interval
	Predictor: Difficulty concentrating, remembering, and making decisions (cognitive impairment)		
Direct effect			
	Cognitive impairment (X) -> Financial Strain (M)	0.73**	0.56, 0.90
	Cognitive impairment (X) -> Serious psychological distress (Y)	2.89**	2.37, 3.41
	Financial Strain (M) -> Serious psychological distress (Y)	0.67**	0.53, 0.80
Indirect effect			
	Cognitive impairment (X) -> Financial Strain (M) -> Serious psychological distress (Y)	0.48**	0.34, 0.64
	Predictor: Difficulty dressing and bathing (ADLs)		
Direct effect			
	Difficulty dressing and bathing (ADLs) (X) -> Financial Strain (M)	0.46**	0.28, 0.64
	Difficulty dressing and bathing (ADLs) (X) -> Serious psychological distress (Y)	-0.28	-0.83, 0.28
	Financial Strain (M) -> Serious psychological distress (Y)	0.80**	0.67, 0.94

Indirect effect		
Difficulty dressing and bathing (ADLs) (X) -> Financial Strain (M) -> Serious psychological distress (Y)	0.37**	0.22, 0.54
Predictor: Difficulty doing errands alone (IADLs)		
Direct effect		
Difficulty doing errands alone (IADLs) (X) -> Financial Strain (M)	0.47**	0.30, 0.65
Difficulty doing errands alone (IADLs) (X) -> Serious psychological distress (Y)	0.54*	0.01, 1.08
Financial Strain (M) -> Serious psychological distress (Y)	0.78**	0.65, 0.91
Indirect effect		
Difficulty doing errands alone (IADLs) (X) -> Financial Strain (M) -> Serious psychological distress (Y)	0.37**	0.22, 0.53
Predictor: Disability index		
Direct effect		
Disability index (X) -> Financial Strain (M)	0.45**	0.36, 0.54
Disability index (X) -> Serious psychological distress (Y)	0.90**	0.62, 1.18
Financial Strain (M) -> Serious psychological distress (Y)	0.71**	0.57, 0.84
Indirect effect		
Disability index (X) -> Financial Strain (M) -> Serious psychological distress (Y)	0.32**	0.23, 0.42

* $p<0.05$; ** $p<0.01$

Note. Each model controls for age, race/ethnicity, gender, family status, education, employment, poverty level, time of data collection

Moderation Analyses Results

COVID-19 Pandemic-related Acute Stress as a Moderator. No differences were found before and during the COVID-19 pandemic for direct associations between disability status, financial strain, and subjective health and well-being.

Age as a moderator. Age was found to significantly moderate four direct associations: 1) between difficulty doing errands alone (IADLs) and financial strain (see Table 9); 2) between disability index and financial strain (see Table 10); 3) between disability index and serious psychological distress (see Table 11); and 4) between difficulty doing errands alone (IADLs) and serious psychological distress (results will show in the section of moderated moderation).

There was a significant interaction effect between having difficulty doing errands alone (IADLs) and age on financial strain ($F = 4.70$, $p<0.01$) (See Table 9). Simple slope analyses (See Figure 2) showed that the positive association between difficulty doing errands alone and financial strain was less strong for older participants ($\beta = 0.18$, 95% CI = [-0.08, 0.44]) than young participants ($\beta = 0.83$, 95% CI = [0.50, 1.17]), and the difference between these two associations was statistically significant ($\beta = -0.65$, 95% CI = [-1.08, -0.23]). The positive

association between difficulty doing errands alone and financial strain was less strong for middle-aged participants (β = 0.52, 95% CI = [0.22, 0.81]) than young participants (β = 0.83, 95% CI = [0.50, 1.17]), but the difference between these two associations was not statistically significant (β = -0.32, 95% CI = [-0.75, 0.12]).

Table 9

Age as a Moderator Between Difficulty Doing Errands Alone (IADLs) and Financial Strain

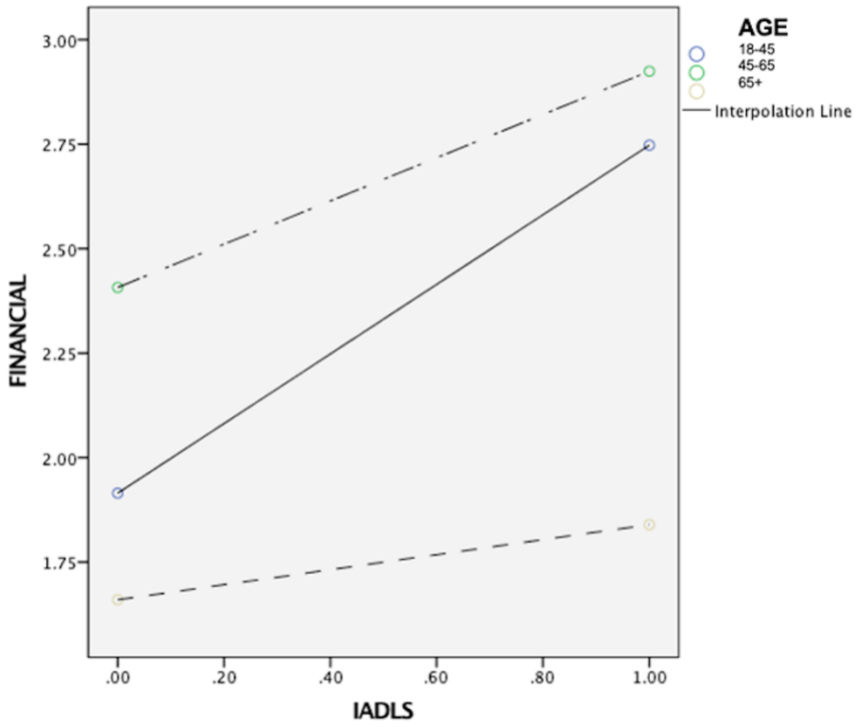
Predictor(s)		Coefficient	Confidence interval
Difficulty doing errands alone (IADLs)		0.83**	0.50, 1.17
Age			
	18-45	Ref	Ref
	W1: 45-65	0.49**	0.20, 0.79
	W2: 65+	-0.25	-0.58, 0.07
IADLs x Age			
Difficulty doing errands alone (IADLs) X W1		-0.32	-0.75, 0.12
Difficulty doing errands alone (IADLs) X W2		-0.65**	-1.08, -0.23
IADLs x Age interaction		$F(12, 2013) = 4.70$, $p<0.01$	
Moderator: Age		Conditional direct effect of X on Y	
		Effect	Confidence interval
18-45		0.83**	0.50, 1.17
45-65		0.52**	0.22, 0.81
65+		0.18	-0.08, 0.44

* $p<0.05$; ** $p<0.01$

Note. This model controls for race/ethnicity, gender, family status, education, employment, poverty level, time of data collection

Figure 2

Association Between Difficulty Doing Errands Alone (IADLs) and Financial Strain by Age Group



There was a significant interaction effect between participants' disability index and age on financial strain ($F = 3.20$, $p<0.05$) (See Table 10). Simple slope analyses (See Figure 2) showed that the positive association between disability index and financial strain was less strong for older participants ($\beta = 0.30$, 95% CI = [0.16, 0.43]) than young participants ($\beta = 0.56$, 95% CI = [0.38, 0.73]), and the difference between these two associations was statistically significant ($\beta = -0.26$, 95% CI = [-0.48, -0.04]). The positive association between disability index and financial strain was less strong for middle-aged participants ($\beta = 0.49$, 95% CI = [0.34, 0.64]) than young participants ($\beta = 0.56$, 95% CI = [0.38, 0.73]), but the difference between these two associations was not statistically significant ($\beta = -0.06$, 95% CI = [-0.29, 0.17]).

