Health of the Adult Children Caregivers for Older Adults in Mainland China

Yujun Liu

Dissertation submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

Doctor of Philosophy
In
Human Development

Committee:
Karen A. Roberto (Chair)
Rosemary Blieszner
Tina (Jyoti) Savla
Megan Dolbin-MacNab

Defense Date: May 9th, 2017
Blacksburg, Virginia

Keywords: health, adult children caregiver, mainland China
Health of the Adult Children Caregivers for Older Adults in Mainland China

Yujun Liu

ABSTRACT

Objective. Guided by Pearlin’s stress process model, this study explored the health of the adult children caregivers for older adults in mainland China.

Methods. Data were from a nationally representative sample of respondents aged 45+ (N=13,204) who participated in the China Health and Retirement Longitudinal Study Wave 2 (2013). Using logistic regression techniques, the first analysis focused on the relationship between caregiver status and social determinants of health and health disparities. For the second analysis, the moderating effect of employment status on caregiving time and depressive symptoms among 1,082 adult children caregivers was examined using multiple linear regression.

Results. Adult children who were women, urban residents, younger, married, and had high school or more education were more likely to be caregivers than non-caregivers. Caregivers were more likely to live alone or live in three generation households and report fewer difficulties with physical functions compared to non-caregivers. Among caregivers, adult children who spent more hours providing care were more likely to experience more depressive symptoms as were adult children who were working outside of the home. The effect of caregiving time on depressive symptoms was moderated by employment status and gender. Unemployed men caregivers who spent more hours providing care reported the most depressive symptoms. Conversely, unemployed men caregivers who spent fewer hours providing care reported lowest level of depressive symptoms.
Discussion. This study provides some of the first information about the characteristics of a large representative sample of adult children caregivers in mainland China. Understanding the relationship between family caregiving and social determinants of health provides important information that can help inform policies and programs that support adult children caregivers. Study findings also lend support to the stress and coping model and suggest that both working status and gender buffer the effect of caregiving time on depressive symptoms among adult children caregivers. Spending more hours caring for older parents may pose burden on men caregivers who are working outside of home but not necessarily on women caregivers.
This study focused on the health of adult children who provide care for older parents in mainland China. I analyzed social influences on health of caregivers versus non-caregivers and whether health differed in the two groups. In addition, I explored how working or not working and time spent providing care affected feelings of depression among adult child caregivers.

Date for the study came from the China Health and Retirement Longitudinal Study Wave 2, collected in 2013. The 13,204 participants, aged 45 and older, represented all regions of China. Of these, 1,082 were providing care for a parent. First, I compared the personal characteristics of caregivers and non-caregivers to see if there were any differences between the two groups. Second, I examined the connection between the amount of time spent on caregiving and feelings of depression, and whether being employed or not made a difference in the time-depression connection.

The findings showed that adult children who were women, living in urban areas, younger, married, and had high school or more education were more likely to be caregivers than non-caregivers. Caregivers were more likely to live alone or live in three generation households. Caregivers were more likely to better physical functioning compared to non-caregivers. Those who spent more hours providing care reported more depressive symptoms, and so did caregivers who were working outside of the home. Unemployed men caregivers who spent more hours providing care reported the most
symptoms of depression. Unemployed men caregivers who spent fewer hours providing care reported the fewest depressive symptoms.

Understanding the social factors related to health and family caregiving can help policy makers establish programs to support older families in mainland China. In addition, the findings can help shape health-related programs and community services for adult children caregivers that will actually meet their needs.
Acknowledgement

I would like to express my sincere gratitude to my advisor Dr. Karen A. Roberto for her continuous support of my Ph.D. study and related research, for her patience, motivation, and immense knowledge. Her guidance helped me throughout the development of my research and writing of this dissertation. I have learned so much from her far beyond what I listed here, such as how to think from multiple perspectives, write papers, present results, give presentations, collaborate with others, and balance work and life outside work. I could not imagine having a better advisor and mentor for my Ph.D. study.

I would like to thank the rest of my committee for their assistance and insightful comments that encouraged me to widen my research from various perspectives. Dr. Tina Savla has given me tremendous guidance in data analysis. Dr. Rosemary Blieszner and Dr. Megan Dolbin-MacNab also provided me wonderful advice and support in planning the proposal, conducting analyses, and drafting the chapters. Without my committee’s advice, this dissertation would not have been possible.

In addition, I would like to thank my assistantship supervisors for their support, especially Ms. Mary Ellen Verdu, for her guidance in working with undergraduate students and her understanding, support, and encouragement as I passed through challenges in life while I was writing my dissertation.

I also thank my fellow Ph.D. students Sujee Kim, Raven Weaver, and Aaron Ogletree for the stimulating discussions, for the time we were working together before deadlines, and for all the fun we have had in the last four years. Also I thank my friends and collaborators for their friendship and support during the last four years. I thank Rong
I would like to thank my husband, Maoyuan Sun, my daughter Grace Sun, my family and my family-in-law. I thank Maoyuan for his love and care and always being there for me. I thank my daughter Grace for her sweet smile that can always take away my stress. I thank my parents for supporting me financially and spiritually. I thank my sister for taking care of mother when she was in the hospital and helping me look after Grace while I was writing this dissertation.

Most of all, I thank God for all his grace, leading me to a wonderful advisor, inspiring me with ideas, providing me with great family, friends, and collaborators, and bringing peace to my heart for everything. This dissertation results from all great gifts from God.
# TABLE OF CONTENT

**CHAPTER 1 INTRODUCTION**

- Global Aging and Family Caregiving
- Challenges for Adult Children Caregivers in China
  - Demographic Changes
  - Historical and Political Background of Demographic Change
  - Family Planning Policy (One-Child Policy)
  - Cultural and Political Background for Adult Children as Caregivers in China
  - Moral Responsibility for Family Care
  - Urbanization and Caregiving
  - Caregiving Challenges and Regional Differences
    - Regional Population Differences
    - Rural/Urban Differences
  - Social Determinants of Health and Health Disparities
- Purpose of Study and Research Questions

**CHAPTER 2 LITERATURE REVIEW**

- Theoretical Framework
- Influencing Factors of Family Caregivers’ Health
  - Cultural values
  - SES and Rural/Urban Differences
  - Gender Differences
  - Employment Status and Role Conflicts
  - Relationships between Adult Children Caregivers and Elder Parents
- Outcomes of Caregiving
  - Psychological Outcomes
  - Physical Health Outcomes
  - Social Outcomes
- Conclusions

**CHAPTER 3 METHODS**

- Design of the CHARLS Database
- Sampling and Data Collection Procedures
  - Sampling Procedures
  - Data Collection
  - Sampling Weights
- Data Preparation for Current Study
- Current Study Sample
CHAPTER 1: INTRODUCTION

Global Aging and Family Caregiving

The growth of the population aged 60 and older is a global phenomenon (United Nations, 2013; World Health Organization, 2015). By 2050, the world’s population aged 60 years and older is expected to be 2 billion, up from 900 million in 2015. In addition, the older population itself is aging. The oldest-old, individuals aged 80 and older, are the fastest growing segment of the older population (UN, 2013). Today, 125 million people are aged 80 years or older. By 2050, there will be almost 434 million people in this age group worldwide. Population aging has resulted in challenges in multiple social dimensions including politics, economics, and health care. To respond to this demographic change, many researchers from different disciplines have investigated ways to support the elderly population (Bloom & Canning, 2007).

When faced with illness and disability, families have long been recognized as the primary source of care of its older members (Marks, Lambert & Choi, 2002; Fuller-Iglesias, Webster, & Antonucci, 2015; Pezzin, Pollak, & Schone, 2013; Stuijbergen, Van Delden, Johannies, & Dykstra, 2008). According to the National Alliance for Caregiving (2015), approximately 16.6% of the population in the United States, or about 39.8 million adults, provide unpaid care to a recipient who is 50 or older. More than three in ten households (31.2%) report that at least one person has served as an unpaid family caregiver. The amount of time caregivers spent providing care ranges from less than one hour a week to more than 40 hours per week (National Alliance for Caregiving, 2015). As in the U.S., families around the world are often looked upon to take care of their older relatives. In China, for example, adult children usually are expected to provide care for
Challenges for Adult Children Caregivers in China

Demographic Changes

China had the largest older population in the world. With 122 million people aged 65 and older, China has over one-fifth of the world’s older population and that population is growing rapidly. The number of older adults is projected to increase to 238.8 million by 2030 (Ortman, Velkoff, & Hogan, 2014). By 2050, the aging population in China is projected to be 348.8 million, which will be larger than the total population of the United States (Mui, 2010; Ortman et al., 2014; Sherraden, 2010).

According to the data from China’s past four censuses (i.e., 1982, 1990, 2000, 2010) there was a continued shrinking in family size, and a trend of simplification in family structure (Hu & Peng, 2015). In 1982, households of four to five persons were most prevalent (62.2%), while households of six and more persons accounted for 28% of all households (Yi & Wang, 2003). By 2000, large households were no longer typical; households of three persons were the most common type (30%) of household in China. By 2010, the number of one-to-three person households increased to 64.9 % while the number of four or more person households decreased to 35.1% (Hu & Peng, 2015).

The “4-2-1” paradigm represents the anticipated family structures in upcoming decades that consist of four grandparents, two adult children and one grandchild (Flaherty et al., 2007; Jiang & Sánchez-Barricarte, 2011; Yang et al., 2012; Yang & He, 2014). More elders are likely to need care while there will be fewer caregivers available in the family. China’s elderly support ratio (the number of prime-age adults from 25 to 64 years
of age divided by the number persons older than 64 years) is projected to fall from nearly 13 in 2000 to 2.1 by 2050 (Zhao, Hu, Smith, Strauss, & Yang, 2014). As the number of children per family decreases, adult children or daughters- or sons-in-law may not be available to support older parents or even grandparents as expected by traditional Chinese family support systems (Bianchi, 2014; Bouchard, 2014; Liu & Guo, 2008; Mui, 2010; Shen & Yeatts, 2013).

**Historical and Political Background of Demographic Change**

China was considered an economically and politically strong nation in the late 17th and the 18th centuries, but the Chinese empire declined in the last dynasty (the Qing Dynasty). With the expansion of the European colonial powers in Asia in the 19th and early 20th centuries, the Qing Dynasty came under severe military and political pressure, and was overthrown in 1911. After four decades of war, Japanese invasion, World War II, and civil war, the Communist Red Army led by Mao Zedong emerged and in 1949 established the People’s Republic of China (PRC) (Banister, Bloom & Rosenberg, 2010). For a time, the Chinese Communist Party mimicked Soviet socialist policies in economics, education, and social welfare, but after the Cultural Revolution (i.e., a socio-political movement from 1966 through 1976) the Chinese government reformed its economic policies and started to support the development of a free market. However, the political administration maintained its socialist style (Liu, 2013).

**Family planning policy (One-Child Policy).** After the foundation of PRC, the death rate decreased rapidly and China’s total population began to grow. In the 1970s, concerned about the difficulties of keeping the food supply growing at least as fast as the population was growing, the government instituted a forceful family planning program in
both urban and rural areas (Banister et al., 2010; Currier, 2008; Frenette, 2006; Hvistendahl, 2010; Nie & Wyman, 2005). The policy regulated that an urban couple can only have one child and a rural couple can have two children at most. Couples were financially penalized for having more children (Croll, Davin, & Kane, 1985; Li, Yi, & Zhang, 2011; Wei, Lu, & Hesketh, 2009). As a result of implementing this policy, the fertility level in China dropped in half in less than a decade (Ebenstein, 2011; Feng, Poston, & Wang, 2014; Greenhalgh, 2003; Li, 2013). Now four decades later, children constitute a much smaller portion of the population and comparatively smaller cohorts of working-age adults exists. The government estimated that in 2011, 190 million of the 15 to 30 year-old individuals in China were the only child in their family (National Bureau of Statistics of China, 2013).

Cultural and Political Background for Adult Children as Caregivers in China

China has had an advanced civilization for around three millennia (Banister et al., 2010; Mui, 2010). Grounded in Confucianism, the strong hierarchical patriarchal family structure has persisted for two and half millennia. Confucius (551-479 B. C.), who founded Confucianism, designated that a filial son should respect his parents in daily life. The son should make his parents happy while he provides support for them, take care of them in sickness and show great sorrow over their death (Ikels, 2004; Ng, Phillips, & Lee, 2002).

Filial piety is an especially important ethic in Confucianism, which is considered the fundamental system of social values and morality. It refers to the obligations of respecting, supporting, and taking care of older family members (Deutsch, 2006; Mjelde-Mossey, 2007; Tang, 2006), and is an elemental component of moral and value systems
in China. It is morally and socially perceived as a norm during the process of socialization (Ikels, 2004; Liu, 2013). In China, most people are raised to practice filial piety. Filial behavior is considered a key indicator of a mature and well-adjusted adult. In a community, a filial person is considered reliable, trustworthy, and honorable, while a non-filial person may lose these social credits; furthermore, the child who provides care for his parents is culturally and legally identified as having the right to inherit his parents’ property (Ikels, 2004; Liu, 2013; Yang & Victor, 2008).

Traditionally in China, a primary purpose of raising children is so that parents can depend on children for support in old age. Adult children are expected to assume the duties of providing care and support for their parents (Ikels, 2004; Liu & Guo, 2007; Tang, 2006; Yang et al., 2012; Zhang & Liu, 2007). In the research on filial piety, many researchers use “sense of reciprocity” to explain the filial relationship between children and their elderly parents (Hong & Liu, 2000; Wicclair, 2000). Individuals usually feel that they have the obligation to help those who have offered help to them. This sense of reciprocity can be used to explain the interaction between children and parents: children feel responsible for providing care and support for their parents because of their parents’ efforts to raise them. This concept responds to the fundamental assumptions of social exchange theory (Cook & Rice, 2003; Emerson, 1976), emphasizing the interaction of emotion and consciousness as well as instrumental exchange (Ikels, 2004). Most adult children caregivers do not calculate the exact amount of money or energy they should spend according to the exact costs to their parents of raising them. Instead, they take on caregiving responsibilities because of their appreciation for and emotional attachment to their parents (Liu, 2013; Yang et al., 2012).
In studies of Chinese adult children caring for their elderly parents, filial piety is considered as an important influence on care recipients’ preferences for who should provide their care (Lai, 2010; Liu, 2013), the motives driving children to provide care for their frail elderly parents (Tang, 2006), and the adult child caregivers’ perception of burden (Yu et al., 2015; Zhan, 2002). The value of filial piety usually influences the care recipients’ choice of which child to live with and who will be the primary caregiver. In China, especially in rural areas, a daughter usually moves to her husband’s community after they marry and is traditionally expected to assist her husband in caring for his parents. There is empirical evidence suggesting that rural elders usually have stronger preferences for living with sons than their urban cohorts (Lai, 2010; Liu, 2013). In addition, filial culture gives the oldest sons particular privileges, such as inheritance rights and leadership in an extended family, and expects that they will take primary responsibility for providing care for older parents (Liu, 2013; Watson, 2007).

Filial expectations also shape adult children’s motives to assume the caregiver role. Many adult-child caregivers expressed that their caring for their parents is a form of appreciation for their parents’ rearing them (Chen, 2009; Lai, 2010). Some adults also described their current caregiving behavior as a model for their own children to learn how to treat them when these caregivers become frail (Lai, 2010). In addition, filial piety also influences caregivers’ perception of burden and their psychological well-being. The basic hypothesis of these studies is that the higher the caregiver’s acceptance of filial obligations and values, the lower the subjective burden and the lower the strain they experience (Tang, 2006; Zhan, 2002).

**Moral responsibility for family care.** In China, the central role of the family in
caring for older adults also is reinforced as part of “moral” responsibilities in carrying on the traditional family aging support system (Banister, Bloom & Rosenberg, 2010; Li & Chen, 2011). For thousands of years, governments played important roles in popularizing filial piety (Ikels, 2004; Wu et al., 2010; Xie, Zhang, Peng, & Jiao, 2010). The governments developed various strategies to encourage people to perform this moral act. For example, in most Chinese feudal dynasties, elder parents had the right to accuse their children of non-filial behaviors (Chen & Liu, 2012; Wu et al., 2010). After 1949, when PRC was founded, the government regulated the duty of adult children to support their parents in the fundamental state law, the Constitution of the People’s Republic of China. In article 49, the Constitution states: “Parents have the duty to rear and educate their children who are minors, and children who have come of age have the duty to support and assist their parents” (The National People’s Congress of the People’s Republic of China, 2004, p. 16). The Law of the People’s Republic of China for the Protection of Rights and Interests of the Aged specified additional regulations about the family’s responsibility to support elders. The Family Law (1980) and the Law of the People’s Republic of China on Protection of the Rights and Interests of the Elderly (1996) stated that the roles of family care provided by spouses, adult children, and grandchildren to older adults were obligatory (Chen & Liu, 2012).