Table 10

Age as a moderator between disability index and financial strain

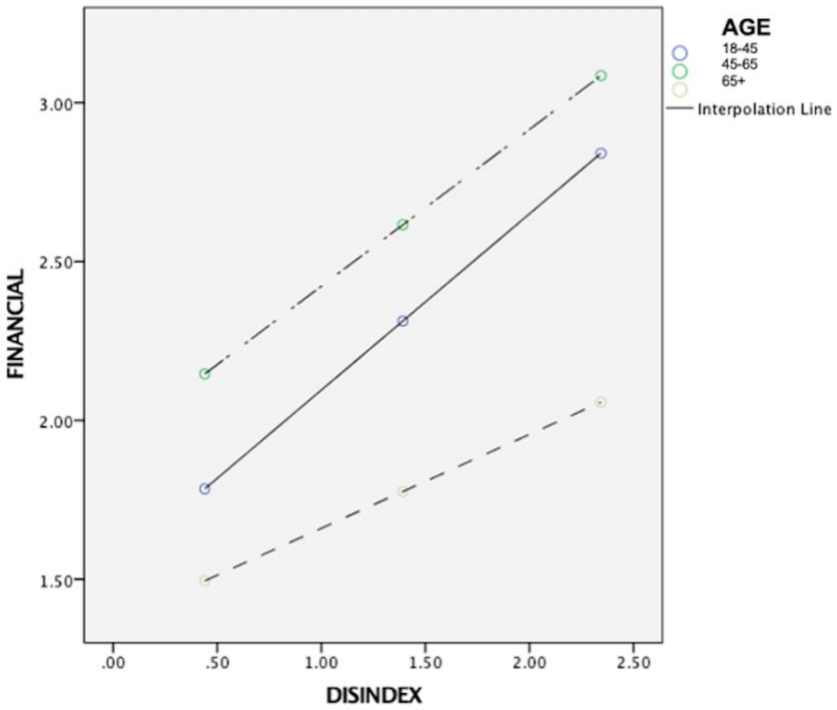
Predictor(s)		Coefficient	Confidence interval
Disability index		0.56**	0.38, 0.73
Age			
	18-45	Ref	Ref
	W1: 45-65	0.39*	0.01, 0.77
	W2: 65+	-0.18	-0.57, 0.22
Disability index x Age			
	Disability index X W1	-0.06	-0.29, 0.17
	Disability index X W2	-0.26*	-0.48, -0.04
	Disability index x Age interaction	$F(12, 2013) = 3.20$, $p<0.05$	
	Moderator: Age	Conditional direct effect of X on Y	
		Effect	Confidence interval
18-45		0.56**	0.38, 0.73
45-65		0.49**	0.34, 0.64
65+		0.30**	0.16, 0.43

* p<0.05; ** p<0.01

Note. This model controls for race/ethnicity, gender, family status, education, employment, poverty level, time of data collection

Figure 3

Association Between Disability Index and Financial Strain by Age Group



There was a significant interaction effect between participants' disability index and age on serious psychological distress (F = 7.74, p<0.001) (See Table 11). Simple slope analyses (See Figure 4) showed that the positive association between disability index and serious psychological distress was less strong for older participants (β = 0.75, 95% CI = [0.33, 1.18]) than young participants (β = 2.15, 95% CI = [1.58, 2.72]), and the difference between these two associations was statistically significant (β = -1.40, 95% CI = [-2.11, -0.69]). The positive association between disability index and serious psychological distress was less strong for middle-aged participants (β = 1.08, 95% CI = [0.61, 1.55]) than young participants (β = 2.15, 95% CI = [1.58, 2.72]), and the difference between these two associations was statistically significant (β = -1.07, 95% CI = [-1.80, -0.35]).

Table 11

Age as a Moderator Between Disability Index and Serious Psychological Distress

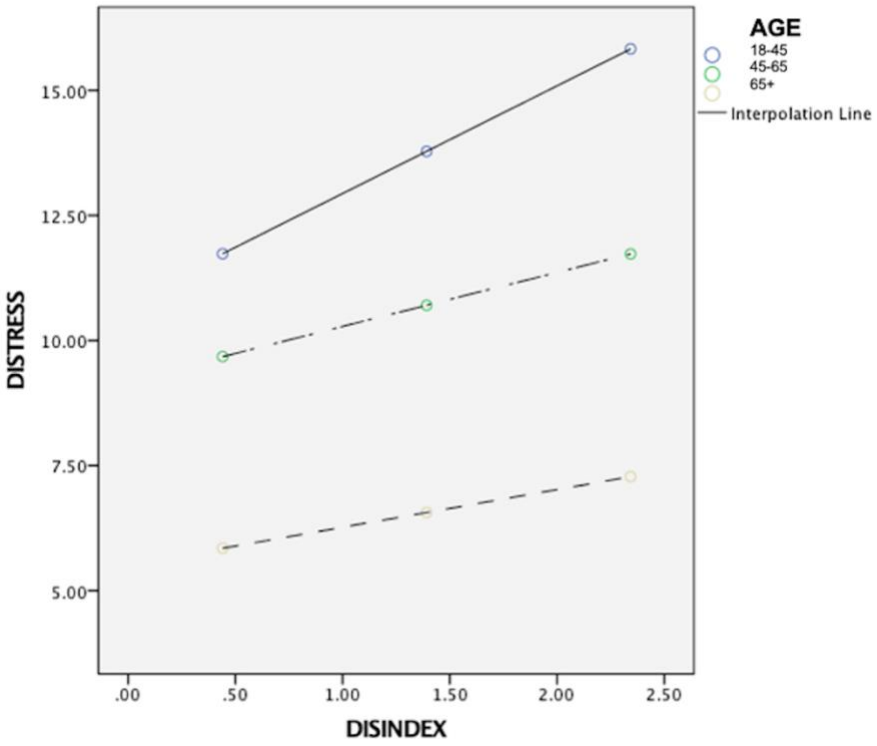
Predictor(s)		Coefficient	Confidence interval
Disability index		2.15**	1.58, 2.72
Age			
	18-45	Ref	Ref
	W1: 45-65	-1.58**	-2.78, -0.39
	W2: 65+	-5.27**	-6.51, -4.03
Disability index x Age			
	Disability index X W1	-1.07**	-1.80, -0.35
	Disability index X W2	-1.40**	-2.11, -0.69
	Disability index x Age interaction	$F(12, 2013) = 7.74$, $p<0.001$	
	Moderator: Age	Conditional direct effect of X on Y	
		Effect	Confidence interval
18-45		2.15**	1.58, 2.72
45-65		1.08**	0.61, 1.55
65+		0.75**	0.33, 1.18

* $p<0.05$; ** $p<0.01$

Note. This model controls for race/ethnicity, gender, family status, education, employment, poverty level, time of data collection

Figure 4

Association Between Disability Index and Serious Psychological Distress by Age Group



Race/ethnicity as a Moderator. Race/ethnicity was found to significantly moderate two direct associations: 1) between having cognitive impairment and financial strain (Table 12); 2) between difficulty doing errands alone (IADLs) and self-rated health (Table 13).

There was a significant interaction between having cognitive impairment and race/ethnicity on financial strain ($F = 3.27$, $p<0.05$) (See Table 12). Simple slope analyses (See Figure 5) showed that the association between having cognitive impairment and financial strain was stronger for others ($\beta = 1.02$, 95% CI = [0.33, 1.70]) and Black/African American participants ($\beta = 0.99$, 95% CI = [0.26, 1.71]) than white ($\beta = 0.79$, 95% CI = [0.58, 0.99]), Latinx ($\beta = 0.57$, 95% CI = [0.16, 0.98]), and Asian participants ($\beta = -0.99$, 95% CI = [-0.13, 1.56]), whose association was not statistically significant. The difference between the Asian and white groups

on the association between having cognitive impairment and financial strain was statistically significant (β = -1.77, 95% CI = [-2.81, -0.74]).

Table 12

Race/ethnicity as a Moderator Between Difficulty Concentrating, Remembering and Making Decisions (Cognitive Impairment) and Financial Strain

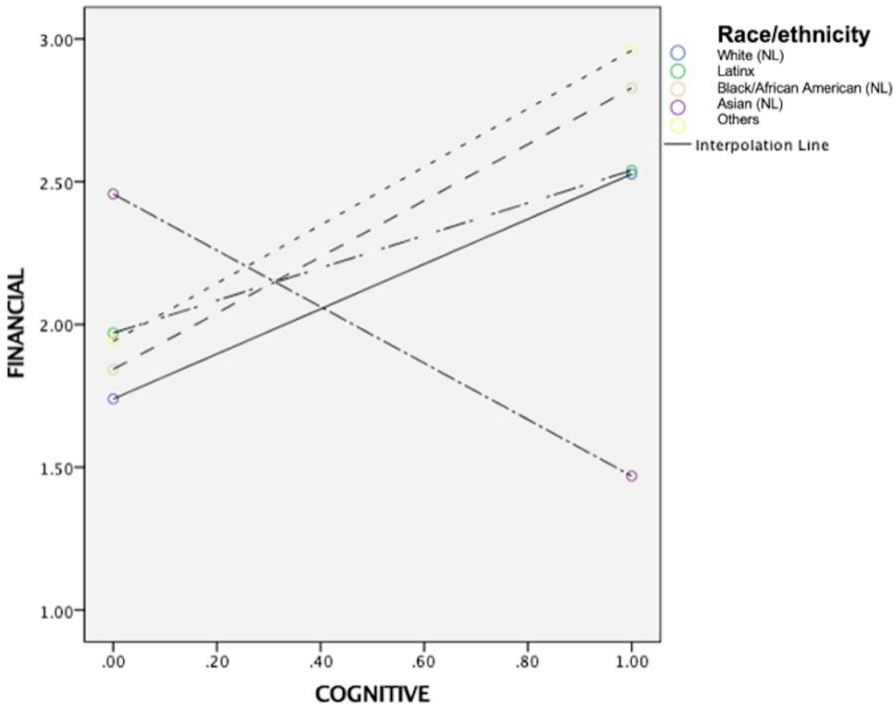
Predictor(s)	Coefficient	Confidence interval
Difficulty concentrating, remembering, and making decisions (cognitive impairment)	0.79**	0.58, 0.99
Race/ethnicity		
White, non-Latinx (NL)	Ref	Ref
W1: Latinx	0.23	-0.12, 0.59
W2: Black/African American only (NL)	0.1	-0.51, 0.71
W3: Asian (NL)	0.72	-0.13, 1.56
W4: Others	0.2	-0.36, 0.77
Cognitive impairment * Race/ethnicity		
Cognitive impairment X W1	-0.22	-0.67, 0.24
Cognitive impairment X W2	0.2	-0.56, 0.95
Cognitive impairment X W3	-1.77**	-2.81, -0.74
Cognitive impairment X W4	0.23	-0.48, 0.94
Cognitive impairment * Race/ethnicity interaction	$F(4, 2009) = 3.27$, $p<0.05$	
Moderator: Race/ethnicity	Conditional direct effect of X on Y	
	Effect	Confidence interval
White, non-Latinx (NL)	0.79**	0.58, 0.99
Latinx	0.57**	0.16, 0.98
Black/African American only (NL)	0.99**	0.26, 1.71
Asian (NL)	-0.99	-2.00, 0.03
Others	1.02**	0.33, 1.70

* $p<0.05$; ** $p<0.01$

Note. This model controls for age, gender, family status, education, employment, poverty level, time of data collection

Figure 5

Association Between Difficulty Concentrating, Remembering and Making Decisions (Cognitive Impairment) and Financial Strain by Racial/ethnic Group



There was a significant interaction between having difficulty doing errands alone (IADLs) and race/ethnicity on self-rated health ($F = 2.96$, $p<0.05$) (See Table 13). Simple slope analyses (See Figure 6) showed that the negative association between having difficulty doing errands alone (IADLs) and self-rated health was stronger for others ($\beta = -0.61$, 95% CI = [-0.96, -0.26]) and white participants ($\beta = -0.41$, 95% CI = [-0.51, -0.30]) than it was for other racial/ethnic groups, whose associations were not statistically significant. The difference between the Latinx and white groups on the association between having difficulty doing errands alone (IADLs) and self-rated health was statistically significant ($\beta = 0.31$, 95% CI = [0.08, 0.54]).

Table 13

Race/ethnicity as a Moderator Between Difficulty Doing Errands Alone (IADLs) and Self-rated Health

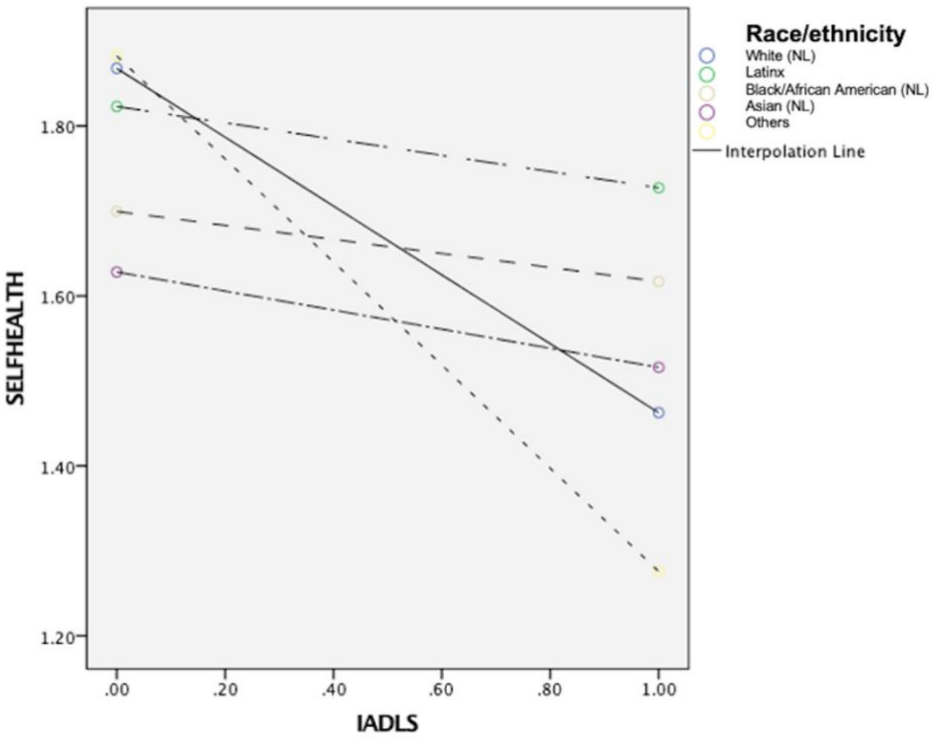
Predictor(s)	Coefficient	Confidence interval
Difficulty doing errands alone (IADLs)	-0.41**	-0.51, -0.30
Race/ethnicity		
White, non-Latinx (NL)	Ref	Ref
W1: Latinx	-0.05	-0.21, 0.12
W2: Black/African American only (NL)	-0.17	-0.44, 0.11
W3: Asian (NL)	-0.24	-0.57, 0.09
W4: Others	0.01	-0.26, 0.29
Difficulty doing errands alone (IADLs) * Race/ethnicity		
Difficulty doing errands alone (IADLs) X W1	0.31**	0.08, 0.54
Difficulty doing errands alone (IADLs) X W2	0.32	-0.05, 0.70
Difficulty doing errands alone (IADLs) X W3	0.29	-0.24, 0.82
Difficulty doing errands alone (IADLs) X W4	-0.2	-0.56, 0.16
X*W interaction	$F(4, 2009) = 2.96$, $p<0.05$	
Moderator: race/ethnicity	Conditional direct effect of X on Y	
	Effect	Confidence interval
White, non-Latinx (NL)	-0.41**	-0.51, -0.30
Latinx	-0.1	-0.31, 0.11
Black/African American only (NL)	-0.08	-0.44, 0.28
Asian (NL)	-0.11	-0.63, 0.41
Others	-0.61**	-0.96, -0.26

* $p<0.05$; ** $p<0.01$

Note. This model controls for age, gender, family status, education, employment, poverty level, time of data collection

Figure 6

Association Between Difficulty Doing Errands Alone (IADLs) and Self-rated Health by Racial/ethnic Group



Moderated Moderation Analyses Results

Two statistically significant moderated moderation effects were found across all models tested: 1) Interaction between age and COVID-19 pandemic-related acute stress on the direct association between difficulty doing errands alone (IADLs) and serious psychological distress; 2) Interaction between race/ethnicity and COVID-19 pandemic-related acute stress on the direct association between financials strain and serious psychological distress.

Interaction Between Age and COVID-19 Pandemic-related Acute Stress. Table 14 shows that the association between having difficulty doing errands alone (IADLs) and serious psychological distress differed by the interaction between the COVID-19 pandemic and age ($F = 3.14$, $p<0.05$). Simple slope analysis showed that the association between difficulty doing errands alone (IADLs) and serious psychological distress was stronger for the young age group during the pandemic ($\beta = 3.35$, 95% CI = [1.73, 4.97]) compared to the association for this group

before the COVID-19 pandemic (β = 1.79, 95% CI = [0.41, 3.16]) (See Figure 7). However, the difference between these two slopes was not statistically significant.