These laws respond to the cultural value of filial piety. Adult children are considered to be the primary support for elders and the caregivers for frail elders, which implies that the government does not assume the caring responsibilities for elders. Some researchers have argued that the Chinese government’s assumption that the family should
fulfill the caregiving responsibility may have led to the slow development of public social
services for older persons (Cheung, Kwan, & Ng, 2006).

**Urbanization and caregiving.** Family culture in China has also changed with
modernization and urbanization (Xu & Xia, 2014; Yang, et al., 2012). Beginning with its
economic reform in 1978, China has experienced a rapid modernization and economic
development. Economic development provided employment opportunities outside the
birthplace (Xu & Xia, 2014). The Hukou system, which is a household registration
system, was revised in 1985 to address the income gap between residents of urban and
rural areas. The emergence of “temporary residence permits” provided policy support for
rural farmers to migrate to cities (Chen, 2009; Chunyu, Liang, & Wu, 2013). Thus, many
adult children left their hometowns and migrated to different towns, provinces, or even
countries because of job opportunities. Geographic separation makes it harder for adult
children to provide daily or on-going care for their parents (Wan, Yu, & Kolanowski,
2008; Zhang, 2004). There was a significant rise of women participating in the labor
force in recent decades in mainland China (Yi & Chien, 2002). The increasing
involvement of women in the paid workforce reduced the ability of families to care for
their elders (Yi & Chien, 2002; Yu & Schomann, 2015).

Employed caregivers often experience more stress than unemployed caregivers
because they may lack sufficient time and energy to fulfill both caregiver and employee
roles (Young & Grundy, 2008). When work requirements conflict with caregiving tasks,
some caregivers make changes in their work life, especially if they cannot pay for outside
help (Feinberg & Choula, 2012). In a recent national survey in U.S., one in five (19
percent) retirees left the workforce earlier than planned because of having to care for a
family member (Hellman, Copeland, & Van Derhei, 2012). Employed family caregivers who performed five or more tasks were significantly more likely to report feeling stressed from juggling caregiving and other responsibilities; having no time to themselves; being depressed in the past 2 weeks and worrying that they would make a mistake (Reinhard, Levine & Samis, 2013).

**Caregiving Challenges and Regional Differences**

*Regional Population Differences.* The rate of population aging differs across the 34 province level regions in China. In 2006, more than 7% of the population was over the age of 65 in 21 provinces level regions (National Bureau of Statistics of China, 2013). In the eastern coastal areas where economic development is faster, the aging of the population is rapid compared to the economically underdeveloped regions in China. For example, the population in Shanghai, which is in the economically developed eastern coastal area, “aged” in the year 1979, while the proportion of aging population in Ningxia, which is relatively undeveloped western inland region, did not reach 10% until 2012 (National Bureau of Statistics of China, 2013).

*Rural/Urban Differences.* In addition to the regional differences, there is an imbalance in aging between urban and rural areas in China. In 2000, the older population in rural areas was 85.5 million, accounting for 66% of the total older population in China (National Bureau of Statistics of China, 2013). Rural/urban residence strongly influences the availability and accessibility of the economic and service resources for the adult-child caregivers who live in cities versus the countryside. Since 1949, the Chinese Government has made an effort to develop the economy, social welfare, and public facilities in urban areas. In the late 1970s, new economic reforms were instituted, reducing the role of
central planning in China’s economy and expanding the role of markets and private enterprise (Chen, 2009; Yi & Chien, 2002; Jones, Kelly, Ortega & Manos, 2012). China’s economy has been one of the fastest growing economies in the world nearly every year since 1978. The urbanization process in China is expanding dramatically, with 53% national region areas urbanized in 2012 compared to only 21% in 1982 (National Bureau of Statistics of China, 2013). Massive investment and supportive policies led to the rapid development of economy in urban areas (Yan, Gao & Lyon, 2014; Zhao, 2002).

There is a large gap between resources available to people in China’s urban areas and resources available in rural areas. For example, the economy is more developed, and social welfare and other public amenities such as education, sanitation, and community services are better funded in urban than in rural areas. Rural residents are faced with greater social and financial access barriers as well as health disparities compared to their urban counterparts (Cao, Guo, Yu, Chen, & McDonald, 2014; Chen & Feeley, 2014; He & Ye, 2014). Rural residents are more likely to be in poor health condition and to suffer from chronic conditions such as diabetes. Rural seniors are often disadvantaged in terms of having lower incomes, less education, a lack of adequate housing, less access to public transportation, and poorer access to social services (Bacsu et al., 2012; Beverly, et al., 2005; Reckrey, DeCherrie, Kelley, & Ornstein, 2013; Vinson, Huang, & Crowther, 2011; Zhao, 2002).

Geographically, the health providers in rural areas are widely dispersed. The unique challenges of service delivery within the rural context such as geography, lower socio-economic status, and widely dispersed populations have not been given enough attention by the government and the service industry. Given the limited availability of
resources, rural caregivers may experience more stress than their urban cohorts (Bacsu et al., 2012; Beverly et al., 2005; Zhao, 2002).

**Social Determinants of Health and Health Disparities**

Social determinants of health (SDOH) are demographic and economic factors that may have direct or indirect effects on health, such as the conditions in which people are born, grow, live, work, and age (Braveman, Egerter, & Williams, 2011; WHO, 2016). These circumstances are shaped by the distribution of power and resources at global, national, and local levels (Braveman et al., 2011; WHO, 2016). SDOH contribute to health disparities (WHO, 2016) -- health differences that are closely linked with economic, social, or environmental disadvantage – that undermine the quality and quantity of life for groups of individuals. Health disparities among family caregivers are evident worldwide (Braveman, 2014; Tsuno, & Homma, 2009). Numerous studies have explored the experiences and health disparities among family caregivers in western countries (Braveman, 2014; Haley, Roth, Howard, & Safford, 2010; Son, Erno, Shea, Femia, Zarit & Stephens, 2007; Savla et al., 2008). Collectively, study findings suggest that race/ethnicity, economic resources and other social determinants of health contribute to health disparities among family caregivers (Braveman et al., 2011; Braveman, 2014; Haley et al., 2010; Wang et al., 2013).

**Purpose of Study and Research Questions**

Research on family caregiving suggests that the care of older adults places multiple stressors on families, communities, and societies (Pearlin, Mullan, Semple, & Skaff, 1990; Aneshensel, Pearlin, Mullan, Zarit, & Whitlatch, 1995). Caregiving poses a range of physical, psychological, social, and financial stress for family caregivers.
particularly among at-risk populations (e.g., lower-educated, racial and ethnic minorities; Godwin et al., 2013; Yang et al., 2012). Caregiving is associated with declines in caregivers’ physical health and symptoms of poor mental health including anxiety, stress, and depression (Blieszner et al., 2007; Mackay & Pakenham, 2011; Mausbach et al., 2012; Savla et al., 2008).

While some researchers have reported on the experiences of Chinese family caregivers of older adults with special diseases such as dementia and other mental health issues (Huang, Sun, Yen & Fu, 2008; Kwok, Twinn, & Yan, 2007), stroke (Chow, Wong & Poon, 2007), and cancer (Liang, 2002), most of these studies were conducted not in mainland China but in Taiwan, Hong Kong, and other regions (Zeng et al., 2014). Because the one-child policy reduced the number of potential family caregivers for future elder cohorts in mainland China, many researchers are concerned about the strain on adult children without siblings to share caring responsibilities (Liang & Wu, 2014; Lin, Yin & Loubere, 2014; Wang et al., 2009).

As explained in Chapter 2 of this document, while the SDOH and health disparities among family caregivers have received increasing attention from public health and nonprofit agencies worldwide (Braveman, 2014), there is a lack of research that explore the SDOH, health disparities and family caregiving in China. The volume of research on Chinese caregivers in mainland China is small and most studies are descriptive. Little is known about the health of family caregivers in mainland China, especially the health of adult children caring for their older parents (Zeng et al., 2014). In addition, the few existing empirical studies of caregiver outcomes (e.g., stress) fail to
give explicit attention to theory guiding their work or take an atheoretical approach (Chappell, Dujela, & Smith, 2015; Wang, Miller, & Zhao, 2014).

The purpose of this investigation was to further understanding of the experience of family caregivers in mainland China. Applying Pearlin’s Caregiving Stress Process Model (Pearlin et al., 1990) to the study of adult child caregivers, this study focused on the health of adult children caregivers. Analysis 1 focused on the social determinants of health, health disparities, and family caregiving and addressed the following research questions:

Research question 1: What are the common characteristics of adult children caregivers in mainland China?

Research question 2: Do social determinants of health and health disparities differentiate family caregiving and non-caregivers in mainland China?

Analysis 2 examined working status as a moderator of the health of family caregivers in mainland China and addressed the following research question:

Research question 3: What is the potential moderating effect of working status on adult children caregiver’s physical and mental health?
CHAPTER 2 LITERATURE REVIEW

In this chapter, I review the literature on the context of caregiving, highlighting the experiences of adult children caregivers in China where empirical information is available. First, I described Pearlin’s stress and coping model, which served as the theoretical framework for the study. Next, I reviewed factors that influence caregivers’ experience including culture, social economic status, region, gender, working status, living arrangement, and care recipients’ need. In the final section of this chapter, I discussed physical, psychological, and social outcomes of caregiving.

**Theoretical Framework**

**Pearlin’s Stress and Coping Model**

![Diagram of Pearlin's Stress and Coping Model](image)

*Figure 1. Stress and Coping Model (Pearlin et al., 1990)*

Pearlin’s stress and coping model (Aneshensel et al., 1995; Pearlin et al., 1990) is a well-organized and evidence-informed conceptual framework used by many researchers in western countries, especially in the U.S., to examine how caregiving responsibilities influence caregivers’ physical, emotional, and social health (Haley et al., 2010; Son et al.,
DISSERTATION

2007; Whitlatch, Schur, Noelker, Ejaz & Looman, 2001). The model includes four domains: the background and context of stress, the stressors, the mediators of stress, and the outcomes of stress (see figure 1; Pearlin et al., 1990). Although researchers operationalize the model differently, the background and context of stress typically includes variables such as the caregivers’ socioeconomic status, caregiving history, family and social network composition, and availability of community services. Primary stressors consist of two components: objective indicators and subjective indicators of stress. Objective indicators of stress include variables such as care recipients’ cognitive status, problematic behaviors, and dependencies in activities of daily living. Subjective indicators of stress include caregivers’ perceptions of role overload and relational deprivation. Secondary stressors include role strains and intrapsychic strains. The term secondary does not imply that these stressors are less impacting or important than primary stressors. They are termed secondary because they are not related directly to the care recipient’s illness (Aneshensel et al., 1995). For example, role strains are often experienced in association with the caregiver role such as family or job conflicts, economic problems, and constriction of social life. Intrapsychic strains includes the caregivers’ assessment of their self-esteem and level of mastery, and situational losses such as a sense of self and role captivity (Pearlin et al., 1990).

Outcomes of stressors include caregiver burden, depression, poor physical health, and placement of care recipient in the nursing home (Pearlin et al., 1990). For example, Son and colleagues (2009) interviewed 234 primary caregivers of elderly relatives with dementia and examined the impact of two stressors, care receivers’ behavior problems (an objective stressor) and caregivers’ feelings of overload (a subjective stressor), on
three dimensions of caregiver health: poorer self-reported health, more negative health behaviors, and greater use of health care services. Higher levels of both objective and subjective stressors were associated with all three dimensions of caregiver health. The association between objective stressors and health was mediated by caregivers’ feelings of overload. Vitaliano and colleagues (2013) examined psychological distress among 1,228 female caregiving and non-caregiving twins. They found that caregiving was associated with distress as measured by mental health functioning, anxiety, perceived stress, and depression. Feelings of distress were predictive of caregivers’ psychosocial functioning. These and findings from an array of caregiving studies demonstrate caregivers’ vulnerability to the effects of stressors across various dimensions of health (Vitaliano, Strachan, Dansie, Goldberg, & Buchwald, 2013).

The second element of Pearlin’s model is coping. Coping refers to an individual’s thinking or action to deal with the situation that is causing hardships or challenges (Pearlin et al., 1990; Longacre, Ross, & Fang, 2014). Coping strategies can potentially mediate the stress process at multiple points. A coping strategy can be used to manage the situation that leads to stress and reduce the stress symptoms that stem from the situation (Pearlin et al., 1990). For instance, informal care has negative effects on caregivers’ health, and subjective burden is one of the negative effects of caregiving. Caregiver’s subjective burden is defined as a caregiver’s state, characterized by distress in several areas (caregiver’s health, psychological well-being, finances, social life and the relationship between caregiver and care recipient), resulting from the caregiving situation (Zarit et al. 2014). Subjective burden has been related to anxiety (Cooper, Balamurali, & Livingston, 2007), depression (Schulz & Beach, 1999, Sun, Lucas, Meng & Zhang,
and physical health (Glaser & Kiecolt-Glaser, 2005). Thus, reducing or eliminating subjective burden can be viewed as preventive actions to decrease negative health effects. Coping strategy can be the identification of factors related to subjective burden. Del-Pino-Casado and colleagues’ (2011) systematic review of the effect of coping strategies on subjective burden in family caregivers of older adults found four coping categories related to subjective burden: problem-focused, emotion-focused, approach, and avoidance. The association between the first three types of coping strategies was not consistent. For example, Chou et al. (1999) found a positive association between problem-focused coping and subjective burden in Taiwanese home caregivers of older relatives with dementia, while Montoro-Rodriguez and Gallagher-Thompson (2009) showed a lack of association between problem-focused coping and subjective burden in female home caregivers of older relatives with dementia or cognitive impairment in U.S. However, a positive association was found between avoidance coping and subjective burden in family caregivers of older relatives with cognitive impairment (Semiatin & O’Connor, 2012).

Coping strategies used by caregivers influence caregiving outcomes (Quinn, Clare, McGuinness, & Woods, 2012). Zarit and colleagues (2011) examined exposure to and appraisal of care-related stressors associated with use of adult day services (ADS) by family caregivers of individuals with dementia. Participants were 121 family caregivers whose relative with dementia attended an ADS program. Daily assessments were obtained prior to the person’s attending ADS for the first time and after 1 and 2 months of attendance. Caregivers were assessed both on days their relatives attended and did not attend ADS. Total exposure to stressors and stress appraisals decreased significantly over
time on ADS days compared with non-ADS days. The findings suggested external factors may provide protection for caregivers against stress and strain resulting from the caregiving role.

**Influencing Factors of Family Caregivers’ Health**

Pearlin et al. (1990) suggested the importance of considering caregivers’ characteristics (e.g., socioeconomic status, roles, and interpersonal relationships) when exploring their caregiving experience (Pearlin et al., 1990). The status of adult children caregivers may influence their perception of difficulties and challenges in providing care for their elderly parents. For Chinese caregivers, their filial identity, socioeconomic status, role as parents or employees, and relationship with care recipients may influence their caregiving experience and, ultimately, their physical and mental health.

**Cultural Values**

Previous researchers reported cultural differences in caregiving outcomes such as burden, stress, and depression (Lai, 2010; Miyawaki, 2015). Two primary cultural value domains were identified in previous research about Asian caregivers of older adults in the United States and Canada: filial responsibility and familism (Miyawaki, 2015). Filial piety is a fundamental Confucian value common among many Asian cultures and historically teaches respect for parents, emphasizes on intergenerational relationships, and puts family over individual interests (Sung, 2001). Familism emphasizes “the family over the individual, showing respect for elders, and honoring the family name” (Schwartz, 2007, p. 102), and it is often contextualized within “family-centered cultural traditions and interpersonal impacts of providing care” (Scharlach et al., 2006, p. 139). It is different from a sense of filial responsibility, which is based on the individual, while
familism is a group or collectivist value. Familism as a cultural value promotes respect for elders within the family. Moreover, sharing of caregiving responsibility as a family unit may serve as a protective factor for caregivers’ mental health (Knight et al., 2002; Scharlach et al., 2006).

Filial piety and family responsibilities are embedded in Asian culture and have a strong impact on individual lives and parent-child relationships. The stronger the filial commitment of Canadian Chinese caregivers, the more positive caregiving experiences they reported (Lai, 2007, 2010). Identification with Asian cultural norms (e.g., filial piety) tended to lessen the level of caregiver burden. As caregiving tasks, role conflict, and role overload increased, the amount of caregiver burden increased. The belief in filial piety played an important role in lowering perceived levels of burden of caregiving (Lai, 2010). For instance, Chinese Canadian caregivers provided more financial assistance to their parents compared with Canadian counterparts (Chappell & Funk, 2011; Funk et al., 2011; Ho et al., 2003). Chinese American caregivers also expressed their conventional lifelong reciprocal obligation for parental care (Hsueh, Hu, & Clarke-Ekong, 2008). Lee and Bronstein (2010) indicated that filial sacrifice is likely the reason the Korean caregivers remain in their caregiving role. However, some researchers argue that filial piety regarding parental care does not completely buffer caregivers from stress and negative physical effects (Knight et al., 2002; Kobayashi & Funk, 2010). For example, Kim and Lee (2003) found that family caregiving for elderly relatives was stressful and negatively affected caregivers’ health outcomes regardless of societal values. Acculturated Asian caregivers reported higher burden or depression if they held stronger Asian cultural values. Thus, their caregiving style had been modified from family support
only to a family-community style, a combination of family and paid outside resources (Knight et al., 2002; Kobayashi & Funk, 2010; Young et al., 2002a).