Table 14

Interaction Between Age and COVID-19 Pandemic on the Association Between Having Difficulty Doing Errands Alone (IADLs) and Serious Psychological Distress

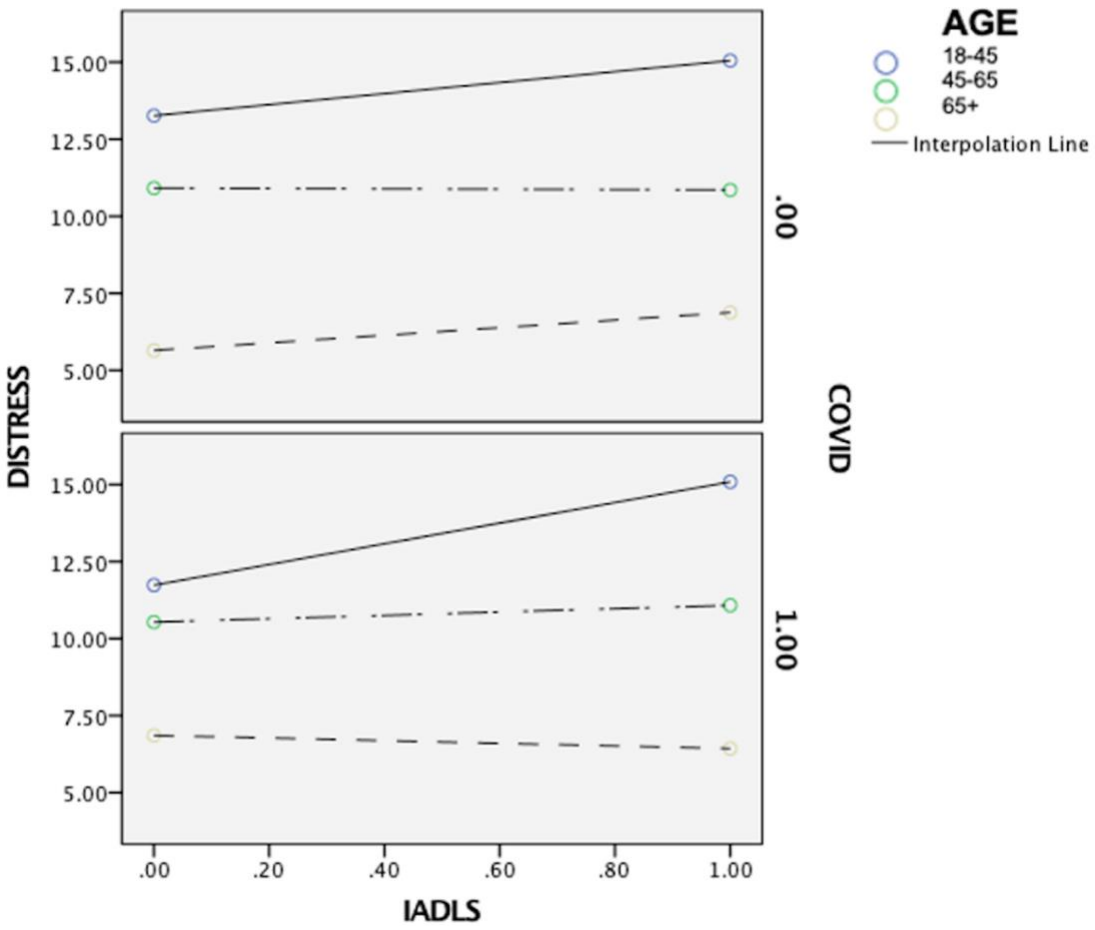
Predictor(s)		Coefficient	Confidence interval
Difficulty doing errands alone (IADLs) (X)		1.79*	0.41, 3.16
Age (W)			
18-45		Ref	Ref
	W1: 45-65	-2.35**	-3.63, -1.07
	W2: 65+	-7.62**	-8.96, -6.27
X*W			
Difficulty doing errands alone (IADLs) X W1		-1.85*	-3.67, -0.03
Difficulty doing errands alone (IADLs) X W2		-0.56	-2.34, 1.22
COVID-19 Pandemic (Z)		-1.53*	-2.83, -0.22
X* Z			
Difficulty doing errands alone (IADLs) X Z		1.56	-0.55, 3.68
W* Z			
	W1 X Z	1.15	-0.69, 2.99
	W2 X Z	2.74**	0.92, 4.56
X*W*Z			
Difficulty doing errands alone (IADLs) X W1 X Z		-0.96	-3.76, 1.84
Difficulty doing errands alone (IADLs) X W2 X Z		-3.22*	-5.92, -0.52
	X*W*Z interaction	$F(2, 2008) = 3.14$, $p < 0.05$	
Moderator (W): Age	Moderator (Z): COVID-19 Pandemic	Conditional effects of X on Y: Effect	Confidence interval
18-44	No	1.79*	0.41, 3.16
	Yes	3.35**	1.73, 4.97
45-64	No	-0.06	-1.27, 1.15
	Yes	0.54	-0.87, 1.95
65 +	No	1.23*	0.10, 2.37
	Yes	-0.43	-1.66, 0.81

* $p<0.05$; ** $p<0.01$

Note. This model controls for race/ethnicity, gender, family status, education, employment, poverty level

Figure 7

Association Between Difficulty Doing Errands Alone (IADLs) and Serious Psychological Distress by Interactions Between Age and COVID-19 Pandemic-related Acute Stress



Interaction Between Race/ethnicity and COVID-19 Pandemic-related Acute Stress.

Table 15 shows that the association between financial strain and serious psychological distress differed by the interaction between the COVID-19 pandemic and race/ethnicity ($F = 2.48$, $p<0.05$). Simple slope analysis showed that the association between financial strain and serious psychological distress was stronger during the COVID-19 pandemic for Latinx ($\beta = 1.02$, 95% CI = [0.58, 1.45]) than it was before the COVID-19 pandemic ($\beta = 0.54$, 95% CI = [0.14, 0.93]). Similarly, the association between financial strain and serious psychological distress was

stronger during the COVID-19 pandemic for Black/African Americans (β = 1.29, 95% CI = [0.52, 2.05]) than it was before the COVID-19 pandemic (β = 0.85, 95% CI = [0.14, 1.56]). The association between financial strain and serious psychological distress was stronger during the COVID-19 pandemic for others (β = 1.35, 95% CI = [0.65, 2.04]) that it was before, although this association was not statistically significant. In contrast, the association between financial strain and serious psychological distress was stronger for white participants before the COVID-19 pandemic (β = 0.92, 95% CI = [0.71, 1.12]) compared with the association for this group during the COVID-19 pandemic (β = 0.72, 95% CI = [0.48, 0.97]) (See Figure 8).

Table 15

Interaction Between Race/ethnicity and COVID-19 Pandemic on the Association Between Financial Strain and Serious Psychological Distress

Predictor(s)		Coefficient	Confidence interval
Financial Strain (X)		0.92**	0.71, 1.12
Race/ethnicity (W)			
	White, non-Latinx (NL)	Ref	Ref
	W1: Latinx	0.36	-1.13,1.86
	W2: Black/African American only (NL)	0.61	-1.72, 2.94
	W3: Asian (NL)	2.54	-0.23, 5.32
	W4: Others	2.54*	0.17, 4.90
X*W			
	Financial strain X W1	-0.38	-0.82, 0.07
	Financial strain X W2	-0.07	-0.80, 0.67
	Financial strain X W3	-0.89	-1.84, 0.07
	Financial strain X W4	-0.73*	-1.45, -0.02
COVID-19 Pandemic (Z)		0.29	-0.59, 1.17
X* Z		-0.19	-0.51, 0.12
W* Z			
	W1 X Z	-0.9	-3.03, 1.23
	W2 X Z	-4.17*	-7.81, -0.54
	W3 X Z	0.39	-4.21, 4.50
	W4 X Z	-3.91*	-7.34, -0.48
X*W*Z			
	Financial strain X W1 X Z	0.67*	0.01, 1.34
	Financial strain X W1 X Z	0.63	-0.45, 1.72

	Financial strain X W1 X Z	0.4	-1.24, 2.05
	Financial strain X W1 X Z	1.36**	0.33, 2.38
	X*W*Z interaction		$F(4, 2000) = 2.48$, $p < 0.05$