Caregivers of Chinese descent born or living in other countries often have difficulty maintaining and practicing traditional cultural beliefs. Lan (2002) reported that traditional Chinese cultural norms of filial responsibility and parental authority were modified after families resettled in the U.S. Chinese American caregivers experienced a sense of being in transition because of adjustment to new roles and changes in their beliefs, values, and priorities from Asian to Western values (Jones et al., 2002). These challenges were exacerbated by an ongoing process of learning a new language, new social standards, and functioning in a new environment (Jones et al., 2003; Miyawaki, 2015).

In Asian countries, adult children are traditionally expected to sacrifice their physical, financial, and social needs for the benefits of their aging parents. Taking a family-centered approach to fulfill their filial responsibility (Chappell & Funk, 2011), they identified filial responsibility as a cultural value (Holland et al., 2010) and emphasized collectivity and Confucian ideals (Tang, 2006). As an important set of cultural values in China, filial piety and familism affect not only the caregiving arrangements but also the caregiving experiences in terms of stress and burden (Lai, 2010; Miyawaki, 2015). However, little research has been done to identify exactly how the cultural value of filial and family obligation affects adult children caregivers’ experience and health in mainland China (Lai, 2010).
SES and Rural/Urban Differences

Pearlin (1989) indicated that low status “may itself be a source of stressful life conditions” (Pearlin, 1989, p. 242). Indicators of social status include socioeconomic status (SES), marital status, educational, occupational, and economic attainments, race/ethnicity and rural/urban residency. Using data from the Behavioral Risk Factor Surveillance System, Do, Cohen, and Brown (2014) explored how the association between caregiving and health varied by sociodemographic factors. Using ordinal logistic regression with interaction terms and stratification by number of children, income, and race/ethnicity, they found that socioeconomic factors impacted the added burden of caregiving for both children and elderly relatives. The association between informal caregiving and impaired health varied by income, number of children in the family, and race/ethnicity. This association was significant among caregivers with one and two or more children, but not in those without children. Associations were strongest in mid-income group (those earning $50,000-$75,000 annually), but these income-dependent associations varied by race/ethnicity. In White caregivers with two or more children, the strongest associations between caregiving and poor health occurred for individuals with lower incomes. These trends were not observed for White caregivers without children or for other ethnic groups (Do, Cohen & Brown, 2014).

In mainland China, urban/rural residence strongly influences the availability and accessibility of the economic and service resources for adult-child caregivers. Since 1949, the Chinese government has made an effort to develop the economy, social welfare, and public facilities in urban areas. Officials believed that urban modernization and industrialization were the best ways to improve the economic strength of China, and
they invested most government funds to establish and support enterprises and relevant public services in cities (Guo, Aranda & Silverstein, 2009; Zhang & Zhou, 2013; Zhao, 2002). This strategy has resulted in a gap between resources available to people in urban areas and those available in rural areas. For example, the economy is more developed and social welfare and other public amenities such as education, sanitation, and community services, are better funded in urban than rural areas (Zhou et al., 2014; Zuo, Li, Mao, & Chi, 2014).

According to the national census, in 2010, on average an urban citizen’s income was 3.23 times higher than a rural citizen’s. The Engel’s Coefficient (an observation in economics stating that as income rises, the proportion of income spent on food falls, even if actual expenditure on food rises) in rural families (41.1%) is also higher than for urban families (35.7%; National Bureau of Statistics of China, 2011), indicating that the standard of living among rural residents is lower than that for urban individuals (Chai, 1992). Some researchers call the gap the “urban-rural dichotomy,” and consider it a significant indicator of social stratification in China (Liang & Guo, 2015; Liang & Lu, 2014; Sun et al., 2011; Zuo, Wu, & Li, 2011).

**Gender Differences**

Gender differences in the household division of labor often exist (Calasanti, 2006; Calasanti & King, 2007; Heaphy, 2007; Sokolovsky, 2009). The majority of caregivers for older adults are women. Women experience greater negative consequences of caregiving (Calasanti, 2004, 2010; Ron, 2009; Tang, 2006; Wolff & Kasper, 2006). Compared with male caregivers, female caregivers face higher levels of caregiving stress, have fewer social resources, and report lower levels of psychological and physical health
Haley and colleagues (2010) found that female caregivers on average provided more direct care and reported higher levels of burden and depression than their male counterparts. Mahoney, Regan, Katona, and Livingston (2005) found that high rates of anxiety as well as depressive symptoms in family caregivers, especially in female caregivers, were very common.

In China, the traditional Chinese household pattern is three-generational cohabitation. A daughter is considered given away after marriage to another family headed by her husband’s father (Liu, Han, Xiao, Li & Feldman, 2015; Tang, 2006). In contrast, having sons ensures more security for the future welfare of parents. Confucian ethics point to the responsibility of sons, especially eldest sons, to reside with and care for their aging parents; however, their wives, the daughters-in-law, perform the caregiving tasks because of filial piety. They have to abide by a traditional model of caregiving that is associated with the hierarchical concept of serving (Lan, 2002; Liu & Bern-Klug, 2016).

Although majority of care work is provided by women around the world, men also assume caregiving roles and responsibilities (Calasanti, 2010). Previous research in the U.S. indicated that men’s approaches to caregiving experiences and coping strategies are rooted in the sense of masculinity, which is defined as men’s ideal sense of selves (Calasanti & King, 2007; Calasanti & Kiecolt, 2012). Strategies that male caregivers tend to use include “exerting force, focusing on tasks, blocking emotions, minimizing disruption, distracting attention and self-medicating” (Calasanti & King, 2007, p. 516). Interventions and services for caregivers in different gender group are needed in the
coming years (Calasanti, 2007; Heaphy, 2007). Limited research has examined male adult children caregivers’ experience in China (Liu, 2013; Zeng, 2014).

**Employment Status and Role Conflicts**

Social institution is defined as

> “a complex of positions, roles, norms, and values lodged in particular types of social structures and organizing relatively stable patterns of human activity with respect to fundamental problems in producing life-sustaining resources, in reproducing individuals, and in sustaining viable societal structures within a given environment” (Turner, 1997 p. 6).

This definition emphasizes “a complex” of roles and norms in individuals’ lives. Social institution represents a broader concept than social stratification because social institutions not only classify statuses, but also regulate roles and shape an individual’s experience with certain conditions and expectations (Pearlin, 1999). A person usually plays different roles in different organizations in society and these roles are shaped by different norms and expectations. It is necessary to consider the complex of roles and norms in exploring individuals’ experience in addressing one particular type of problems in their lives. In addition to the caregiver role, caregivers also assume other significant roles, such as parenting their young children and working as employees or employers at workplaces. As stated earlier, filial culture is an essential part of the social values shaping Chinese adult children’s caregiver role and caregiving obligations. Therefore, the cultural effect of filial obligations is another important component of social institutions that should be considered in exploring caregivers’ experiences.
Caregivers’ obligations to elders may conflict with the responsibilities of caregivers’ other roles. A person usually does not play only one role in his or her daily life, but performs “a constellation of complementary roles” (Pearlin, 1989, p. 242). When these roles are in conflict or are problematic, they may contribute to stress. Novak and Guest (1989) used the term “developmental burden” to describe the conflicts between the caregiver role and other roles. Caregivers spend time, money, and emotion to care for their elders and consequently they may have fewer resources to perform their other roles, such as parents or employers/employees. Caregivers who attempt to balance caregiving with their other activities, such as work, family, and leisure, often experience more negative reactions, such as an increased sense of burden (Reinhard, Given, Petlick & Bemis, 2008; Robison, Fortinsky, Kleppinger, Shugrue, & Porter, 2009). Two types of role conflicts may appear in adult-child caregivers’ lives: one is the conflict between the caregiver role and the roles in their nuclear family, such as spouse and parent; the other is the conflict between the caregiver role and their roles in the workplace, such as employer or employee (Pearlin et al., 1990). Regardless of amount of care provided, caregivers may become increasingly distressed if they are unable to participate in valued activities and interests (Robison et al., 2009).

Adult children’s employment status (whether they are working outside of the family and whether they are working full time or part time) can affect their caregiving experiences. Previous research indicated that in the U.S. more than half of adult children who provide parent care were employed (Johnson & Weiner, 2006). Employed caregivers experienced more stress than unemployed caregivers because employed caregivers may
lack sufficient time and energy to fulfill both caregiver and employee roles (Young & Grundy, 2008; Reinhard et al., 2008).

Caregiving responsibilities can have a negative effect on work roles as caregivers adapt employment obligations to manage and meet care demands (Brough, Holt, Bauld, Biggs, & Ryan, 2008). Caregivers who are employed report missed days, interruptions at work, leaves of absence, and reduced productivity because of their caregiving obligations. They have difficulty maintaining work roles while assisting family members (Reinhard et al., 2008). Caregivers may choose to reduce hours or withdraw from paid employment to manage caregiving responsibilities. This may result in lower income, which reduces caregivers’ options for purchasing formal support (Brough et al., 2008; Yu & Schomann, 2015).

In China, the phenomenon of working beyond pension age has been observed in recent decades (Yu & Schomann, 2015). In addition, there is a considerable number of retirees re-entering the workforce (Zeng, 2011). As previously discussed, socio-economic transformation in China has had a profound impact on individual lives in the past three decades and some researchers have devoted some attention to paid work after retirement (Ling & Chi, 2008; Xiao et al., 2014; Yu & Schomann, 2015). Changing from a centrally planned economy to market economy brought both opportunities and risks for workers. The new market economy has provided opportunities for workers to work in various non-government sectors, for instance, self-employment. This sector re-emerged when market-oriented reforms were introduced in the late 1970s and has led to an increasing number of adults working beyond mandatory retirement age (Yu & Schomann, 2015). Findings from previous studies indicate that financial need of the workers themselves and support
for family members is a push factor that influences the decision to work after pension age (Lin & Chi, 2008). A study of Chinese caregivers found that unemployed caregivers experienced a higher level of caregiver’s depression, which the study author suggested could indicate that working outside family could be a way of obtaining relief from caregiving exhaustion for caregivers (Adamchak, 2001; Zhan, 2005).

**Relationships between Adult Children Caregivers and Elder Parents**

The relationship between family caregivers and care recipients influences the caregiving experience (Cong, & Sliverstein, 2012; Liu, Zeng, Li & Wang, 2013). The caregiver-care recipient relationship is affected by the psychological stresses (such as worry or burden) while providing care for the care recipients. Emotional well-being and other behavioral changes among family caregivers also affect the relationship (Sarkar, 2015; Thomas et al., 2006). Using the data collected from 100 older adults diagnosed with dementia who live at home with their principal caregivers, Thomas and colleagues (2006) explored parameters influencing caregivers’ quality of life, and its possible link with care recipients’ quality of life. Their findings indicated that caregivers’ and care recipients’ quality of life are interrelated and both share distress. Caregivers’ quality of life was correlated to the behavioral disorders, and the duration of dementia of the care recipients. Quinn, Clare, and Woods (2009) showed that caregiving had an impact on the quality of the relationship between family caregiver and care-recipient. Pre-caregiving and current relationship quality influenced the caregivers’ well-being. The care-recipient’s needs for help with activities of daily living (ADL) and level of behavioral problems also were found to influence the caregiver’s perceptions of relationship quality (Quinn et al. 2009).
The relationship between caregivers and care recipients also influences the way that caregivers perceive how caregiving responsibilities impact their lives (Chen & Silverstein, 2000; Antonucci, Jackson, & Biggs, 2007; Fried, Bradley, O’Leary, & Byers, 2005). However, there is no consensus about whether the quality of the caregiver-care recipient relationship has positive or negative influences on caregivers. Some researchers argue that caregivers may feel more burdened when they have positive and close relationship with their care recipients, perhaps because they have higher expectations for their caregiving performance (Tang, 2006). Conversely, Flannery (2002) found that caregivers who have poor relationship with the care recipient reported high levels of strain and depression.

Co-residence with the care recipient is an important spatial relationship that influences a caregiver’s perceived stress. Many U.S. studies indicated that co-residence decreases the opportunity of regular release from the caregiving involvement and thus it increases caregiver stress (Chappell, Dujela, & Smith, 2015; Hansen, Slagsvold & Ingebretsen, 2013). Being a co-residential caregiver is associated with increased mental health issues. Caregiving stress may arise both from the care needs of the care recipients and how the caregivers responds to these challenges (Hansen et al., 2013; Pinquart & Sorensen, 2007; Yu et al., 2012). The enduring stress associated with behavior problems of care recipients and the demands of caregiving may strain the caregiver’s ability to providing care for care recipients and maintain good self-care (Pinquart & Sorensen, 2007).
Outcomes of Caregiving

Psychological Outcomes

Caregiving is associated with symptoms of poor mental health such as anxiety, stress, and depression (Kim, Zarit, Femia & Savla, 2012; Mausbach et al., 2012; Mackay & Pakenham, 2011; Savla et al., 2008). In the U.S., it is estimated that between 40% and 70% of caregivers have clinically significant symptoms of depression with approximately one-quarter to one-half of these caregivers meeting the diagnostic criteria for major depression (Zarit, 2006). Many studies demonstrated a strong relationship between caregiver strain and depressive symptoms (Choi, Tirrito, & Mills, 2008; Robertson et al., 2007; Sarker, 2015; Savla et al., 2008; Zarit, 2006). Higher levels of depressive symptoms and mental health problems were reported among caregivers than among their non-caregiving peers (Marks, Lambert, & Choi, 2002; Pearlín et al., 1990; Sherwood, Given, Given, & Von Eye, 2005). Both caregiver depression and perceived burden have been found to increase as the care receiver’s functional status declines (Choi & Marks, 2008; Covinsky et al., 2003; Grunfeld, 2004).

Difficulties in caring for family members can also negatively impact caregivers’ life satisfaction (Dorfman, Holmes, & Berlin, 1996; Wilson-Genderson, Pruchno, & Cartwright, 2009). For example, Vitaliano et al. (2013) indicated that distress is a factor in predicting caregivers’ psychosocial functioning by examining psychological distress among 1,228 female caregiving and non-caregiving twins. Savla et al. (2008)’s study of the effects of routine assistance to parents on daily mood and other stressors found an association of providing assistance to older parents every day, depressive symptoms and psychological distress for adult children providing assistance. In addition, researchers
have found that leisure satisfaction had a significant positive impact on caregiver’s psychological well-being, and was an important factor for decreasing caregiver distress (Losada et al., 2010; Mausbach et al., 2012).

Yang and colleagues (2012) explored the health-related quality of life (HRQOL) among Chinese caregivers of the older adults living in the community and explore the predictors of caregivers’ HRQOL by interviews with 1,144 caregivers of older adults who suffered from one or more types of chronic diseases in 15 communities in 3 eastern cities of China. Results indicated that mental QOL of the caregivers of older adults was disrupted more seriously than physical QOL. Additionally, subjective caregiver burden might decrease caregiver’ health (Yang et al., 2012).

Since the 1990s, researchers have emphasized that although caregiving does have negative influences on caregivers, it can also bring positive effects, such as rewards and gratification. While caregiving strains are typically related to caregivers’ physical and mental wellbeing, rewards are more likely to affect caregivers’ emotions or the relationship with care recipients (Grant, Ramcharan, McGrath, Nolan, & Keady, 1998; Raschick & Ingersoll-Dayton, 2004). For many family caregivers, the strain of caregiving exists with rewards, such as personal growth, purpose in life, autonomy, environmental mastery, positive relations with others, and self-acceptance (Zhan, 2005). Positive aspects of caregiving are important as positive consequences, such as rewards and satisfaction, may buffer the negative effects of caregiving (Peacock et al., 2010; Raschick & Ingersoll-Dayton, 2004). In addition, mutuality and preparedness did reduce some of the strain on the caregiver (Peacock et al., 2010; Lee & Singh, 2010).

**Physical Health Outcomes**
Caregivers often are hidden patients themselves, with serious adverse physical and mental health consequences from their physically and emotionally demanding work as caregivers and reduced attention to their own health and health care (Reinhard et al., 2008). Declines in physical health and premature death among caregivers in general have been reported. Family caregivers experience significant negative physical consequences as their relative’s illness progresses (Reinhard et al., 2008; Reinhard, 2015). Schulz and Beach (1999) examined the relationship between caregiving demands among older spousal caregivers and 4-year all-cause mortality, controlling for sociodemographic factors, prevalent clinical disease, and subclinical disease at baseline by comparing the four-year mortality of 392 caregivers and 427 non-caregivers aged 66 to 96 years who were living with their spouses. Their results indicated that participants who were providing care and experiencing caregiver strain had mortality risks that were 63% higher than non-caregivers (Dunnion & Kelly, 2005; Schulz & Beach, 1999). Declines in caregiver health have been particularly associated with caregivers who perceive themselves as burdened (Schulz & Beach, 1999; Reinhard et al., 2008). Caregiver burden and strain have been related to the caregiver’s own poor health status, increased health-risk behaviors (such as smoking), and higher use of prescription drugs (Beach et al., 2000).

The physical strain of caregiving compounded by high rates of depressive symptoms and mental health problems puts many caregivers at serious risk for poor physical health outcomes. Researchers have reported that caregivers are at risk for fatigue and sleep disturbances (Jensen & Given, 1993; Given, Sherwood & Given, 2011; Roepke, et al., 2009), lower immune functioning (Glaser & Kiecolt-Glaser, 2005; Vitlic,
Lord, & Phillips, 2014), increased insulin levels and blood pressure (Cannuscio, Jones & Kawachi et al., 2002), and higher risks for cardiovascular disease (Buyck, et al., 2013; Haley, Roth, Howard, & Safford, 2010; Lee, Colditz, Berkman et al., 2003).

Caregivers have reported poorer physical health and higher use of medication than non-caregivers (del-Pino-Casado et al., 2011; Son et al., 2007; Reckrey et al., 2013). Caregivers also have been found to have lower levels of subjective well-being and physical health than non-caregivers (Pinquart & Sorensen, 2003). Ho and colleagues (2005) indicated that three-fifths of caregivers in their study reported fair or poor health status, one or more chronic conditions, or a disability, compared with one-third of non-caregivers. Caregivers also reported chronic conditions (including heart attack/heart disease, cancer, diabetes and arthritis) at nearly twice the rate of non-caregivers. Son et al. (2007) found that higher levels of caregiving stress were associated with poorer self-reported health, more negative health behaviors of caregivers, and greater use of health care services.

Previous researchers examined the relationships between provision of care by family members and their health behaviors and health maintenance (Burton, Zdaniuk, Schulz, Jackson, & Hirsch, 2003; McCurry, Gibbons, Logsdon, Vitiello, & Teri, 2005). When caregivers have heavy caregiving load, the odds of the caregivers experiencing sleep disturbance (McCurry et al., 2005; McCurry et al., 2009), not getting enough rest, and not having time to exercise (Cynthia, 2012) were high. In addition, caregivers were more likely to forget to take their prescriptions for their own chronic illnesses than non-caregivers (Burton et al., 1997; Reinhard et al., 2008). While providing care poses a threat to the overall health of caregivers, which can compromise their ability to continue
in their caregiver role (Reckrey, DeCherrie, Kelly & Orstein, 2013; Reinhard et al., 2008), limited empirical studies of the health effects of providing care for elderly parents in China were found (Tao et al., 2010).

**Social Outcomes**

Caregiving is associated with financial impacts including direct financial costs (Brodaty & Donkin, 2009), the financial consequences of decisions around caregiving (Kossek, Colquitt & Noe, 2001), and the constraints on choices arising from the financial status (Kutza, 2005; Moran et al., 2011). There are often significant and multiple costs arising from caregiving. Depending on the nature of the recipient’s disabilities, there may be increased heating costs, medical costs, transportation costs, and expensive house modifications. Cost estimates may omit or underestimate the substantial hidden unpaid costs associated with caregiving, which are substantial. Indirect costs include loss of earnings by care recipients and family caregivers as they relinquish or reduce employment and mortality burden (Brodaty & Donkin, 2009; Reinhard et al., 2008).

Family caregivers usually take on the caregiving role under sudden and extreme circumstances, with minimal preparation and little guidance and support from healthcare systems (Bartolo et al., 2010; Glajchen, 2004). They often lack social contact and support and experience feelings of social isolation because of a loss of social contact with others. This is concerning given that social support has been identified as protective against the stress of the caregiving role (Brodaty & Donkin, 2009; Fox & Max, 2009). Many caregivers report isolation from family members and friends (Poulin, Deng, Ingersoll, Witt, & Swain, 2012). Isolation from family members is especially problematic for caregivers who are geographically distant either from friends and family or from the care
recipient. It is quite common for family members within the United States to be dispersed among different geographic regions. In fact, nearly 7 million Americans are long-distant caregivers for older relatives (Family Caregiving Alliance, 2010).

In addition, caregivers tend to sacrifice their leisure pursuits and hobbies, to restrict time with friends and family, and to give up or reduce employment (Brodaty & Donkin, 2009; Serrano-Aguilar, Lopez-Bastida J, Yanes-Lopez, 2006). Caregivers who are more satisfied with their social interactions show fewer negative psychological symptoms (Ain et al., 2014; Bartolo et al., 2010; Brodaty & Donkin, 2009). Previous researchers indicated that psychosocial intervention could significantly increase the number of support persons for caregivers, their satisfaction with their support network, and the assistance they received with caregiving, compared with controls (Bartolo et al., 2010; Serrano-Aguilar et al., 2006).

**Conclusions**

The available literature indicates that caregiving pose a range of physical, psychological, social, and financial stress for family caregivers in particular (Godwin et al., 2013; Yang et al., 2012). Caregiving is associated with declines in caregivers’ physical health and symptoms of poor mental health such as anxiety, stress, and depression (Mausbach et al., 2012; Mackay & Pakenham, 2011; Savla et al., 2008). While it may be assumed that the effects of caregiving are universal, empirical evidence to support this assumption is lacking.

Although China has the largest and fastest growing population of old adults, the volume of research on Chinese caregivers in mainland China is small and most studies are descriptive. Little is known about the health of family caregivers in mainland China,
especially the health of adult children caring for their older parents (Chen, Hicks, & While, 2014; Chui, 2011; Zeng et al., 2014). In order to further understanding of the experience of family caregivers in mainland China and identify stressors that can be addressed as communities develop programs to support Chinese adult children caregivers, I examined how social demographic factors including age, gender, socioeconomic status, marital status, rural vs. urban residency, education level, and mental and physical health disparities are related to family caregiving in mainland China. In addition, I investigated how employment status influences Chinese adult children caregivers’ mental health and discussed the difference in the availability of community-based services for older adults between rural and urban communities.
CHAPTER 3 METHODS

The purpose of this study was to examine health outcomes for adult children in mainland China who provide care for their elderly parents. The data used in this study were collected for the China Health and Retirement Longitudinal Study (CHARLS). In this chapter, I present the overall study design, the sampling process, and the data collection procedures, and then explain the process of identifying the study sample and variables for this study. Finally, the analysis for addressing my research questions and hypotheses are presented. The Virginia Tech Institutional Review Board approved this study.

Design of the CHARLS Database

The CHARLS is a nationally representative and publicly available database that includes a wide range of individual and household information about middle-aged and elderly persons in mainland China (CHARLS, 2011). To facilitate inter-country comparisons, CHARLS was designed to be comparable with the Health and Retirement Study (HRS) and related aging surveys around the world (e.g., the English Longitudinal Survey of Aging, ELSA, and the Survey of Health, Aging and Retirement in Europe, SHARE), while being sensitive to the specific conditions of China. It is cosponsored by Peking University, the National Natural Science Foundation of China, the Behavioral and Social Research Division of the National Institute on Aging, and the World Bank.

Sampling and Data Collection Procedures

Information about the sampling and data collection procedures of the CHARLS database comes from the document Introduction to the Sample of 2011 Baseline Survey prepared by CHARLS research team. The baseline wave of CHARLS was collected in
DISSERTATION

2011 and included about 10,000 households—17,500 individuals 45 years and older, living in households in 28 provinces, 150 counties/districts, and 450 villages/communities. Elders living in nursing homes or other types of care facilities were not sampled, but Wave 1 respondents who later entered care facilities were followed. The same study procedures were used in 2013.

**Sampling procedures.** At the province level, individuals from 28 provinces were sampled. Four provinces lack data because the systematical screening methods automatically excluded provinces without enough population, including Tibet, Qinghai, Ningxia, and Hainan. On the neighborhood level, the sample used administrative villages (*cun*) in rural areas and community (*shequ*) in urban areas, as primary sampling units (PSUs). Three PSUs were selected within each province level unit, using PPS (probabilities proportional to size) sampling. The list of all PSUs was randomly sorted and selected for sampling.

In order to get an accurate sample frame of household in each village or community, a mapping software named CHARLS-GIS was developed. A sample of households were selected in each PSU from frames that were constructed based on maps prepared by mappers with the support of local informants. For each PSU, a mapper was first sent to the community with a GPS unit to identify boundaries, then the CHARLS office used the boundary information to capture Google Earth map images, which were used as the basis for the mapping and listing. All buildings in each PSU were enumerated with photos and GPS readings, and households within each building were listed. Buildings such as military bases, schools, dormitories, or nursing homes were excluded. Each PSU sampling frame was checked by the CHARLS headquarters to ensure that all
buildings within the community boundary were enumerated. After verification, the supervisors used CHARLS-GIS software to randomly sample 80 households, which were marked on the map and sent back to mappers in the field to collect information for these households including age of the oldest person, name of household head, telephone number, and the occupancy of the dwelling unit. The number of households sampled was greater than the targeted sample size of 24 households per PSU in anticipation of sampled households’ not having any members aged 45 or older, the possibility of an empty house, or household non-response.

**Data collection.** After final sampling work in the PSU was completed, a letter to potential respondents was sent to each selected household to inform them about the study. In each sampled household, a short screening form was used to identify whether the household had a member meeting the age eligibility requirements. Individuals 45 or older were selected as main respondents. If this person was married, his or her spouse was also interviewed. If an age-eligible person was too frail to answer questions, a proxy respondent was identified to help him or her to answer questions, usually a spouse or knowledgeable adult child in the household. All age-eligible sample households in each PSU who were found and willing to participate in the survey were interviewed by CHARLS research team members who were professionally trained for conducting face-to-face interviews. The response rate for the survey averaged 80%, with 94% participation in rural areas and 69% participation in urban areas.

Community level information was provided by the chosen village committees and neighborhood committees. The person in charge of each neighborhood committee (urban community) or village committee (rural community) completed a community
questionnaire. They were asked to provide statistical data about the village/community for areas such as the natural environment, employment, and financial status.

**Sample weights.** In the CHARLS database, sample weights for households and individuals were constructed directly from the sampling probabilities. Two sets of household weights are provided; one with and one without corrections for non-response. Individual weights are also provided, with and without individual non-response corrections. Because CHARLS data were created based on complex sample designs where sampling units (e.g., individuals) have different probabilities of being selected, weighting, clustering, and stratification of the survey design must be considered to obtain the correct standard error (Winship & Radbill, 1994). Similar to previous studies (Lei, Smith, Sun & Zhao, 2014; Zhao, Hu, Smith, Strauss, & Yang, 2014), sampling weights for individuals with corrections for non-response will be used in this study to obtain unbiased estimates.

**Data Preparation for Current Study**

As CHARLS is a large dataset that consists of a mixture of different variable types or data outliers, in preparation for conducting statistical analysis for the current study tests for outliers were run, and outliers were removed. Data collected in the absence of the selected participants (questions answered for older respondents by other people in the household) were also removed. A pragmatic missing data estimation approach, full information maximum likelihood (FIML) estimation using Stata 14 (Collins, Schafer, & Kam, 2001; Enders & Bandalos, 2001) was used to address missing data. FIML produces unbiased parameter estimates and standard errors under missing at random (MAR) and missing completely at random (MCAR). FIML requires that missing values to be at least
MAR. The process works by estimating a likelihood function for each individual based on the variables that are present so that all the available data are used (Collins, Schafer, & Kam, 2001). Test for skewness and kurtosis of all continuous variables also was run. Multivariate normality was checked and transformations was conducted for data that were not normally distributed.

**Current Study Sample**

The current study used data from CHARLS Wave 2, which were collected in 2013. For the first analysis of social determinants of health, health disparities and family caregiving, information from all participants in the 2013 CHARLS database were analyzed. A description of the total sample, broken down by gender, marital status, education, working status, and residence is provided in Table 1. The average age of the total sample was 56.8 years ($SD= 10.98$); about 60% ($n=8,467$) of the sample were 60 years and older. The total sample included an approximately equal number of men ($n=8,861, 47.70\%$) and women ($n=9,733, 52.30\%$). About 86% ($n= 16,136$) of the individuals in the sample were married or cohabiting; about 14% ($n=2,449$) of respondents were single (widowed, divorced, or never married). Approximately 22% of sample completed high school and above degree.

Among all adult children, more than half were women ($n= 3,854, 57.1\%$), about two thirds were married or cohabiting ($n=4,375, 64.8\%$), more than three-fourths ($n=5,102$) lived in the rural areas. The majority of the total sample had less than a high school education ($n= 4,048, 84.4\%$) and about 65% ($n=4,328$) were currently engaged in paid work. Among the adult children caregivers, a higher percentage were women ($n=679, 62.69\%$) and more likely to be married ($n=1,006, 92.89\%$) compared to adult
children non-caregivers. In addition, a higher percentage of adult children caregivers had a high school (n= 166, 16.70%) or college (n= 87, 7.99%) education compared to non-caregivers (n= 429, 10.7% high school; n= 93, 2.30% college). A higher percentage of adult children caregivers were currently working (n= 830, 76.6%) compared to adult children non-caregivers (n= 3,498, 61.7%).

The study sample for the second analysis, which focuses on work status and family caregiving, included adult children caregivers only (n = 1,082 see Table 1). The average age of the adult children caregivers was 53.4 years (SD= 6.905) and most caregivers were in their 40s (n= 429, 39.7%) or 50s (n=514, 46.2%). Approximately 60% (n=679) of the caregivers were women and 71% (n=703) lived in rural areas. Most of the caregivers were married or cohabiting (n=1,006, 92.89%). About 17% of the caregivers had a high school education and 8% had a college degree.

Measures

The CHARLS questionnaire includes 11 modules: demographics, family structure/transfer, health status and functioning, biomarkers, health care and insurance, work, retirement and pension, income and consumption, assets (individual and household), and community level information. Variables from each of these modules included in the current study are described below and shown in Table 2. Figure 2 depicts the heuristic model of Pearlin’s stress process model used in this study.
**Demographic characteristics.** Variables representing social determinants of health were participants’ age, gender, marital status, urban/rural residency, and education level. Gender was coded as a dummy variable with women coded as 1. Marital status was dichotomized as married or cohabiting (coded as 1) and divorced/separated, widowed or never married (coded as 0). Residency was categorized as urban (coded as 1) or rural (coded as 0). Education was also transformed as a dummy variable. Having high school diploma and higher was coded as 1; completion of less than high school was coded as 0.

**Caregiving status.** Participants who responded “Yes” to the question “Did you or your spouse take care of your parents or parents-in-law during the last year in assisting them in their daily activities or other activities (e.g., household chores, meal preparation, laundry, going out, grocery shopping, financial management)?” were coded as adult children caregivers who provide care for elder parents. Among all respondents in
CHARLS 2013 database, 1,082 participants answered “Yes”, representing 10% of the total sample population.

**Time spent on caregiving.** Participants were asked “approximately how many weeks and how many hours per week did you yourself spend last year taking care of your parents or parents-in-law?”. Overall, adult children caregivers spent an average of 19 weeks as caregivers, providing about an average of 20 hours per week of care for their parents or parents-in-laws. Summing all the hours adult children provided care for both parents and parents-in-laws, caregiving hours per year ranged from 0 to 8,528 hours (M = 474.76 hours; SD = 1087.779).

**Work status.** The question “Did you engage in agricultural work (including farming, forestry, fishing, and husbandry for your own family or others) for more than 10 days in the past year?” was asked to assess whether participants were engaged in agricultural work. A second question, “Did you work for at least one-hour last week?” was also asked of the participants who were not engaged in agricultural work. Any of the following activities were considered to be work: earn a wage, run your own business, and unpaid family business work. Participants who responded yes (coded as 1) to either of these two questions were identified as current workers (n=1,287, 7.43%).

**Living arrangement.** Living arrangement was categorized as living with spouse and people other than spouse, living with spouse only, or living alone. Among the participants, 9,596 (52.66%) lived with people other than spouse (coded as 2), 7,012 (38.4%) of the participants lived only with spouse (coded as 1), and 164 (8.93%) participants lived alone (coded as 0).
Physical functioning. Participants reported on their abilities to complete activities of daily living (ADL) and instrumental activities of daily living (IADL). ADL items included 6 areas: abilities in dressing, bathing or showering, eating, getting into or out of bed, using the toilet, and controlling urination/defecation. The five IADL items focused on completing household chores, preparing meals, shopping for groceries, managing money, and taking medications. For each item, respondents reported their difficulties on a 4-point scale extending from no difficulty (1) to absolutely cannot do it (4). Scores for ADLs ranged from 6 to 24 ($M = 6.77; SD=2.114$). About 50% ($n= 9,473$) of the participants reported no ADL limitations. The score for IADLs ranged from 6 to 24 ($M = 7.45; SD=3.294$). About 70% ($n= 13,029$) of the participants reported no IADL limitations.