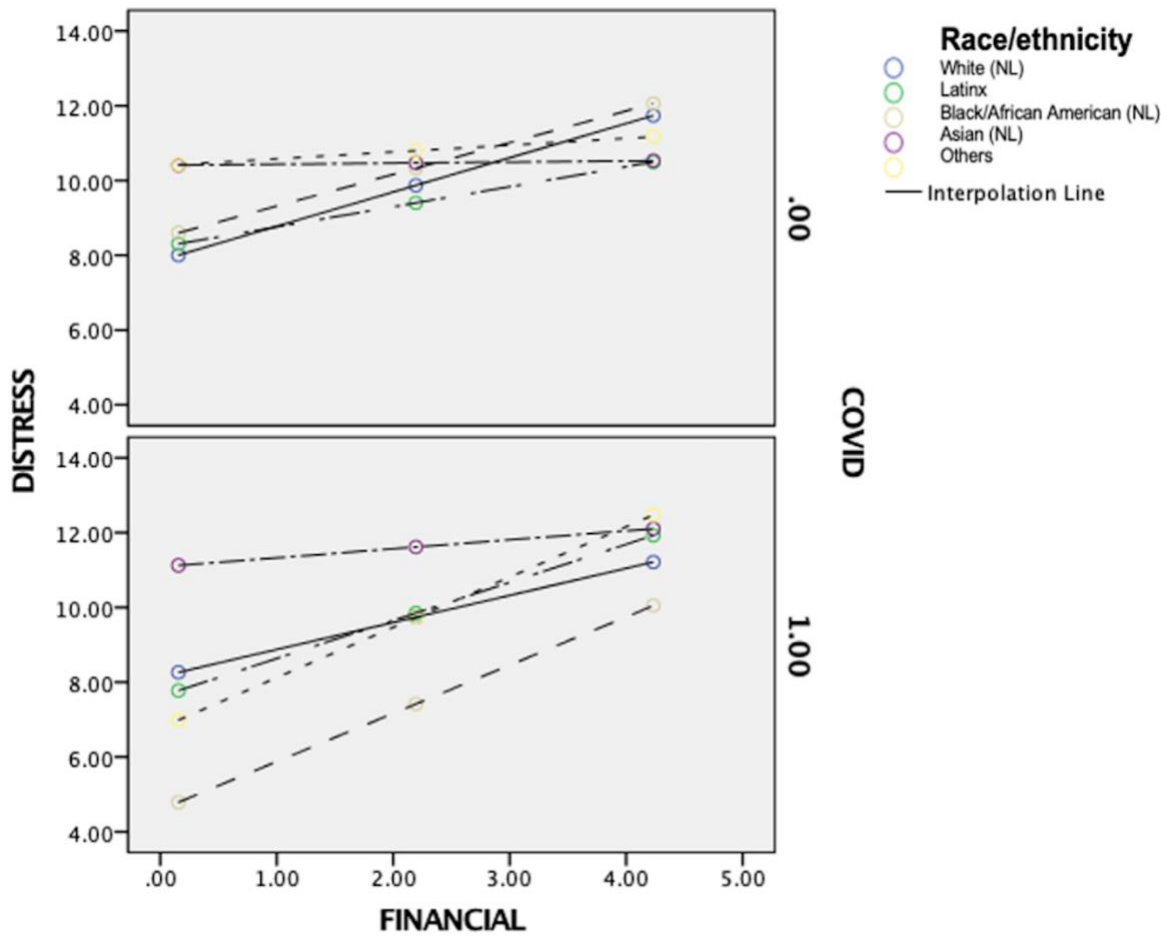
Moderator (W): Race/Ethnicity	Moderator (Z): COVID-19 Pandemic	Conditional effects of X on Y	
		Effect	Confidence interval
White, non-Latinx (NL)	No	0.92**	0.71, 1.12
	Yes	0.72**	0.48, 0.97
Latinx	No	0.54**	0.14, 0.93
	Yes	1.02**	0.58, 1.45
Black/African American only (NL)	No	0.85*	0.14, 1.56
	Yes	1.29**	0.53, 2.05
Asian (NL)	No	0.03	-0.90, 0.96
	Yes	0.24	-1.08, 1.56
Others	No	0.18	-0.51, 0.87
	Yes	1.35**	0.65, 2.04

* $p<0.05$; ** $p<0.01$

Note. This model controls for age, gender, family status, education, employment, poverty level

Figure 8

Association Between Difficulty Doing Errands Alone (IADLs) and Serious Psychological Distress by Interactions Between Age and COVID-19 Pandemic-related Acute Stress



Moderated Mediation Analyses Results

Age significantly and partially moderated the mediation association between having difficulty doing errands alone (IADLs) and serious psychological distress through financial strain (See Table 16). The indirect effects between difficulty doing errands alone (IADLs) and serious psychological distress through financial strain were significantly for young (β = 0.59, 95% CI = [0.29, 0.98]) and middle-aged participants (β = 0.44, 95% CI = [0.17, 0.75]), but were not significantly for older participants (β = 0.13, 95% CI = [-0.04, 0.13]). The difference in indirect effects between these two groups was also significant, which indicated that the indirect effects between difficulty doing errands alone (IADLs) and serious psychological distress through

financial strain was significantly stronger for young participants than middle-aged participants (Contrast of effects = 0.47, BootCI = [-0.88, -0.11]).

Table 16

Age Moderated the Mediation Association Between Having Difficulty Doing Errands Alone (IADLs), Financial Strain, and Serious Psychological Distress

	Outcomes					
	M (Financial Strain)			Y (Serious psychological distress)		
Predictor (s)	Coefficient	SE	Confidence interval	Coefficient	SE	Confidence interval
Direct effect						
Difficulty doing errands alone (IADLs) (X)	0.83**	0.17	0.50, 1.17	1.92**	0.53	0.88, 2.96
Financial strain (M)	-	-	-	0.71**	0.12	0.47, 0.95
Age (W): 18-44	Ref	Ref	Ref	Ref	Ref	Ref
Age (W): 45-64	0.49**	0.15	0.20, 0.79	-2.52**	0.60	-3.71, -1.34
Age (W): 65+	-0.25	0.17	-0.58, 0.07	-6.17**	0.60	-7.34, -4.99
Indirect effect (X by W)						
Difficulty doing errands alone (IADLs) by Age: 18-44	Ref	Ref	Ref	Ref	Ref	Ref
Difficulty doing errands alone (IADLs) by Age: 45-64	-0.32	0.22	-0.75, 0.12	-2.19**	0.70	-3.55, -0.82
Difficulty doing errands alone (IADLs) by Age: 65+	-0.65**	0.22	-1.08, -0.23	-1.58*	0.67	-2.90, -0.26
Financial strain by Age (M by W)						
Financial strain by Age: 18-44		-		Ref	Ref	Ref
Financial strain by Age: 45-64		-		0.15	0.16	-0.18, 0.47
Financial strain by Age: 65+		-		-00.01	0.17	-0.34, 0.32
Conditional direct effect of X on Y by moderators						
Age: 18-44		-		1.92**	0.53	0.88, 2.96
Age: 45-64		-		-0.27	0.46	-1.18, 0.64
Age: 65+		-		0.34	0.42	-0.48, 1.15
Conditional indirect effect of X on Y by moderators						
Age: 18-44		-		0.59**	0.18	0.29, 0.98
Age: 45-64		-		0.44**	0.15	0.17, 0.75
Age: 65+		-		0.13	0.09	-0.04, 0.31
	R^2 = 0.15			R^2 = 0.29		
	F(12, 2013), p<0.001			F(15, 2010), p<0.001		

* p<0.05; ** p<0.01

Note. This model controls for race/ethnicity, gender, family status, education, employment, poverty level, time of data collection

Discussion

Overview of Findings

This study is among the first to examine the association between disability status, financial strain, and subjective health and well-being for older adults and adults with disabilities, two groups of people with LTSS needs. People with more disability difficulties were more likely to experience financial strain and worse subjective health and well-being. Those with more financial strain experienced worse subjective health and well-being. Significant indirect associations were consistently found between disability status and subjective health and well-being through financial strain, across multiple measures of disability status and subjective health and well-being. People with different types of disability difficulties tended to experience various financial difficulties. For example, people with cognitive impairment needed more financial support from others and had specific financial difficulty in housing, food, and saving for retirement compared to those without cognitive impairment. People with cognitive impairment also tended to have more financial strain than those without cognitive impairment. People with different types of disability difficulties tended to report differently in self-rated health and serious psychological distress. For example, people with cognitive impairment tended to report more serious psychological distress compared to those without cognitive impairment. People with difficulty in dressing and bathing (ADLs) or doing errands alone (IADLs) tended to report worse self-rated health than those without these disability difficulties. People experiencing financial difficulties in housing, food, or spending on medical care reported lower levels of self-rated health than those without these financial difficulties. People experiencing any financial difficulty suffered more serious psychological distress than those without any financial difficulties.

This study also explored potential age and race/ethnicity disparities among people with LTSS needs. In general, young and middle-aged adults and racial/ethnic minorities with LTSS needs had more financial strain and worse subjective health and well-being than older adults and their white counterparts. Several focal associations were significantly stronger for young participants and certain racial/ethnic groups than for middle-aged or older participants and other racial/ethnic groups, such as whites. For example, the association between having difficulty doing errands alone (IADLs) and financial strain was stronger for young participants than older participants. The association between disability index and financial strain was stronger for young participants than older participants. The association between disability index and serious psychological distress was stronger for young participants than middle-aged and older participants. The positive association between having cognitive impairment and financial strain was stronger for Black/African American and other participants. The negative association between having difficulty in doing errands alone (IADLs) and self-rated health was stronger for white and other participants. Furthermore, the indirect effect exhibited between having difficulty doing errands alone (IADLs) and serious psychological distress through financial strain was significantly stronger for young participants than middle-aged participants.

Although this study did not demonstrate the effect of the COVID-19 pandemic on focal associations, the association between difficulty doing errands alone (IADLs) and serious psychological distress was stronger for young participants during the pandemic compared with the association for this group before the COVID-19 pandemic. Moreover, the association between financial strain and serious psychological distress was stronger during the Covid-19 pandemic for Latinx and Black/African American participants compared with the association for these groups before the COVID-19 pandemic.