Chronic disease. Participants were asked if they had been diagnosed by a doctor to have any of 14 chronic diseases: hypertension, dyslipidemia, diabetes or high blood sugar, cancer or malignant tumor, chronic lung diseases, liver disease, heart attack, stroke, kidney disease, stomach or other digestive disease, emotional, nervous, or psychiatric problems, memory-related disease, arthritis and asthma. The number of chronic diseases was summed up and ranged from 1 to 14. About 40% ($n= 7,190$) of the participants had no chronic disease, 27.3% ($n= 5,041$) of the participants had one chronic disease, and about 30% ($n= 6,224$) of the participants had two or more chronic diseases.

Depressive symptoms. Depressive symptom was assessed using the 10-item Center for Epidemiological Studies Depression Scale (CES-D-10; Björgvinsson et al., 2013; Radloff, 1977). The reliability of the CES-D-10 in terms of internal consistency was satisfactory with Cronbach alpha= 0.78-0.79. It has showed comparable accuracy to
the original CES-D in classifying cases with depressive symptoms among Chinese older adults (Kappa = 0.84, p < 0.01; Chin, Choi, Chan, & Wong, 2015). Participants reported their experiences during the week prior to interview, rating their feelings and experiences on a scale from 1 (rarely or none of the time; less than 1 day) to 4 (Most or all of the time; 5-7 days). Responses were summed and scored; higher values suggest depressive symptomology. Participants’ depressive symptoms scores ranged from 10 to 40, with a mean of 20.27 (SD=4.113). Participants with score equal to or above 20 were considered experiencing depressive symptoms. About 40% (n= 6,168) participants reported experiencing depressive symptoms.

**Life satisfaction.** Life satisfaction was assessed using a five-point Likert scale (1 = completely satisfied to 5 = not at all satisfied). Participants were asked “Please think about your life-as-a-whole. How satisfied are you with it? Are you completely satisfied, very satisfied, somewhat satisfied, not very satisfied, or not at all satisfied?” The life satisfaction score was reverse coded with 1 being not at all satisfied to 5 completely satisfied. The mean satisfaction score was 3.11 (SD = 0.749). Less than 20% (n= 2,325) of the participants were not very satisfied or not at all satisfied with life.

**Social economic status (SES).** Due to the lack of high quality data for annual income at the individual level (more than 80% of the participants did not report their annual income), community SES was used as a proxy estimate of participants’ SES. Social economic status of the communities was measured using a 1 to 7 Likert scale, with 1 being very poor and 7 very rich. As shown in Table1b, about 37% of respondents lived in poor and very poor communities whereas 33% of respondents lived in middle SES
communities and 11% of the respondents lived in communities identified as rich or very rich.

Analysis 1: Social determinants of health, health disparities and family caregiving

The purpose of the first analysis was to explore the relationship between being a family caregiver in mainland China and social determinants of health (age, gender, urban/rural residency, marital status, education, living arrangement), as well as mental and physical health disparities.

Research question 1: What are the common characteristics of adult children caregivers in mainland China?

Hypothesis 1: In mainland China, different aspects of social determinants of health will be related to family caregiving. Women, younger adults, living in rural areas, married, without college education are likely to be family caregivers.

Research question 2: Do social determinants of health and health disparities differentiate family caregiving and non-caregivers in mainland China?

Hypothesis 2: Health disparities will be evident between family caregivers and non-caregivers. Specifically, adult children caregivers are more likely to report poor physical health compared to adult children non-caregivers due to the caregiving burden and stress.

Hypothesis 3: Considering the strong impact of filial piety in mainland China, adult children caregivers will report less depressive symptoms and will be more satisfied with life compared to their non-caregiving counterparts.

Logistic regression was used to test hypotheses 1-3. It is a form of regression analysis that is used to predict an outcome variable (dependent variable) that is binary
using predictor variables (independent variables) that are continuous and/or categorical (Cohen, Cohen, West & Aiken, 2003). The outcome variable in this study caregiver status (caregiver vs. non-caregiver) and independent variables included both continuous variables (age, self-reported health status, depressive symptoms, and life satisfaction physical function [ADL/IADL]), and categorical variables (gender, urban/rural residency, marital status, education, living arrangement, number of chronic diseases).

Descriptive analysis was conducted using Stata 14. Univariate relations were tested with chi-square for categorical variables. Model 1 included demographic attributes shown in Table 1a.

\[
\text{Prob}(DCaregiving=1) = \phi
\]

\[
\log[\phi/(1 - \phi)] = \eta
\]

Model 1

\[
\eta = \beta_0 + \beta_1(Age) + \beta_2(DWomen) + \beta_3(DHighEducation) + \beta_4(DMarried) +
\]

\[
\beta_5(DRural)
\]

Building on this model, Model 2 added living arrangement and social economic status.

Model 2

\[
\eta = \beta_0 + \beta_1(Age) + \beta_2(DWomen) + \beta_3(DHighEducation) + \beta_4(DMarried) +
\]

\[
\beta_5(DRural) + \beta_6(RelativeIncome) + \beta_7(LivingAr)
\]

Model 3 added health measures to include all factors.

Model 3

\[
\eta = \beta_0 + \beta_1(Age) + \beta_2(DWomen) + \beta_3(DHighEducation) + \beta_4(DMarried) +
\]

\[
\beta_5(DRural) + \beta_6(RelativeIncome) + \beta_7(LivingAr) + \beta_8(Function) +
\]

\[
\beta_9(ChronicDisease) + \beta_{10}(Depression) + \beta_{11}(LifeSatisfaction)
\]
Analysis 2: Working status as a moderator of family caregivers’ health in China

The second analysis focused on employment status and health of adult children caregivers in mainland China. The following question were addressed:

Research question 3: What is the potential moderating effect of working status on adult children caregiver’s physical and mental health?

Hypothesis 4: Adult children who spend more hours per year caregiving will experience higher level of depressive symptoms, compared to their counterparts who spend less time on caregiving.

Hypothesis 5: Adult children caregivers’ employment status moderates the association between time spent on caregiving and depressive symptoms.

The main goal of this analysis was to explore whether Pearlin’s stress model is applicable to adult children providing care of elderly parents in mainland China. The dependent variables for this analysis were physical and mental health, which represent outcomes of caregiving based on Pearlin’s Stress Model (Pearlin et al., 1990). Physical health included daily functioning, measured by ability to conduct Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) and self-evaluated health. Measures of mental health included symptoms of depression and life satisfaction. Independent variables were demographic background (age, gender, marital status, rural/urban residency, education), time spent on caregiving (i.e., caregiving hours for father, mother, father in-law, and mother in-law; primary stressor), and working status (role conflict) and the product term, representing the interaction between working status and time spent on caregiving (secondary stressor).
The relationships among time spent caregiving, working status and health conditions were analyzed using multiple linear regression using Stata 14.2. Univariate comparisons of adult children caregivers by gender and working status were conducted using analysis of variance (ANOVA) for continuous variables and Chi Square test for categorical variables. Then the main effect among men and women caregivers was tested:

\[ Y_{\text{Depression}} = \beta_0 + \beta_1(Age) + \beta_2(DHighEducation) + \beta_3(DMarried) + \beta_4(DRural) + \beta_5(CaregivingTime) + \beta_6(Working) \]

Among both men and women caregivers, depressive symptoms were significantly related to caregiving time, therefore the main effects and three-way interactions were run. The main effect was tested:

\[ Y_{\text{Depression}} = \beta_0 + \beta_1(Age) + \beta_2(DWomen) + \beta_3(DHighEducation) + \beta_4(DMarried) + \beta_5(DRural) + \beta_6(CaregivingTime) + \beta_7(Work) \]

Then, the main effect and interaction effect were tested:

\[ Y_{\text{Depression}} = \beta_0 + \beta_1(Age) + \beta_2(DWomen) + \beta_3(DHighEducation) + \beta_4(DMarried) + \beta_5(DRural) + \beta_6(CaregivingTime) + \beta_7(Work) + \beta_8(Work*CaregivingTime) + \beta_9(Gender*CaregivingTime) + \beta_{10}(Work*CaregivingTime*Gender) \]
Chapter 4 RESULTS

In this chapter, the results of this study are presented in the form of two manuscripts. The first manuscript will be submitted to the *Journal of Aging & Health* and examines the relationship between caregiver status in mainland China and social determinants of health (SDH) and health disparities. This journal publishes manuscripts that address social and behavioral factors related to health and aging.

The second manuscript explores the potential moderating effect of employment status on caregiving time and depressive symptoms among adult children caregivers in mainland China. It will be submitted to *Aging and Society*, which is an interdisciplinary and international journal devoted to the understanding of human ageing and the circumstances of older people in their social and cultural contexts.
Title: Caregiving for Aging Parents in China: Social Determinants of Health and Health Disparities

Abstract

Objectives. This study explored the relationship between caregiver status in mainland China and social determinants of health (SDH) and health disparities.

Methods. Data from a nationally representative sample of respondents aged 45+ (N=13,204) who participated in the China Health and Retirement Longitudinal Study (Wave 2) were analyzed using logistic regression.

Results. Adult children who were women, urban residents, younger age, married, and high school educated and higher were more likely to be caregivers than non-caregivers. Caregivers were more likely to live alone or live in three generation households. Caregivers were more likely to report less difficulties with physical functions compared to non-caregivers.

Discussion. Understanding the relationship between family caregiving and SDH can help shape and inform policies and programs for older adults in need of care and help leverage opportunities to support adult children caregivers.
Introduction

When faced with illness or disability, families have long been recognized as the primary source of care of its older members (Fuller-Iglesias, Webster, & Antonucci, 2015; Pezzin, Pollak, & Schone, 2013). In China, which has over one-fifth of the world’s older population, providing care for aging parents is a strong cultural value (Liu, 2013). Adult children traditionally are expected to sacrifice their physical, financial, and social needs for the benefit of their aging parents (Holland et al., 2010; Yang, Hao, George & Wang, 2012).

Changes in the demographic characteristics of China’s families has resulted in fewer family caregivers available to support their older parents. China’s past four censuses (1982, 1990, 2000, 2010) showed a continual shrinking in family size, and a trend toward simplification in family structure (Hu & Peng, 2015). In 1982, households of four to five persons were most prevalent (62.2%) in China (Yi & Wang, 2003). By 2000, households of three persons were the most common household structure. By 2010, one-to-three person households in China increased to 64.9 % while four or more person households decreased to 35.1% (Hu & Peng, 2015).

The “4-2-1” paradigm, consisting of four grandparents, two adult children, and one grandchild, represents the anticipated family structure in China in upcoming decades (Jiang &Sánchez-Barricarte, 2011; Yang et al., 2012; Yang & He, 2014). China’s elder support ratio (number of adults aged 25-64 years/number persons older than 64 years) is projected to fall from nearly 13 in 2000 to 2.1 by 2050 (Zhao, Hu, Smith, Strauss, & Yang, 2014). As the number of children per family decreases, adult children or children-
in-law may not be available to support their older parents (Bianchi, 2014; Liu & Guo, 2008; Shen & Yeatts, 2013).

While some researchers have reported on the experiences of Chinese family caregivers of older adults with dementia and other mental health issues (Huang, Sun, Yen & Fu, 2008; Kwok, Twinn, & Yan, 2007), stroke (Chow, Wong & Poon, 2007), and cancer (Liang, 2002), most of these studies were conducted not in mainland China but in Taiwan, Hong Kong, and other regions in Asia (Zeng et al., 2014). As the number of potential family caregivers for future elder cohorts is reduced in mainland China, many researchers and practitioners are concerned about the strain on adult children without siblings to share caring responsibilities (Liang & Wu, 2014; Lin, Yin & Loubere, 2014; Wang et al., 2009). The purpose of the current study was to examine how mental and physical health disparities are related to family caregiving in mainland China.

Cultural Context

Filial piety refers to the obligations of respecting, supporting, and taking care of older family members (Mjelde-Mossey, 2007). It is a fundamental component of moral and value systems in China (Ikels, 2004; Liu, 2013). Filial behavior is considered a key indicator of a mature and well-adjusted adult. In China, most children are raised to practice filial piety. A filial person is considered reliable, trustworthy, and honorable. Furthermore, the child who provides care for parents is culturally and legally identified as having the right to inherit the parents’ property (Ikels, 2004; Liu, 2013; Yang & Victor, 2008).

Previous research on caregivers of Chinese descent born or living in other countries indicated that filial piety and family responsibilities are embedded in Chinese
culture and have a strong impact on individual lives and parent-child relationships (Lai, 2010; Miyawaki, 2015). Filial piety affects not only the caregiving arrangements but also the caregiving experiences. For instance, Lai (2010) indicated that the stronger the filial commitment of Canadian Chinese caregivers, the more positive caregiving experiences they reported. The belief in filial piety also played an important role in lowering perceived levels of caregiver burden among adult children (Lai, 2010; Miyawaki, 2015).

**Caregiving Outcomes**

The care of older adults places multiple stressors on families, communities, and societies (Aneshensel, Pearlin, Mullan, Zarit, & Whitlatch, 1995; Pearlin et al., 1990). Providing care poses a range of physical, psychological, social, and financial stressors for family caregivers particularly among at-risk populations (e.g., lower-educated individuals, racial and ethnic minorities; Godwin et al., 2013; Yang et al., 2012). Providing care threatens the overall health of family caregivers, which may compromise their ability to continue in their caregiver role. For example, family caregivers reported experiencing fatigue and sleep disturbances as their relative’s illness progresses (Reckrey, DeCherrie, Kelly & Orstein, 2013; Reinhard et al., 2008).

Caregivers for older adults also have reported poor mental health such as anxiety, stress, and depression (Kim, Zarit, Femia & Savla, 2012; Mausbach et al., 2012; Mackay & Pakenham, 2011; Savla et al., 2008). Compared to non-caregivers, caregivers reported higher levels of depressive symptoms and other mental health problems (Pearlin et al., 1990). In the U.S., it is estimated that between 40% and 70% of caregivers have clinically significant symptoms of depression with approximately one-quarter to one-half of these caregivers meeting the diagnostic criteria for major depression (Zarit, 2006). Many
studies have demonstrated a strong relationship between caregiver strain and depressive symptoms (Choi, Tirrito, & Mills, 2008; Robertson et al., 2007; Savla et al., 2008). Caregiver depression and perceived burden increased as the care receiver’s functional status declined (Choi & Marks, 2008; Grunfeld, 2004).

Financial strains associated with caregiving include direct financial costs of providing care (Brodaty & Donkin, 2009) and the financial consequences of care decisions (e.g., personal bankruptcy) (Kutza, 2005; Moran et al., 2011). Depending on the nature of the health conditions and needs of the care recipients, families may face increased house utilities costs, home modifications expenses, medical costs, and transportation costs. Cost estimates often omit or underestimate the substantial hidden unpaid costs associated with caregiving including loss of earnings by family members as they relinquish or reduce employment to provide care for their older relatives (Brodaty & Donkin, 2009; Reinhard et al., 2008).

Social determinants of health (SDH) and Health Disparities

Social determinants of health (SDH) are demographic and economic factors that may have direct or indirect effects on health, such as the conditions in which people are born, grow, live, work, and age (Braveman, Egerter, & Williams, 2011; WHO, 2016). These circumstances are shaped by the distribution of power and resources at global, national, and local levels (Braveman et al., 2011; WHO, 2016). In turn, SDH contribute to health disparities (WHO, 2016) – health differences that are closely linked with economic, social, or environmental disadvantage – that undermine the quality and quantity of life for groups of individuals.
Health disparities among family caregivers are evident worldwide (Braveman, 2014). Collectively, findings from studies that have explored health disparities among family caregivers in western countries suggest that race/ethnicity, economic resources, education, and marital status contributed to health disparities among family caregivers (Braveman et al., 2011; Braveman, 2014; Haley, Roth, Howard, & Safford, 2010; Wang et al., 2013). There is a lack of research that explores the relationship among SDH, health disparities, and family caregiving in mainland China. Although China has the largest and fastest growing older population, the volume of research on Chinese caregivers in mainland China is small and most studies are descriptive. Little is known about the health of family caregivers in mainland China, especially the health of adult children caring for their older parents (Chen, Hicks, & While, 2014; Chui, 2011; Zeng et al., 2014).

**Stress and Coping Framework**

The few existing empirical studies of caregiver outcomes (e.g., stress) among Chinese caregivers are atheoretical or fail to give explicit attention to theory guiding the research (Chappell, Dujela, & Smith, 2015; Wang, Miller, & Zhao, 2014). The current study is grounded in Pearlin’s stress and coping model (Aneshensel et al., 1995; Pearlin et al., 1990). This evidence-informed, conceptual framework is used by many researchers in western countries, especially in the U.S., to examine influences on caregivers’ physical, emotional, and social health (Haley et al., 2010; Son et al., 2007; Whitlatch, Schur, Noelker, Ejaz & Looman, 2001). The model includes four domains: the background and context of stress, the stressors, the mediators of stress, and the outcomes of stress. Caregivers’ characteristics (e.g., socioeconomic status, roles, and interpersonal
relationships) contribute to the caregiving experience (Pearlin et al., 1990) and influence their perception of the challenges in providing care for their elderly parents.