Research and Conceptual Implications

Application of Pearlin's Stress Process Model to the Population of People with LTSS Needs

This study contributes to the literature by applying Pearlin's Stress Process Model to the population of people with LTSS needs, including older adults and adults with disabilities in California. Previous studies have applied Pearlin's model to investigate the stress process for older adults (Aranda & Lincoln, 2011; Brown et al., 2020), people with dementia (Dawson et al., 2013), and caregivers (Pearlin et al., 1990; Pearlin et al., 1997; Roland & Chappell, 2017). However, few studies have applied the model to examine people with LTSS needs, who represent those among the least socially and economically privileged members of our society, and who are at greatest risk of exposure to health-related stressors (Pearlin et al., 2005). This study is among the first to provide empirical evidence by examining multiple types of disabilities (e.g., people with cognitive impairment, difficulty in ADLs, difficulty in IADLs) and their associations with financial strain and health and well-being, which corresponds to the importance of addressing disability differences in health disparities studies (Goode et al., 2014).

The current study results show that people with cognitive impairment needed more financial support from others and had specific unmet needs for housing, food, and saving for retirement. They also experienced more financial strain than people who did not have this disability difficulty. One explanation may be that people with developmental disabilities have the lowest rates of labor force participation compared to people with other disabilities, and employment provides opportunities for financial autonomy (Khayatzadeh-Mahani et al., 2020). Another explanation could be that people with mild cognitive impairment had more challenges to their financial literacy, such as financial conceptual knowledge, and may experience challenges

handling cash transactions, bank statement management, and bill payment when compared with cognitively healthy people (Jekel et al., 2015). Therefore, people with cognitive impairment may have had more difficulties in managing their finances.

People with ADL or IADL difficulties were more likely to report worse self-rated health. This finding was consistent with a previous study's finding that difficulties in ADLs impacted older males' self-rated health (Hoeymans et al., 1997). However, Hoeymans et al.'s (1997) study did not find that difficulties in IADLs' impact on older males' self-rated health, which is difference from the current study. This inconsistency may reflect the modifying effect of age and gender on the association between difficulties in IADLs and self-rated health (Hoeymans et al., 1997). Moreover, this study found that people with cognitive impairment tended to experience more serious psychological distress. Previous studies have supported the association between cognitive impairment and higher depression (e.g., Roca et al., 2015; Rock et al., 2014). No associations were found between having difficulties in ADLs or IADLs and serious psychological distress in this study, a pattern that contrasts with findings that depression was generally substantially elevated among those with physical disabilities (Turner & Turner, 2004). This may be due to the sample differences of these studies: the current study focused on comparing people with at least one type of disability, while Tuner and Turner's (2004) study compared people with and without disabilities. It may also be due to the measure differences as this study uses the K6 scale to measure serious psychological distress, which includes both depression and anxiety measures. This study also found that people with more disability difficulties had worse subjective health and well-being. This is supported by previous findings that people's subjective well-being decreased with the severity of disability (Uppal, 2006). All

these results inform the need to address disability disparities and how to target resources to respond to those most in need.

Indirect Associations between Disability Status and Subjective Health and Well-being through Financial Strain

Informed by the Pearlin's Stress Process Model, this study found that the secondary stressor of financial strain exacerbated the primary stressor of disability difficulty on the subjective health and well-being of people with LTSS needs. Indirect associations were consistently found between disability status (individual and cumulative) and subjective health and well-being (self-rated health and serious psychological distress) through financial strain. Several previous studies have also found that financial strain mediated the relationships between social location factors and health-related outcomes. For example, Aranda and Lincoln (2011) found that financial strain mediated the effects of sociocultural (nativity status, years of U.S. residence) and social status factors (age, education) on depressive symptoms among low-income Latinxs. Shippee et al. (2020) found that the relationship between race/ethnicity and self-rated health for older adults receiving publicly funded home- and community-based services was mediated by financial strain. Wolbring (2011) found that adverse repercussions of disability, combined with poor social and living situations, perpetuate negative health and life outcomes based on a study in Haiti. This study contributes to the literature by examining the mediator role of financial strain between disability status and the subjective health and well-being of people with LTSS needs. The results inform the need to address financial strain and provide more financial supports to people with LTSS, which will improve their health and well-being.

Multiple Factors that Contribute to Financial Strain

This study used a comprehensive measure to assess and account for multiple factors that may contribute to financial strain (e.g., costs of housing, medical expense/healthcare, and food; available income and savings), which is lacking in previous studies. For people with LTSS needs, the data shows that those who had financial difficulties related to housing, food, and spending on medical care reported worse self-rated health. The role played by these institutional sectors were highlighted in previous studies wherein families with disabled children experienced significantly greater financial hardships, including food insecurity, housing instability, and healthcare access, than those who did not have disabled children (Fujiura & Yamaki, 2000; Parish et al., 2008; Scherer et al., 2019). In this study, people with any financial difficulty were to have more serious psychological distress than those without any financial difficulties. Similarly, previous studies found associations between financial strain and health and well-being outcomes; however, these studies were conducted separately for older adults and young people with disabilities (e.g., Aranda & Lincoln, 2011; Honey et al., 2011; Kavanagh et al., 2016; Mandemakers & Monden, 2010). This study contributed to the literature by examining the association between financial difficulty and two subjective health and well-being outcomes across all adult age groups for people with LTSS needs. Consistent with Elbogen et al.'s (2020) study showing that financial stressors were cumulative, this study found that the more financial difficulties people with LTSS needs had, the worse self-rated health and more serious psychological distress they experienced. Therefore, apart from individual financial difficulties, the cumulative impact of financial strain on the subjective health and well-being of people with LTSS needs should also be examined. The multiple aspects of financial difficulties correspond to

various LTSS programs related to nutrition, housing, social services, and health services, which will inform the development and improvement of related policies and programs.

Combined Effect of Financial Strain and COVID-19 Pandemic-related Acute Stress

This study also expanded the application of Pearlin's Stress Process Model by examining the effects of chronic stressor of financial strain and the acute stressor of the COVID-19 pandemic on people's subjective health and well-being. Previous studies of people from various populations have only separately examined the associations between financial strain and subjective health and well-being (e.g., Scherer et al., 2019) and the associations between the COVID-19 quarantine and subjective health and well-being (e.g., Marroquín et al., 2020). However, people with LTSS needs are especially vulnerable to financial strain, which is likely compounded by the COVID-19 burden. It is essential to consider the combined effects of these two stressors rather than solely focusing on the consequences of an individual stressor (Brown & Hargorve, 2018). This study found that, for the Latinx and Black/African Americans represented in this study, the association between financial strain and serious psychological distress was stronger during the COVID-19 pandemic than it was before the COVID-19 pandemic. It suggests that the combined effect of financial strain and the COVID-19 pandemic had a stronger impact on Latinx and Black/African Americans' mental health. This finding is consistent with emerging data that show people of color have a higher burden of illness from COVID-19 than their white peers (Hedgpeth et al., 2020; Scott, 2020; Shippee et al., 2020). Overall, this study did not find many significant results related to the COVID-19 pandemic. This may be because the study sample did not include people living in institutions, who were most severely impacted by the pandemic (Barnett & Grabowski, 2020). This may also reflect the use of the "Stay-at-home"

order as a threshold. People may not have experienced the seriousness of the pandemic for some time after this order. Moreover, for the young age group, the association between having difficulties with IADLs and serious psychological distress was stronger during the pandemic than it was before the COVID-19 pandemic. This finding is similar to Hatch & Dohrenwend's (2007) finding that both traumatic and other stressful events were reported more by younger age groups. As such, this study contributes to examining the combined effects of multiple stressors and can inform future applications of Pearlin's Stress Process Model (Pearlin & Bierman, 2013).

Age and Race/ethnicity Differences of People with LTSS Needs

Disability appears to be more damaging to health for certain groups, and stress proliferation is likely not uniformly experienced by all individuals confronting the same difficult life circumstances. This study contributes to Pearlin's Stress Process Model by providing empirical evidence of supporting how stressful experiences can be traced back to surrounding social structures and people's locations within them, such as their age and race/ethnicity. This study is among the first to examine multiple and specific financial difficulties and their impact on subjective health and well-being of young, middle-aged, and older adults with disabilities. It also moves beyond the white/Black disparities analysis that has been performed (Shippee et al., 2020). This study also contributes to research on health disparities by assessing intersections between disability and age or race/ethnicity (Goode et al., 2014).

These study data show that young adults were more likely to have cognitive impairment, while older adults had a higher chance of having ADLs and IADLs difficulties. This pattern is consistent with previous studies focusing on young and middle-aged adults with intellectual and developmental disabilities (e.g., Emerson & Hatton, 2007; Lovgren, 2015; Neece et al., 2020)

and older adults with physical disabilities (e.g., Friedman et al., 2018). Notably, young and middle-aged adults with LTSS needs struggled to make financial ends meet. They experienced more financial difficulties on average than their older counterparts, which is consistent with a previous finding that older patients perceived less financial strain from difficulty paying bills than younger patients if they had the same household financial stress levels (Benoit Francoeur, 2005). This may be because younger adults are likely to be less financially stable before acquiring a disability than older adults (Soh et al., 2013). This study data shows that middle-aged adults with LTSS needs were more likely to have multiple unmet financial needs related to housing, paying for medical bills, savings, food, and income than other age groups. Young adults were more likely to receive or borrow money from others than other age groups. Therefore, addressing specific financial challenges, such as housing, food, healthcare expense, and income, deserves more attention for young and middle-aged adults aging with disabilities. We can reasonably assume that if their housing issues cannot be addressed, more people with disabilities will receive care in institutions settings instead of using home- and community-based services. This study also found different patterns of self-rated health and serious psychological distress by age group. The data shows that middle-aged and older adults with LTSS needs reported worse self-rated health and young adults with LTSS needs were more likely to experience serious psychological distress. Ne'eman et al.'s (2022) found that many young and middle-aged people in nursing homes had serious mental illness.

When examining the role of race/ethnicity, the current study found that people from specific racial/ethnic groups had different disability statuses. In California, Black/African American and Asian adults with LTSS needs were more likely to have cognitive impairments than other groups. Black/African American adults were also more likely to have difficulties in ADLs.

Similarly, previous studies have found that higher percentages of Black Americans had limitations in ADLs and IADLs than white Americans (National Center for Health Statistics, 2013; Thach & Wiener, 2018). One study focusing on low-income Latinxs showed that older Latinxs experienced more financial strain and had increased depressive symptoms than younger Latinxs (Aranda & Lincoln, 2011). Another study found that while racial/ethnic minorities tended to report more exposure to stressors than whites, they did not exhibit the expected increase in serious psychological distress (Brown et al., 2020). This finding may be due to the fact that Brown et al.'s (2020) study focused on adults 52 + years of age in the U.S. and did not include young adults with disabilities, who were found to have more serious psychological distress in this study. All of these findings can inform the development of racially and ethnically appropriate LTSS systems for racial/ethnic minorities. The findings will inform policymakers who are interested in addressing health disparities to develop targeted policies for people with unmet needs.

Informing More Data and Evidence-based Empirical Studies

Though emerging studies have started focusing on people with LTSS needs, many used qualitative methods due to a lack of available quantitative data (Lovgren, 2015; Khayatzadeh-Mahani, 2020; Travers et al., 2021). The CA-LTSS study is the most comprehensive population-level dataset that supports the examination of disparities in access to care, services, supports, unmet needs, and uses of LTSS by adults in California. This study can be used to inform and encourage investment in more cross-sectional and longitudinal data and evidence-based empirical LTSS studies in other states and at the federal level, such as more funding support from the National Institutes of Health and other funders. Centers for Medicare & Medicaid

Services should also consider incorporating community resources related to family support, housing, finances, and others for people with LTSS needs at all levels (i.e., federal, state, and local) and across multiple sectors (Ne'eman et al., 2022). More funding should be provided to develop evidence-based programs and practices for people aging with disabilities and to support collaboration and coordination across different institutional sectors and provider types (Putnam, 2014).

Policy and Program Implications

This study's findings can inform the development of policies and practices to alleviate economic disparities and make LTSS more affordable and accessible for people with diverse LTSS needs. Since no one size fits all, we need to address the financial needs of specific groups of people and target policies and service programs to meet their particular needs. The differences between young and older adults have failed to be acknowledged in nursing homes by existing public policies (Ne'eman et al., 2022). Little is known about age differences in LTSS needs in home and community-based settings. The current study finding shows that young adults who experienced difficulties with IADLs tended to have more financial strain than older adults with this difficulty and also tended to have more serious psychological distress than middle-aged or older adults. This finding supports a previous study that that age had a modifying effect on the association between difficulties in IADLs and self-rated health (Hoeymans et al., 1997). Moreover, in this study, young adults with more disability difficulties tended to experience more financial strain and more serious psychological distress than middle-aged and older adults with LTSS needs. The association between having difficulties in IADLs and serious psychological distress through financial strain was stronger for young adults than middle-aged adults. All of

these findings were consistent with studies conducted in Australia finding that young people (aged 15-29) with disabilities were more likely than their peers to live under conditions that were detrimental to their mental health, including financial hardship (Emerson et al., 2009; Honey et al., 2011). Therefore, more financial support and mental health services should be provided to young adults who experience IADL difficulties, and those with multiple disability difficulties. The findings of this study suggest the value of understanding the diverse needs of younger and middle-aged people with disabilities in non-institutional settings and providing them with more appropriate HCBS. If their needs are not effectively addressed at home and in the community, the LTSS system will pay more when they receive institutional care. It is essential to ensure that younger people with disabilities are not ignored relative to their more numerous older counterparts and that the long-standing federal goal of expanding diversion and transition efforts for people with disabilities of all ages can be accomplished (Ne'eman et al., 2022).

Policies should also address the unmet financial needs of racial/ethnic minorities, such as Black/African American, Latinx, Asians, and other racial/ethnic minorities. The current study found that racial/ethnic minorities had their own specific financial difficulties. For example, Latinx and Asians were found to report more difficulties related to housing, Black/African Americans had more difficulties related to food, and Latinxs and Black/African Americans were more likely to receive or borrow money from others. It is worth noting that Asian adults with LTSS needs also reported more serious psychological distress than other racial/ethnic groups. This finding is similar to Shippee et al.'s (2020) finding that Asian older adults who received publicly funded HCBS reported the lowest self-rated health compared to white participants. This finding could be explained by the frequent experience of negative mood among Asian older adults more than other older adults (Shippee et al., 2020). These findings challenged the notion

of "model minority" for Asian older adults and adults with disabilities. Therefore, developing racially and ethnically appropriate LTSS policies and programs is integral for historically underserved minorities.

To the extent that state government (e.g., California) is unable to fully fund a universal LTSS programs, rebalancing programs can improve the efficiency among existing LTSS networks. Programs and policies that provide LTSS to adults in the U.S. are usually segmented by consumers' age and nature of disability (Putnam, 2014). This study calls for looking at issues facing the entire population with LTSS needs and addressing the diversity of their unmet needs. Consumer-driven models can also help provide individualized support, and lower unmet needs (Angelelli et al., 2022). Policymakers could prioritize programs targeting people with cognitive impairment to improve access to housing, food, and retirement savings. Moreover, this study found that people with more disability difficulties experienced more financial strain. This finding is consistent with previous studies finding that people with disabilities are more likely than others to experience financial hardship, and disability represents a potential adversity that may be exacerbated by the effects of economic hardship (Honey et al., 2011). Policymakers could prioritize services programs targeting people with multiple types of disability statuses. More mental health services should be provided for people with multiple disability difficulties. Outreaching and delivering mental health services could tailor to meet the specific needs of racial/ethnic groups, such as Asians. During the COVID-19 pandemic, urgent mental health assistance is essential to support Latinx and Black/African Americans with more financial challenges. To improve the financial capacity of people with cognitive impairments, programs related to managing finances need to be targeted to this population (Jekel et al., 2015).

In the context of the 10-year Master Plan for Aging in California, empirical findings from this study can be used to guide state funding and target social services programs and policies that meet the financial needs of older adults and adults with disabilities in terms of housing, food, medical care, and other necessary expenses. Advancing policies that make LTSS more affordable and accessible can improve individuals' health, well-being, and quality of life while also reducing the costs borne by the state by avoiding unnecessary and costly institutional care (Chen & Kietzman, 2022). Several MPA goals are closely related to this study. For example, the goal of "affording aging" is to close the equity gap and increase elder economic self-sufficiency. This corresponds to this study's examination of financial strain by social locations for people with LTSS needs. "Healthy reimagined" aims to close the equity gap and increase life expectancy, bringing the equity lens to health and well-being. The MPA also mentions the importance of addressing these goals during the COVID-19 Pandemic (California Department of Aging, 2021). This study provides evidence of the need to develop targeting and rebalancing policies and programs for people with unmet financial needs. It further encourages the MPA to pay attention to the sectors of housing, food, and spending on medical care for people with LTSS needs.