The current study focused on the health of adult children caregivers in mainland China. Figure 1 depicts the heuristic model of Pearlin’s stress process model used in this study. Variables from each of the stress domains included in the current study are described in the methods section and shown in Table 2. Three hypotheses were tested:

_Hypothesis 1: In mainland China, women, younger adults, living in rural areas, married, without college education are likely to be family caregivers._

_Hypothesis 2: Differences in health disparities will be evident between family caregivers and non-caregivers. Specifically, adult children caregivers will be more likely to report poor physical health compare to adult children non-caregivers related to the caregiving burden and stress._

_Hypothesis 3: Considering the strong impact of filial piety in mainland China, adult children caregivers will report less depressive symptoms and will be more satisfied with life compared to their non-caregiving counterparts._

**Methods**

Data came from the China Health and Retirement Longitudinal Study (CHARLS) Wave 2, which was collected in 2013. The baseline wave of CHARLS was collected in 2011 and included about 10,000 households—17,500 individuals in 28 provinces, 150 counties/districts, and 450 villages/communities. Four provinces, Tibet, Qinghai, Ningxia, and Hainan, were excluded because the systematical screening methods automatically excluded provinces with low populations. The CHARLS sample is composed of people 45 years and older, living in communities. Elders living in nursing
homes or other types of care facilities were not sampled, but Wave 1 respondents who later entered care facilities were followed. The same study procedures were used in 2013.

**Data collection.** On the neighborhood level, the sample used administrative villages (*cun*) in rural areas and community (*shequ*) in urban areas, as primary sampling units (PSUs). Three PSUs were selected within each province level unit, using probabilities proportional to size sampling procedures (see citation for detailed description of the study procedures). Individuals 45 or older were selected as main respondents. If this person was married, his or her spouse was also interviewed. If an age-eligible person was too frail to answer questions, a proxy respondent was identified to help him/her to answer questions, usually a spouse or knowledgeable adult child in the household. Individuals were interviewed by CHARLS research team members who were professionally trained for conducting face-to-face interviews.

**Sample weights.** In the CHARLS database, sample weights for households and individuals were constructed directly from the sampling probabilities. Because CHARLS data were created based on complex sample designs where sampling units have different probabilities of being selected, weighting, clustering, and stratifying of the survey design must be considered to obtain the correct standard error. Similar to previous studies (Lei, Smith, Sun & Zhao, 2014; Zhao, Hu, Smith, Strauss, & Yang, 2014), sampling weights for individuals with corrections for non-response were used in this study to obtain unbiased estimates.

**Current Study Sample**

To assess the relationship between social determinants of health, health disparities and family caregiving, information from all participants in the 2013 CHARLS database
was analyzed. Descriptive characteristics for the total sample are provided in Table 1. The average age of the total sample was 56.8 years ($SD= 10.981$) with about 60% ($n=8,467$) of the sample aged 60 years and older. It included an approximately equal number of men ($n=8,861, 47.70\%$) and women ($n=9,733, 52.30\%$). About 86% ($n= 16,136$) of the individuals in the sample were married or cohabiting. Approximately 17% of sample completed high school and 5% had a college degree.

**Measures**

**Demographic characteristics.** Variables representing social determinants of health included participants’ age, gender, marital status, urban/rural residency, and education level. Gender was coded as a dummy variable with women coded as 1. Marital status was dichotomized as married or cohabiting (coded as 1) and divorced/separated, widowed or never married (coded as 0). Residency was categorized as urban (coded as 1) or rural (coded as 0). Education was also transformed as a dummy variable. Having high school diploma and higher was coded as 1; completion of less than high school was coded as 0.

**Caregiving status.** Participants who responded “Yes” to the question “Did you or your spouse take care of your parents or parents-in-law during the last year in assisting them in their daily activities or other activities (e.g., household chores, meal preparation, laundry, going out, grocery shopping, financial management)?” were coded as adult children caregivers who provide care for elder parents (1). Among all respondents in CHARLS 2013 database, 1,083 participants answered “Yes”, representing 10% of the total sample population.
Living arrangement. Living arrangement was categorized as live alone (coded as 0), live in a two generation household (live with spouse or with parents or with children, coded as 1), live in a three generation household (live with spouse and parents and children, coded as 2), live with others (coded as 3). Among the adult children, 1,444 (21.4%) lived alone, 4,880 (72.3%) lived in a two generation household, 173 (2.6%) lived in a three generation household and 253 (3.7%) lived with others.

Relative income. The participants were asked: “compared to the average living standard of your neighbors or others in your village or neighborhood, how would you rate your standard of living? Responses were coded as worse (0), same (1) and better (2). Among the adult children, 3,219 (68.4%) reported worse, 1,303 (27.7%) reported same and 183 (3.9%) reported better.

Physical functioning. Participants reported on their abilities to complete activities of daily living (ADL) and instrumental activities of daily living (IADL). ADL items included 6 areas: abilities in dressing, bathing or showering, eating, getting into or out of bed, using the toilet, and controlling urination/defecation. The five IADL items focused on completing household chores, preparing meals, shopping for groceries, managing money, and taking medications. For each item, participants reported their difficulties on a 4-point scale extending from no difficulty (1) to absolutely cannot do it (4). Scores for ADLs ranged from 6 to 24 ($M = 6.77; SD=2.114$). About 50% ($n= 9,473$) of the participants reported no ADL limitations. The score for IADLs ranged from 6 to 24 ($M = 7.45; SD=3.294$). About 70% ($n= 13,029$) of the participants reported no IADL limitations.
**Chronic disease.** The participants were asked if they had been diagnosed by a doctor as having any of 14 chronic diseases: hypertension, dyslipidemia, diabetes or high blood sugar, cancer or malignant tumor, chronic lung diseases, liver disease, heart attack, stroke, kidney disease, stomach or other digestive disease, emotional, nervous, or psychiatric problems, memory-related disease, arthritis and asthma. The number of chronic diseases ranged from 1 to 14. About 40% ($n=7,190$) of the participants had no chronic disease (coded as 0), 27.3% ($n=5,041$) of the participants had one chronic disease (coded as 1), and about 30% ($n=6,224$) of the participants had two or more chronic diseases (coded as 2).

**Depressive symptoms.** Depressive symptoms were assessed using the 10-item Center for Epidemiological Studies Depression Scale (CES-D-10). The reliability (i.e., internal consistency) of the CES-D-10 was satisfactory, Cronbach alpha= 0.78-0.79. It has comparable accuracy to the original CES-D in classifying cases with depressive symptoms among Chinese older adults (Kappa = 0.84, p < 0.01; Chin, Choi, Chan, & Wong, 2015). Participants reported their experiences during the week prior to interview, rating their feelings and experiences on a scale from 1 (rarely or none of the time; less than 1 day) to 4 (Most or all of the time; 5-7 days). Responses were summed and scored; higher values suggest depressive symptomology. Depressive symptoms scores ranged from 10 to 40, with a mean of 20.27 ($SD=4.113$). Participants whose total score was equal to or above 20 were considered as having depressive symptoms. About 40% ($n=6,168$) participants reported experiencing depressive symptoms.

**Life satisfaction.** Life satisfaction was assessed using a five-point Likert scale (1 = completely satisfied to 5 = not at all satisfied). Participants were asked “Please think
about your life-as-a-whole. How satisfied are you with it? Are you completely satisfied, very satisfied, somewhat satisfied, not very satisfied, or not at all satisfied?” The life satisfaction score was reverse coded with 1 being not at all satisfied to 5 completely satisfied. The mean satisfaction score was 3.11 (SD = 0.749). Less than 20% (n= 2,325) of the participants were not very satisfied or not at all satisfied with life.

**Statistical Analysis**

In preparation for conducting the statistical analysis for the current study, tests for outliers were run, and outliers were removed. Data collected in the absence of the selected participants (questions answered for older respondents by other people in the household) were also removed. A pragmatic missing data estimation approach, full information maximum likelihood (FIML) estimation using Stata 14 (Collins, Schafer, & Kam, 2001; Enders & Bandalos, 2001 was used to address missing data. FIML has been shown to produce unbiased parameter estimates and standard errors under missing at random (MAR) and missing completely at random (MCAR). FIML requires that missing values to be at least MAR. The process estimates a likelihood function for each individual based on the variables that are present so that all the available data are used (Collins et al., 2001). Test for skewness and kurtosis of all continuous variables was run. Multivariate normality was checked and transformations was conducted when the data was not normally distributed.

Logistic regression with multiple dependent variables was used to reduce measurement errors introduced by single indicators. It is a form of regression analysis that is used to predict an outcome (dependent) variable that is binary using predictor (independent) variables that are continuous and/or categorical (Cohen, Cohen, West &
Aiken, 2003). The outcome variable in this study was caregiver status (caregiver vs. non-caregiver). Independent variables included both continuous variables (age, self-reported health status, depression symptoms, and life satisfaction physical function [ADL/IADL]), and categorical variables (gender, urban/rural residency, marital status, education, living arrangement, number of chronic diseases).

Descriptive analysis was conducted using Stata 14. Univariate relations were tested with chi-square for categorical variables. Model 1 included demographic attributes shown in Table 1a.

\[
\text{Prob}(DCaregiving=1) = \phi \\
\log[\phi/(1 - \phi)] = \eta
\]

Model 1

\[
\eta = \beta_0 + \beta_1*(Age) + \beta_2*(DWomen) + \beta_3*(DHighEducation) + \beta_4*(DMarried) + \beta_5*(DRural)
\]

Building on this model, Model 2 added living arrangement and social economic status.

Model 2

\[
\eta = \beta_0 + \beta_1*(Age) + \beta_2*(DWomen) + \beta_3*(DHighEducation) + \beta_4*(DMarried) + \beta_5*(DRural) + \beta_6*(RelativeIncome) + \beta_7*(LivingAr)
\]

Model 3 added health measures to include all factors.

Model 3

\[
\eta = \beta_0 + \beta_1*(Age) + \beta_2*(DWomen) + \beta_3*(DHighEducation) + \beta_4*(DMarried) + \beta_5*(DRural) + \beta_6*(RelativeIncome) + \beta_7*(LivingAr) + \beta_8*(Function) + \beta_9*(ChronicDisease) + \beta_{10}*(Depression) + \beta_{11}*(LifeSatisfaction)
\]

Results
Descriptive Characteristics of the Study Sample

Table 1 shows the descriptive characteristics of the study variables, both for the total sample of adult children and for adult children caregivers and non-caregivers. Among all adult children, more than half were women ($n=3,854, 57.1\%$), about two thirds were married or cohabiting ($n=4,375, 64.8\%$), more than three-fourths ($n=5,102$) lived in the rural areas. The majority of the total sample had less than a high school education ($n=4,048, 84.4\%$) and about 65% ($n=4,328$) were currently engaged in paid work. Among the adult children caregivers, a higher percentage were women ($n=679, 62.69\%$) and more likely to be married ($n=1,006, 92.89\%$) compared to adult children non-caregivers. In addition, a higher percentage of adult children caregivers had a high school ($n=166, 16.70\%$) or college ($n=87, 7.99\%$) education compared to non-caregivers ($n=429, 10.7\%$ high school; $n=93, 2.30\%$ college). A higher percentage of adult children caregivers were currently working ($n=830, 76.6\%$) compared to adult children non-caregivers ($n=3,498, 61.7\%$).

Social Determinants of Health and Family Caregivers

Table 2 shows the odds ratio of logistic regression of social determinants of health, health disparities, and caregiving among adult children. The results indicate that different aspects of SDH characterized family caregivers. Women (OR=1.91, $p<0.01$), married (OR=3.693, $p<0.01$), urban residents (OR=1.60, $p<0.01$), younger age (OR=0.93, $p<0.01$), high school educated and above (OR=1.60, $p<0.01$), were more likely to be caregivers compared to adult children non-caregivers. Caregivers were 2.38 times more likely to live alone (OR=2.38, $p<0.1$) and 4.16 times more likely to live with multiple generations (OR=4.16, $p<0.05$). In addition, adult children caregivers were 1.85
times more likely to report having a better social economic status (OR=1.85, p<0.05) compared to other people in their county.

**Health Disparities between Adult Children Caregivers and Non-caregivers**

Health disparities between adult child caregivers and non-caregivers were found (see Table 2). Adult child caregivers were 15% less likely to have difficulties with physical functions (OR=0.85, p<0.05) compared to their counterparts. However, no significant differences were found for associations of number of chronic diseases, depressive symptoms or life satisfaction and caregiver status between adult children caregivers and non-caregivers.

**Discussion**

For residents of mainland China, social determinants of health differentiated family caregivers and non-caregivers. Women, younger adults, living in urban areas, with high school education or above were more likely to be family caregivers than non-caregivers. Findings are consistent with previous studies on family caregiving in western countries where women are likely to assume the primary caregiver role (Ron, 2009; Wolff & Kasper, 2006). This may help explain the finding that caregivers were younger than non-caregivers, as it was common in mainland China for women to marry men who were older (Tucker & Van Hook, 2013). However, study findings might be contrary to traditional Chinese beliefs that having sons ensures more security for the future welfare of parents and it is the responsibility of sons, especially eldest sons, to reside with and provide care for their aging parents (Liu, 2013; Yang & Victor, 2008). In mainland China, especially in rural areas, a daughter usually moves to her husband’s community after they marry and is traditionally expected to assist her husband in caring for his
parents. As commonly found in studies of caregiving in U.S., Chinese women caregivers generally performed the caregiving tasks and provided more direct care than their men counterparts (Liu, 2013).

The hypothesis that adult children caregivers were more likely to report poor physical health compare to adult children non-caregivers was not supported. In addition, no significant difference was found for depressive symptoms between adult children caregivers and non-caregivers. The cultural value of filial and family obligation may have served as a buffering effect, limiting adult children caregivers’ stress and depressive symptoms. By providing care to their parents, the adult children caregivers in mainland China have achieved the sense of fulfilling their family obligations and their role as filial children (Lai, 2010). In addition, their behavior of providing care for their parents will be recognized and praised by their parents and other people in their social network as filial and commendable, which is a great encouragement for the adult children caregivers. Thus, receiving positive psychological affirmation and support may moderate or reduce depressive symptoms.

The findings that adult children caregivers in mainland China were less likely to report having difficulties with physical functions compared to adult children non-caregivers were not consistent with previous studies that reported poor physical health among caregivers (Sherwood & Given, 2011; Reinhard, 2015; Vitlic, Lord, & Phillips, 2014). Given Chinese cultural norms about family responsibilities (Liu, 2013), we speculate that the caregivers ignored their own chronic health problem when they devoted their time and energy to care for their aging parents.

Study Limitations
Data for this study came from a large national representative sample, which included participants with a wide range of age and educational levels. The findings added new evidence to the existing literature on Chinese caregivers (Lai, 2010) by revealing the characteristics of adult children caregivers in mainland China and the relationship between SDH, health disparities, and family caregiving. But like other studies using secondary database, there are limitations that need to be acknowledged. For example, findings of this study indicated that women were more likely to be caregivers, however, the family role of these women caregivers were not differentiated, so we cannot know whether the daughters or daughters-in-law provided care to aging parents. In addition, some variables suggested by Pearlin’s model were not included due to the lack of high quality information (e.g., family income, service use) in the dataset. In addition, work status was categorized as working or non-working; Future studies need to include information about various types of job position that the participants were engaged in order to assess the influence of workload and work-related stress on caregiving outcomes for persons in mainland China.

Conclusions and Implications

Findings of this study contribute to the understanding of the characteristics of family caregivers in mainland China and identified SDH that can be addressed as communities develop programs to support Chinese adult children caregivers. Study findings suggest that women caregivers living in rural areas are a vulnerable population in need of support. Taking into account the cultural context of caregiving, (e.g. filial and family obligation), the findings shed new light on factors that influence adult children’s experience as caregivers in mainland China.
Health Awareness Programs

Public health programs are needed to inform and educate adult children caregivers about health issues and empower them to seek needed personal health care and supportive services. Health awareness programs modeled after the successful *Heart Truth* campaign, the first U.S. government-sponsored campaign to increase awareness about heart disease in women (Hunting & Gleason, 2012), can serve as but one example of how to effectively raise awareness among adult children caregivers of their risk of health problems and motivated them to take actions to reduce their risk. Health awareness programs also mobilize community partnerships to identify and solve health problems and help develop policies and plans that support individual and community health.