The study findings also provide insights for states and federal LTSS policies and programs in the U.S. Medicaid is the largest provider of LTSS, covering nursing homes (long-term care) and HCBS. California's Medicaid, known as "Medi-Cal," is a healthcare program for low-income seniors, adults, and children living at or below 138% of the federal poverty level. However, the federal poverty level is not a sufficient measure from which to address the unmet needs of people with LTSS needs, given the economic disparities of disability status, age, and race/ethnicity found in this study. Therefore, related LTSS programs should target people based on their needs, informed by their distinct characteristics and circumstances, instead of being based on their

household income levels. For example, developing a standardized and uniform assessment of level of LTSS needs across programs and disability categories helps promote equity in service provision (AAPR, 2013; Kaye, 2014). Programs that can help address unmet LTSS needs include but are not limited to In-Home Supportive Services (IHSS), Community-Based Adult Services (CBAS), and the Multi-Purpose Senior Services Program (MSSP). IHSS is a Medi-Cal program that pays for personal care assistance with ADLs and IADLs for individuals at risk for nursing home placement. While it serves individuals of all ages, about 60% of IHSS consumers are 60 years and older. This study's findings suggest that these programs may need to reach and be better tailored to the needs of younger adults with disabilities, especially those with multiple disability difficulties. CBAS provides therapeutic services (both medical and social) for adults 18 and older with one or more chronic or post-acute conditions, two or more difficulties in ADLs, and insufficient family support. These programs need to expand their focus on Asian adults with LTSS needs. Similar to developing MSSP to serve older adults, more programs and services are needed to address the diverse needs of younger adults with disabilities.

This study's findings regarding specific financial difficulties for subgroups of people with LTSS needs will be informative to target related programs to meet their diverse financial needs and improve the efficiency of these programs. Medicaid should prioritize covering costs for specific sectors, such as housing, food, and healthcare services. For households with members needing LTSS, secure housing is the cornerstone to meaningful community living and a critical component among social determinants of health and well-being (Gibson et al., 2011). This may be the most important factor enabling individuals with LTSS needs to live in the community and not in an institution, though Medicaid usually did not pay for housing and other needs not incorporated in the HCBS package (Meschede et al., 2022; Ne'eman et al., 2022). However,

since 2022, Arizona and Oregon have started experimental programs using Medicaid money for housing. Similarly, in California, Gov. Newsom has proposed spending more than $100 million per year in the state's Medicaid program to pay for up to six months of housing for people who are or risk becoming homeless (Hart, 2023). Regarding the food sector, home-delivered meal programs provide substantial benefits in several domains. There are opportunities for delivering bundled services, including home visits from other professionals, behavioral health interventions or screenings, and nutrition interventions (Angelelli et al., 2022). These programs should consider expanding their services and making them more approachable and responsive to middle-aged and Black/African Americans with LTSS needs according to this study's findings. Moreover, a lack of disability-inclusive response and emergency preparedness and pre-pandemic disparities created structural disadvantages, exacerbated during the pandemic. Both structural disparities and their pandemic ramifications require the development and implementation of disability-inclusive public health and policy measures (Jesus et al., 2021).

Limitations and Future Directions

This study cannot address causal inference because it used a cross-sectional dataset to examine the proposed mediation and moderation associations. Pearlin et al. (2005) noted that it is best to use a life-course framework to understand stress proliferation; however, this framework can also make it challenging to establish the exact temporal sequence of stressors. There may also exist reverse associations, such as depressive symptoms causing changes in financial strain (Mendes De Leon et al., 1994), which are beyond the scope of this study. Moreover, the study findings show differences across age groups regarding financial strain and subjective health and well-being of people with LTSS needs. Further studies need to incorporate other theories related

to the life-course perspective when discussing similarities and differences between young adults aging with disabilities and older adults aging into disabilities. Studies about providing interventions to young adults with disabilities are necessary to improve their financial and health well-being in the long run.

Since the general CHIS survey does not include participants living in institutions (e.g., people in nursing homes), this study cannot generalize to older adults and people with disabilities living in institutions, which deserves further study. However, older adults and people with disabilities in home settings experienced different challenges and setbacks during the pandemic, including isolation, lack of adequate hands-on care, and lack of access to basic resources (e.g., food, medicine, transportation). Though studies of long-term care have traditionally focused on institutional care in the nursing home, it is also important to look at the experiences of non-institutionalized people with LTSS needs, particularly because HCBS use has expanded over the last two decades (Shippee et al., 2020). The trend of using HCBS has been especially notable for people with intellectual and developmental disabilities and less so for older people and younger persons with physical disabilities (Thach & Wiener, 2018). This study measured COVID-19 pandemic-related acute stress using a proximate indicator about whether the data was collected before and after the first stay-at-home order in California. It assumed that everyone experienced stress resulting from the COVID-19 pandemic at the same level; however, people have been experiencing diverse stress resulting from the COVID-19 pandemic, such as losing a family member and experiencing complicated grief (Hatch & Dohrenwend, 2007). The variation and extent of acute stress resulting from the COVID-19 pandemic deserves further study, especially under the current long COVID-19 impact. Further studies may use other indicators to measure this kind of stress, such as behavioral observation and self-reports of the experience of stress and

its consequences (Angel et al., 2003). Given the limitation of using the SPSS PROCESS module for the Conditional Process Analyses, this study's multivariate analyses were unweighted, and therefore different from the descriptive analyses which used population weights in California. In addition, while the measure of race/ethnicity includes participants who are American Indian/Alaska Native Only (Non-Latinx) or those with two or more races, this study cannot distinguish these two groups due to the small sample size of them. Further studies are required to examine LTSS issues of American Indian/Alaska Native Only (Non-Latinx) or people with two or more races specifically. Other social locations (i.e., gender, marital status, education, and employment) deserve further study related to the issues of financial strain and subjective health and well-being for people with LTSS needs.

Moreover, both quantitative and qualitative studies are needed to understand people's experiences "at the intersection" and determine if the barriers they face are multiplied because of their unique status (Goode et al., 2014). Therefore, the qualitative part of the CA-LTSS study can help understand and document the "lived experiences" of people who have LTSS needs, especially those who are not well-represented in the survey (e.g., LGBTQ, people living in rural areas, immigrants) to optimize their physical and mental health and well-being. The interviews of the CA-LTSS have been collected since January 2023. Though the qualitative research is beyond the scope of the current study, the interviews collected so far can explain the study's findings to some extent. For example, one Korean caregiver mentioned that her mother, a first-generation Korean immigrant in the U.S., had depression and other mental health issues. However, her mother avoided using mental health support because her generation felt ashamed of seeking mental health services, which is taboo in Asian cultures. It may explain the finding in this study that Asian adults with LTSS needs had more serious psychological distress than other

racial/ethnic groups. Another participant with vision impairment mentioned that people with different disabilities should be treated differently, and the current LTSS support system did not address the disability disparities well. It corresponds to the study's findings that people with different types of disabilities may experience multiple financial difficulties and subjective health and well-being. In addition, one young interviewee with LTSS needs mentioned her experience of being rejected when applying for public LTSS programs. The reason for not being qualified for these programs is related to her high education, which may indicate her capability of finding a nice job to afford the LTSS costs. However, the participant cannot work full-time due to her disability status. It demonstrates her unmet financial needs that the current LTSS system did not address well. Her experience may explain why young adults with disabilities encounter more financial difficulties due to a lack of support from public services and programs. All these examples show the benefits of using a mixed-method approach to explore LTSS-related issues. It will add the power and significance of examining these issues in future studies.

Conclusion

This study contributes to the literature and theory on disparities, disability status, financial strain, and health and well-being for people with LTSS needs, which may have practice and policy implications for social welfare, public policy, public health, and aging in the following respects. First, this study focused on people with LTSS needs by using the most recent and comprehensive population-level dataset in California. This study also simultaneously examined young, middle-aged, and older people with disabilities, all of whom have vital LTSS needs. The measure of financial strain addressed multiple issues such as housing, medical/healthcare, income, savings, and food expenses. This is a multidimensional measure of financial strain

seldom used in previous studies. The findings from these specific financial aspects may inform programs and policies prioritizing sectors with the most unmet needs, such as housing, food, and healthcare. Second, the study applied Pearlin's Stress Process Model to examine how stress resulting from financial strain and the COVID-19 pandemic proliferated the stress for people with different types of disabilities and their associations with subjective health and well-being. By using the Conditional Process Analysis, this study innovatively addressed chronic and acute stressors simultaneously by examining the moderator of the pandemic on the mediation association between disability status and health and well-being through financial strain. These empirical findings can expand Pearlin's Stress Process Model by locating and connecting chronic and acute stressors in the original theory. Third, this study also explored potential disparities of people's social locations in terms of age and race/ethnicity during this stress proliferation process. Young and middle-aged adults and racial/ethnic minorities with LTSS needs had more financial strain and worse subjective health and well-being than older adults and their white counterparts. This study brings an equity lens to the conversation and informs the process of making more inclusive programs and policies, especially for disadvantaged groups who need LTSS. The urgent and timely findings from this study can be used to promote the development and implementation of the Master Plan for Aging in California. They can also inform the efforts of other state and federal agencies to develop targeting and rebalancing policies and programs related to LTSS.

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