Community Services for Rural Caregivers

More than 75% of the caregivers in this study lived in the rural areas, where the economy is less developed and social welfare and other public amenities such as education and sanitation are not easily accessed as in urban areas. Since 1949, the Chinese government has made an effort to develop the economy, social welfare, and public facilities in urban areas. Officials believed that urban modernization and industrialization were the best ways to improve the economic strength of China, and they invested most government funds to establish and support enterprises and relevant public services in cities (Guo, Aranda & Silverstein, 2009; Zhang & Zhou, 2013; Zhao, 2002; Zhou et al., 2014; Zuo, Li, Mao, & Chi, 2014). This strategy has resulted in a gap between resources available to people in resource rich urban areas and those available to people in rural areas. Thus, future research needs to identify the resource needs and challenges of family caregivers in mainland China to inform programs and policies to
support rural caregivers. The ultimate goal for communities needs to be achieving health equity for caregivers, which means striving for the highest possible standard of health for all people and giving special attention to the needs of those at greatest risk of poor health, based on social conditions (Braveman, 2014).

Need for Cultural Change

In studies of Chinese adult children caring for their elderly parents, filial piety is considered as an important influence on care recipients’ preferences for who should provide their care (Lai, 2010; Liu, 2013; (Miyawaki, 2015), the motives driving children to provide care for their frail elderly parents, and adult child caregivers’ perception of burden (Yu et al., 2015; Zhan, 2002). Rural elders usually have stronger preferences for living with sons than their urban cohorts. However, our analyses found that women living in rural areas were more likely to be caregivers for their elderly parents than were men. Filial culture bestows upon the oldest sons the responsibility for providing care for their parents (Zhan, 2002), but also gives them particular privileges, such as inheritance rights and leadership in an extended family. Daughters are considered given away after marriage to the family headed by her husband’s father. They do not have the right to inherit property even though they often spend years providing care for their own parents. Thus, cultural change is needed to support daughter caregivers and polices that protect women caregivers’ property rights (Law of the succession of People’s Republic of China, Chapter 2, Issue 9) need be reinforced, particularly in rural areas. Future research that examines the experiences and outcomes of adult children caregivers in mainland China need to include measures of filial piety to further understand this cultural perspective in a
changing society, which can help identify resources and barriers to support adult children caregivers.
References


Table 1

Demographic Characteristics of All Adult Children, Adult Children Caregivers and Non-caregivers, CHARLS Data, 2013

<table>
<thead>
<tr>
<th>Continuous Variable</th>
<th>All Adult Children (n=6750)</th>
<th>Adult Children Caregivers (n=1083)</th>
<th>Adult Children Non-Caregivers (n=5667)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>58.69 (11.365)</td>
<td>51.54 (6.035)</td>
<td>60.07 (11.634)</td>
</tr>
<tr>
<td>Categorical Variable</td>
<td>Number (%)</td>
<td>Number (%)</td>
<td>Number (%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2,895 (42.90)</td>
<td>403 (37.21)</td>
<td>2,492 (44.00)</td>
</tr>
<tr>
<td>Female</td>
<td>3,854 (57.10)</td>
<td>679 (62.69)</td>
<td>3,175 (56.00)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married or Cohabiting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single (widowed, divorced, never married)</td>
<td>2,374 (35.20)</td>
<td>77 (7.10)</td>
<td>2,297 (40.50)</td>
</tr>
<tr>
<td>Residence Location</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>1,628 (24.10)</td>
<td>378 (27.68)</td>
<td>1,250 (22.01)</td>
</tr>
<tr>
<td>Rural</td>
<td>5,102 (75.60)</td>
<td>703 (71.33)</td>
<td>4,399 (77.99)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education Level</td>
<td>Currently Working</td>
<td>Currently Not Working</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------</td>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>4,048 (84.40)</td>
<td>3,510 (87.00)</td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>598 (12.50)</td>
<td>429 (10.70)</td>
<td></td>
</tr>
<tr>
<td>College and above</td>
<td>151 (3.01)</td>
<td>93 (2.30)</td>
<td></td>
</tr>
<tr>
<td>Currently Working</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4,328 (64.10)</td>
<td>3,498 (61.70)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2,423 (35.90)</td>
<td>2,169 (38.30)</td>
<td></td>
</tr>
</tbody>
</table>
Table 2

*Odds Ratio of Logistic Regression of Social Determinants of Health, Health Disparities and Family Caregiving among Adult Children Caregivers in China. CHARLS Data, 2013*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic Attributes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.933***</td>
<td>0.924***</td>
<td>0.924***</td>
</tr>
<tr>
<td>Men(^a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>1.913***</td>
<td>1.725***</td>
<td>1.883*</td>
</tr>
<tr>
<td>Not married(^a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>3.693***</td>
<td>4.558***</td>
<td>5.393***</td>
</tr>
<tr>
<td>Less than high school(^a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school and above</td>
<td>1.598***</td>
<td>1.871***</td>
<td>2.456***</td>
</tr>
<tr>
<td>Community</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>1.898***</td>
<td>1.747***</td>
<td>1.602</td>
</tr>
<tr>
<td>Rural(^a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living Arrangement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live alone(^a)</td>
<td>2.055</td>
<td>2.778</td>
<td></td>
</tr>
<tr>
<td>Live only with spouse</td>
<td>1.738</td>
<td>1.774</td>
<td></td>
</tr>
<tr>
<td>Live with spouse and others</td>
<td>4.165**</td>
<td>6.795**</td>
<td></td>
</tr>
<tr>
<td>SES compared to county</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worse(^a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same</td>
<td>1.152</td>
<td>1.090</td>
<td></td>
</tr>
<tr>
<td>Better</td>
<td>1.856*</td>
<td>0.824</td>
<td></td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td></td>
<td></td>
<td>1.002</td>
</tr>
<tr>
<td>Life Satisfaction</td>
<td></td>
<td></td>
<td>1.586</td>
</tr>
<tr>
<td>Physical function</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADL</td>
<td></td>
<td></td>
<td>1.022</td>
</tr>
<tr>
<td>IADL</td>
<td></td>
<td></td>
<td>0.857**</td>
</tr>
<tr>
<td>Chronic Diseases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No chronic disease(^a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 chronic disease</td>
<td></td>
<td></td>
<td>0.969</td>
</tr>
<tr>
<td>2 or more chronic disease</td>
<td></td>
<td></td>
<td>1.208</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td>0.464</td>
</tr>
<tr>
<td>R(^2)</td>
<td>0.1669</td>
<td>0.1865</td>
<td>0.2301</td>
</tr>
<tr>
<td>Number of Cases</td>
<td>4,688</td>
<td>2,968</td>
<td>1,821</td>
</tr>
</tbody>
</table>

\(^a\) Designates reference category

*p<0.1, **p<0.05, ***p<0.01*
Figure 1. Conceptual framework and study variables (adapted from Pearlin et al., 1990)
Title: Employment Status of Adult Children in China: Effects on Caregiving Time and Depressive Symptoms

Abstract

Objective: Involvement in paid employment can affect family members’ experience as caregivers for older relatives. Guided by Pearlin’s stress process model, this study explored the moderating effect of employment status on caregiving time and depressive symptoms among adult children caregivers in mainland China.

Method: Participants were 660 adult children caregivers from a nationally representative sample of individuals aged 45+ (N=13,204) who participated in the China Health and Retirement Longitudinal Study (CHARLS) Wave 2 (2013). Multiple linear regression was used to analyze the direct effect of time spent in the caregiver role and the moderating effect of employment status on symptoms of depression among caregivers.

Results: Adult children caregivers who spent more hours providing care were more likely to experience higher levels of depressive symptoms as were caregivers who were working outside of the home. The effect of caregiving time on depressive symptoms was moderated by employment status and gender. Unemployed men caregivers who spent more hours providing care reported the highest levels of depressive symptoms. Conversely, unemployed men caregivers who spent fewer hours providing care reported lowest level of depressive symptoms.

Discussion: Findings of this study lend support to the stress and coping model and suggest that working status buffered the effect of caregiving time on depressive symptoms among adult children caregivers.
Keywords: Adult children, caregiving, depressive symptoms, employment, mainland China
Introduction

According to the National Alliance for Caregiving (2015), in 2014, approximately 16.6% of the population in the United States, or about 39.8 million adults, provide unpaid care to an individual aged 50 or older. Sixty percent of caregivers were their care recipient’s sole or primary unpaid caregiver. The amount of time caregivers spent providing care ranged from less than one hour a week to more than 40 hours per week. On average, caregivers spent 24.1 hours a week providing care, with 22% providing 41 or more hours of care each week. Sixty percent of caregivers reported being employed while proving care for family members (National Alliance for Caregiving, 2015). Yet, only 34% of caregivers used paid help to support their caregiving efforts (e.g., home care aides, housekeepers).

Often associated with the stress and strains of providing care are feelings of depression (Mausbach et al., 2012; Vitaliano et al., 2013). Mausbach and colleague (2012) examined the relationship between stress and depressive symptoms in a sample of 126 spouse caregivers of persons with Alzheimer’s disease. Spouses who reported greater stress had significantly more depressive symptoms. The researchers suggested multiple contributors to caregiver stress that may be associated with increased depressive symptoms including the type and intensity of behavior problems exhibited by care recipients and the number of different roles and responsibilities assumed by the caregiver (i.e., role overload).

As in the U.S., families around the world are often looked upon to take care of their older relatives. In China, adult children are expected to provide care for aging parents (Liu, 2013; Silverstein, Cong, & Li, 2006; Tang, 2006; Yang, Hao, George &
Wang, 2012). The central role of the family in caring for older adults is considered part of the “moral” responsibilities in the traditional Chinese society, especially in the rural areas (Banister, Bloom & Rosenberg, 2010; Li, 2006).

Regardless of their home country and cultural upbringing, caregivers may experience role conflict while trying to balance their responsibilities as primary caregivers, parents, and employees (Pavalko & Woodbury, 2000; Stephens, Townsend & Martire et al., 2001; Reinhard, Given, Petlick & Bemis, 2008). Adult children’s employment status – whether they work inside and outside of home and whether they work full time or part time – can affect their caregiving experiences. Employed caregivers generally experience higher levels of stress than unemployed caregivers because the former often lack sufficient time and energy to focus on their work responsibilities while keeping up with their caregiving tasks (Pavalko & Woodbury, 2000; Young & Grundy, 2008; Reinhard et al., 2008). Caregiving obligations often resulted in missed work days, interruptions at work, leaves of absence, reduced workplace productivity and in some situations, withdraw from paid employment to manage caregiving responsibilities (Bauer, 2015; Reinhard et al., 2008).

The volume of research on employment status and family caregiving in mainland China is relatively small and limited to descriptive qualitative (e.g., bivariate analyses) and qualitative investigations. For example, a qualitative study exploring depressive symptoms and subjective burdens among 110 family caregivers in mainland China found that unemployed caregivers experienced a greater intensity of depressive symptoms (Zhan, 2005). Liu and colleagues (2010) examined the labor market outcomes of caregiving for parents among married women in urban China. They found that employed
women experienced role conflicts as caregivers for aging parents and young children. Caring for parents negatively affected the caregivers’ probability of employment and hours of paid work. Women caregivers were less likely to be employed and were more likely to spend fewer hours in paid employment.

**Theoretical Framework and Hypotheses**

Research focused on family caregiving in mainland China has yet to look beyond the direct influence employment status has on adult-children caregivers’ physical and mental health (Zeng et al., 2014). To further understanding of the work-care relationship, the current study is grounded in Pearlin’s stress process model (Aneshensel et al., 1995; Pearlin et al., 1990), which is used by many researchers in Western countries to examine how providing care influences caregivers’ physical, emotional, and social health (Haley et al., 2010; Son et al., 2007). Pearlin’s model includes four domains: the background and context of stress, the stressors, the mediators of stress, and the outcomes of stress (Pearlin et al., 1990). Primary stressors consist of objective indicators of stress (e.g., dependencies in activities of daily living) as well as subjective indicators of stress (e.g., caregivers’ perception of role overload). Secondary stressors include role strains (e.g., family or job conflicts, economic problems, and constriction of social life) and intrapsychic strains (e.g., a sense of self and role captivity). These types of stressors are no less important than primary stressors, but are not related directly to the care recipient’s illness (Aneshensel et al., 1995). For example, role strains are often experienced in association with the caregiver role such as family or job conflicts, economic problems, and constriction of social life.
A caregiver usually does not play only one role in his or her daily life, but performs “a constellation of complementary roles” (Pearlin, 1989, p. 242). It is necessary to consider the complexity of roles and norms while exploring life challenges. Adult children caregivers may experience two types of role conflicts. One conflict may be between the caregiver role and family roles, such as being a spouse and a parent; the other conflict may occur between the caregiver role and employee role. Gordon and colleagues (2012) investigated the relationship between demands of providing elder care and working outside the home and role strain on a national sample of 583 family caregivers. Long working hours (i.e., work demands) were associated with higher caregiving burden. Specifically, work demands and work supports were associated with role strain experienced from both caregiving and work domains. Work demands were positively associated with the role conflicts of being caregiver and employee and caregiving burden. The study authors concluded that that role conflict (i.e., caregiver vs. employee) and role strain (i.e., caregiving demands in addition to work demands) were underlying contributors to the burden experienced by working caregivers. According to Pealin et al (1990), experiencing role conflict and strain may serve as a stressor that further contribute to health-related problems.

Guided by Pealin’s model, the main goal of this analysis was to explore the potential moderating effect of employment status on caregiving time and depressive symptoms among adult children caregivers in mainland China. The following hypothesis were addressed:
Hypothesis 1: Adult children who spend more hours per year caregiving will experience higher level of depressive symptoms, compared to their counterparts who spend less time on caregiving.

Hypothesis 2: Adult children caregivers’ employment status moderates the association between time spent on caregiving and depressive symptoms.

Methods

Data Source and Sample

The China Health and Retirement Longitudinal Study (CHARLS) is a nationally representative and publicly available micro-database that includes a wide range of individual and household information about mid-aged and older persons in mainland China. To facilitate inter-country comparisons, CHARLS was designed to be comparable with the Health and Retirement Study (HRS) and related aging surveys around the world, while being sensitive to the specific conditions of China. The CHARLS questionnaire includes eleven modules: demographics, family structure/transfer, health status and functioning, biomarkers, health care and insurance, work, retirement and pension, income and consumption, assets (individual and household), and community level information.

The current study used the second wave of CHARLS, which was collected in 2013 and included about 10,000 households — 17,500 individuals in 28 provinces, 150 counties/districts, and 450 villages/communities. The final sample is composed of people age 45 years and older, living in communities. Participants who responded “Yes” to the question “Did you or your spouse take care of your parents or parents-in-law during the last year in assisting them in their daily activities or other activities (e.g., household chores, meal preparation, laundry, going out, grocery shopping, financial management,
“...” were the focus of this study. Among the 10,090 respondents, 1,308 participants answered “Yes”, representing 13% of the total sample population.

**Measures**

The dependent variable for this analysis was depressive symptoms, which represented the outcome of caregiving (Pearlin et al., 1990). Independent variables included in the analyses were background variables (age, gender, marital status, rural/urban residency, education), time spent on caregiving (i.e., hours per year providing care for father, mother, father in-law, and mother in-law; primary stressor), and working status (role conflict). The product term represented the interaction between working status and time spent on caregiving (secondary stressor). The latter two variables also served as the moderating variables in the analytical models.

**Symptoms of depression.** Symptoms of depression were assessed using ten questions from the Center for Epidemiological Studies Depression Scale (CES-D). The reliability (i.e., internal consistency) of the CES-D-10 was satisfactory with Cronbach alpha= 0.78-0.79. It has showed comparable accuracy to the original CES-D in classifying persons with depressive symptoms among Chinese older adults (Kappa = 0.84, p < 0.01) (Chin et al., 2015). Participants reported their experiences during the week prior to interview, rating their feelings and experiences on a scale from 1 to 4. Responses were summed and scored, where higher values suggest higher levels of depression. Total depression score ranged from 10 to 40, with a mean score of 20.07 (SD=3.78).

**Demographic characteristics.** Demographic information about the participants included age (M=50.40, SD=3.74), gender (46.92% men; 53.08% women), marital status (91% married, 9% others), and residency (28% urban, 72% rural). Gender was coded as a
dummy variable with women coded as 1. Marital status was dichotomized with married or cohabiting coded as 1, whereas divorced/separated, widowed or never married coded as 0. Residency was categorized as urban residents (coded as 1) and rural residents (coded as 0).

**Working status.** The question “Did you engage in agricultural work (including farming, forestry, fishing, and husbandry for your own family or others) for more than 10 days in the past year?” was asked to assess whether participants were engaged in agricultural work. A second question asked, “Did you work for at least one-hour last week?” We consider any of the following activities to be work: earn a wage, run your own business, and unpaid family business work. Work did not include doing own housework or doing activities without pay, such as voluntary work. Participants who responded yes (coded as 1) to at least one of the two work status questions were identified as current workers (n=266, 20.22%).

**Time spent on caregiving.** Participants were asked “approximately how many weeks per year and how many hours per week did you spend last year taking care of your parents or parents-in-law?” Overall, adult children caregivers spent an average of 19 weeks as caregivers, providing about an average of 20 hours per week of care for their parents or parents-in-laws. Participants reported separately about caregiving time for mother, father, mother-in-law, and father-in-law. For this study, all the hours adult children provided for their parents or parents-in-laws were summed for a total caregiving time score. The number of caregiving hours per year ranged from 0 to 8,528 hours (M = 474.76 hours; SD= 1087.78). As the original variable was not normally distributed, this variable was log transformed with mean equal to 5.39 (SD= 1.73).
Analysis

Data Preparation. In preparation for conducting the statistical analysis for the current study, tests for outliers were run, and outliers were removed. Data collected in the absence of the selected participants were also removed (questions answered for older respondents by other people in the household). A pragmatic missing data estimation approach, full information maximum likelihood (FIML) estimation was used to address missing data using Stata 14 (Collins, Schafer, & Kam, 2001; Enders & Bandalos, 2001; Enders, 2006). Tests for skewness and kurtosis of all continuous variables were run. Multivariate normality was also checked and transformations were conducted if the data was not normally distributed.

Sample weights. In the CHARLS database, sample weights for households and individuals were constructed directly from the sampling probabilities. Two sets of household weights were provided; one with and one without corrections for non-response. Individual weights were also provided, with and without individual non-response corrections. Because CHARLS data were created based on complex sample designs where sampling units (e.g., individuals) have different probabilities of being selected, weighting, clustering, and stratification of the survey design must be considered to obtain the correct standard error (Winship & Radbill, 1994). Similar to previous studies (Lei, Smith, Sun & Zhao, 2014; Zhao, Hu, Smith, Strauss, & Yang, 2014), sampling weights for individuals with corrections for non-response were used in this study to obtain unbiased estimates.

The relationships among time on caregiving, working status and health conditions were analyzed using multiple linear regression using Stata 14.2. As shown in table 2,
univariate comparisons of adult children caregivers by gender and working status were conducted using analysis of variance (ANOVA) for continuous variables and Chi Square test for categorical variables. Then the main effect among men and women caregivers was tested:

\[ Y_{Depression} = \beta_0 + \beta_1*(Age) + \beta_2*(DHighEducation) + \beta_3*(DMarried) + \beta_4*(DRural) + \beta_5*(CaregivingTime) + \beta_6*(Working) \]

As shown in table 3, among both men and women caregivers, depressive symptoms were significantly related to caregiving time, therefore the main effects and three-way interactions were run. As shown in table 4, the main effect was tested:

\[ Y_{Depression} = \beta_0 + \beta_1*(Age) + \beta_2*(DWomen) + \beta_3*(DHighEducation) + \beta_4*(DMarried) + \beta_5*(DRural) + \beta_6*(CaregivingTime) + \beta_7*(Work) \]

As shown in table 5, the main effect and interaction effect were tested:

\[ Y_{Depression} = \beta_0 + \beta_1*(Age) + \beta_2*(DWomen) + \beta_3*(DHighEducation) + \beta_4*(DMarried) + \beta_5*(DRural) + \beta_6*(CaregivingTime) + \beta_7*(Work) + \beta_8*(Work*CaregivingTime) + \beta_9*(Gender*CaregivingTime) + \beta_{10}*(Work*CaregivingTime*Gender) \]

Results

Characteristics of the Study Sample

The descriptive characteristics of the adult children caregivers are provided in Table 1. More than 60% of the caregivers were women (n= 679, 62.69%) and the majority of the caregivers were married (n= 1,006, 92.89%). The average age of the caregivers was 50.4 years (SD= 3.75); most caregivers were in their 40s (39.70%) and 50s (46.20%). Only 16.70% percentage of caregivers had high school education (n= 166,
16.70%; about 8% of the caregivers had at least a college degree (n= 87, 7.99%). Most caregivers (77.76%) were working outside the home at the time they were interviewed (n= 830).

**Depressive Symptoms, Employment Status and Caregiving**

As shown in Table 2, women caregivers who were working were relatively younger (49.64, SD=5.21) compared to women caregivers who were not working (53.26, SD=6.48), men caregivers who were not working (56.49, SD=6.35) and men caregivers who were working (52.38, SD=5.83). In addition, Chi Square tests revealed significant difference in marital status, region, and education level among the four groups. Women caregivers who were not working were less likely to be married (n= 170, 87.18%) compared to women caregivers who were working (n=455, 94.01%), men caregivers who were not working (n=55, 94.83%) and men caregivers who were working (n=325, 94.20%). A higher percentage of women caregivers who were working were living in rural areas (n= 364, 75.36%) compared to women caregivers who were not working (n=80, 41.03%). Similarly, higher percentage of men caregivers who were working were living in rural areas (n= 239, 69.48%) compared to men caregivers who were not working (n=20, 34.48%). Women caregivers who were working were more likely to have education lower than high school (n= 278, 80.35%) compared to women caregivers who were not working (n=85, 58.62%), and men caregivers who were working were more likely to have education lower than high school (n= 160, 68.38%) compared to men caregivers who were not working (n=19, 43.18%).

The results of multivariate analyses showed that adult children caregivers’ mental health was associated with time spent on caregiving, working status, and background
characteristics. In the main effect model, caregivers whose education level was lower than high school were more likely to experience more depressive symptoms compared to caregivers who had high school degree ($B = -1.02, p < .05$). As shown in table 5, women caregivers were more likely to experience more depressive symptoms compared to men caregivers when controlling for other independent variables. Caregivers who spent more hours per year providing care were more likely to experience more depressive symptoms compared to caregivers who spent fewer hours per year providing care. Caregivers who were employed were more likely to experience more depressive symptoms than caregivers who were not employed.

There were significant two way interactions between working status and caregiving time, working status and gender, gender and caregiving time. Among caregivers who worked outside of home, the more hours they spent on providing care, the fewer the depressive symptoms reported ($B = -1.95, p < .05$). Given the same amount of caregiving time, adult caregivers who were working had lower depressive scores than their counterparts who were not working. Among women caregivers, the more time they spent on providing care, the fewer the depressive symptoms experienced ($B = -2.95, p = .00$). Given the same amount of time spent caregiving, women caregivers reported fewer depressive symptoms than men caregivers. Among all caregivers, women who were working outside of home reported fewer depressive symptoms than all the other groups ($B = -6.49, p = .02$).

The effect of caregiving time on depressive symptoms was moderated both by working status and gender, as indicated by the significant three-way interaction effect ($B = 2.334, p < .05$) in Table 5. As shown in Figure 1, unemployed men caregivers who
spent more hours providing care reported the most depressive symptoms. Conversely, employed men caregivers who spent more hours providing care the fewest depressive symptoms. Among both women and men caregivers, those who were currently working and spent more hours caring for their parents were less likely to experience depressive symptoms, indicating that working status served to buffer the relationship between time spent caregiving and depressive symptoms.

**Discussion**

The focus of this study was the interrelationship among working status, caregiving time, and level of depressive symptoms experienced by adult children caregivers of older adults in mainland China. Unemployed men caregivers who spent more time providing care reported more depressive symptoms whereas unemployed women caregivers who spent more time providing care reported fewer depressive symptoms. The findings contribute new evidence to the sparse existing literature on the effect of working on the mental health of adult children caregivers in mainland China.

**Gender Roles and Family Caregiving**

We found gender difference in the relationship between caregiving and depressive symptoms. Among unemployed caregivers, when less time was spent caregiving, women caregivers reported more depressive symptoms than men caregivers. This gendered distinction may be related to differences in attitude toward care work. Calastani (2010) found that because men caregivers tended to deal with care work as tasks they needed to do, they often feel a sense of accomplishment towards caregiving related work (Calasanti, 2010). Conversely, women caregivers tended to deal with care work with emotions and are more likely to grieve for the lost relationship due to caregiving (Calasanti, 2010). Although
we do not have data that would allow us to explore the gendered nuances of providing care, we speculate based on knowledge of common beliefs held by persons in mainland China about work (Zhan, 2005) and family (Liu et al., 2010; Zhan et al., 2008) that the gendered distinctions in care work may be just as applicable as in the United States.

Consistent with previous literature (Zhang, 2005), working outside of family appeared to provide caregivers with some relief from caregiving stress. Our findings showed that the buffering effect of working on the relationship between caregiving and depression symptoms varied by gender. When adult children caregivers spent longer hours providing care, women caregivers who were working reported fewer depressive symptoms than women caregivers who were not working. Men caregivers who were not working reported more depressive symptoms than men caregivers who were working. This difference can be at least partially explained by the different role expectations in working between men and women. Traditionally, in mainland China men are expected to work outside of home to provide financial support for the family (Xia et al., 2014); they will feel societal pressure if they have to be caregivers and do not work outside the home. In addition, men are expected to be “masculine” and hide their feelings and emotions such as fear, sadness and tenderness when others are present. The fact that men are less likely to seek support from others for their problems (Oliver, Pearson, Coe, & Gunnell, 2005) may help explain why unemployed men caregivers who spent more hours providing care experienced high levels of depressive symptoms.

Limitations and Implications for Future Research

The limitations of this study must be noted. First, the CHARLS is a large nationally representative and population-based study and the data is collected every other
year. Current study only analyzed the second wave which was collected in 2013. The cross-sectional dataset does not capture people who may have stopped caregiving for any reason, including physical or psychological decline of the adult children caregivers or the older parents’ changing needs. Only adult children who were providing care for their parents during the time of the survey were included in this study. Future researchers are encouraged to use multiple waves of CHARLS to conduct longitudinal analyses that includes previous and current family caregivers and explores changes in the mental health of these caregivers over time.

Second, caregivers in this study were self-identified based on the question “Did you or your spouse take care of your parents or parents-in-law during the last year in assisting them in their daily activities or other activities (e.g., household chores, meal preparation, laundry, going out, grocery shopping, financial management, etc.)?” This approach may exclude people who provide care but do not consider themselves as caregivers. In addition, the caregiving time was self-reported, which may be inaccurate due to the broad definition of caregiving. A more restrictive definition of caregiving, for example, performing certain tasks or providing daily care, may capture a subset of caregivers with different responsibilities and allow for a more specific examination of health outcomes in relationship to caregiving responsibilities (Robison et al., 2009). Using a more restrictive or specific definitions of caregiving may help clarify or refine the current study findings.

**Policy Implications**

Recognizing gender and work status differences in family caregiving is important when considering policies designed to support adult children caregivers. More than 60%
of the caregivers in this study were women. In addition, compared to men caregivers, when other independent variables were controlled, women caregivers were more likely to experience higher level of depressive symptoms. Among the current set of policies enacted by the Chinese government to promote family-work balance for women workers (e.g., the Labor Law and specially the Regulations Concerning the Labor Protection of Female Staff and Workers; Ministry of Commerce of the People’s Republic of China, 1988; Xia et al., 2014), policies supporting women workers who are also family caregivers were not found. With millions of women caregivers experiencing family and work stress, it is vital for policy makers to have a better understanding of factors that reduce and protect caregivers from the stress of role conflicts in their daily lives.

In this study, a higher percentage of both men and women caregivers who were working were living in rural areas compared to caregivers who were not working. In addition, adult children caregivers who were working were more likely to have education lower than high school compared to caregivers who were not working. This may help explain why adult children living in rural areas who were working were more likely to identify as caregivers than adult children living in urban areas. Perhaps because of the services and housing options for older adults available in urban areas, including home health care or assisted living facilities, the adult children did not need to be involved in the direct care of their parents. Conversely, in rural areas supportive services and housing are less available; thus rural adult children may have had no other option but to assume the care of their older parents.

In China, care-related policies favor home-based care (Feng et al., 2012). Yet, with the shrinking family size, growing aging population, and increasing full-time employment
among women, the number and availability of family members and friends who can provide daily home care is reduced. Currently, policies that supporting home or community-based care in mainland China have been largely limited to urban areas, and the number of older adults and their caregivers who can benefit from these services is still relatively small. In most areas of rural China, the development of home and community-based services faces many practical challenges because of the distance between places and limited resources (Feng, Liu, Guan, & Mor, 2012). Further research must be undertaken in mainland China to clarify adult children caregivers’ need for health and community services. Questions remain as to how caregivers gain access to various services, their expectations of health and community service agencies, and availability and quality of services offered in their communities. This type of information is necessary to inform government policies and program practices in their quest to support families providing elder care.

There is a growing phenomenon of working beyond pension age in China (Yu & Schomann, 2015). Financial needs and the financial support for family members may influence the adult children caregivers’ decision to work. Policies are needed to support adult children caregivers in the workforce. For instance, in Fujian province, a new legislation was passed on January 22, 2017 stating that those from one-child families will be able to take an additional 10 days of paid leave to take care of parents aged 60 years or more who are in the hospital. Such polices are a first step of supporting family caregivers and need to be implemented across the country.

It has been a cultural tradition and moral virtue in China that adult children take care of their aging parents. However, due to the rapid development of the society and economic discrepancies in different areas, many young people move to other places for
jobs, making it harder to provide routine care for their parents. A new policy passed in July 2013 requires adult children to visit their older parents at least once a year; otherwise, the parents can sue the children for neglect of duty (Elderly’s Rights Protection Law of the People's Republic of China, 2013). This policy emphasizes the responsibility of the younger generations in providing support for the older populations at the family level but could possibly lead to family tensions. As future policies are developed, it is important for policy makers to take into account other responsibilities of family caregivers, such as working and raising children, to support caregivers who are employed so that they are not forced to choose between providing care for aging parents and engaging in paid work. Caregivers who are working can make valuable contributions to the economic marketplace that need to be sustained. This will benefit not only caregivers themselves, but also their families.
References


Yan, B., Gao, X., & Lyon, M. (2014). Modeling satisfaction amongst the elderly in different Chinese urban neighborhoods. Social Science & Medicine, 118, 127-134. doi:10.1016/j.socscimed.2014.08.004


Table 1

Demographic Characteristics of All Adult Children and Adult Children Caregivers,

CHARLS Data, 2013

<table>
<thead>
<tr>
<th>Continuous Variable</th>
<th>All Adult Children (N=6,750)</th>
<th>Adult Children Caregivers (N=1,082)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean(SD)</td>
<td>Mean(SD)</td>
</tr>
<tr>
<td>Age</td>
<td>58.69 (11.37)</td>
<td>51.54(6.04)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Categorical Variable</th>
<th>Number (%)</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>2,895 (42.90)</td>
<td>403 (37.21)</td>
</tr>
<tr>
<td>Women</td>
<td>3,854 (57.10)</td>
<td>679 (62.69)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married or Cohabiting</td>
<td>4,375 (64.80)</td>
<td>1,006(92.89)</td>
</tr>
<tr>
<td>Single (widowed, divorced, never married)</td>
<td>2,374 (35.20)</td>
<td>77(7.10)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>1,628 (24.10)</td>
<td>378 (27.68)</td>
</tr>
<tr>
<td>Rural</td>
<td>5,102 (75.60)</td>
<td>703 (71.33)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>4,048 (84.40)</td>
<td>830 (75.31)</td>
</tr>
<tr>
<td>High school</td>
<td>598 (12.50)</td>
<td>166 (16.70)</td>
</tr>
<tr>
<td>College and above</td>
<td>151 (3.01)</td>
<td>87 (7.99)</td>
</tr>
<tr>
<td>Currently Working</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4,328 (64.10)</td>
<td>830 (76.60)</td>
</tr>
<tr>
<td>No</td>
<td>2,423 (35.90)</td>
<td>253 (23.40)</td>
</tr>
</tbody>
</table>
Table 2

*Univariate Comparisons of Adult Children Caregivers by Gender and Working Status,*

*CHARLS Data, 2013*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men-Working (n=345)</th>
<th>Men-Not Working (n=58)</th>
<th>Women-Working (n=484)</th>
<th>Women-Not Working (n=195)</th>
<th>F-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Continuous Variable</strong></td>
<td>Mean(SD)</td>
<td>Mean(SD)</td>
<td>Mean(SD)</td>
<td>Mean(SD)</td>
<td></td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>19.83 (3.61)</td>
<td>18.89 (3.45)</td>
<td>20.55 (4.14)</td>
<td>20.29 (3.90)</td>
<td>0.597 ns</td>
</tr>
<tr>
<td>Age</td>
<td>52.38 (5.83)</td>
<td>56.49 (6.35)</td>
<td>49.64 (5.21)</td>
<td>53.26 (6.48)</td>
<td>0.205 ns</td>
</tr>
<tr>
<td>Total Caregiving Time (Transformed)</td>
<td>2.52 (.80)</td>
<td>2.57 (.78)</td>
<td>2.36 (.846)</td>
<td>2.49 (.88)</td>
<td>0.291 ns</td>
</tr>
<tr>
<td><strong>Categorical Variable</strong></td>
<td>Number (%)</td>
<td>Number (%)</td>
<td>Number (%)</td>
<td>Number (%)</td>
<td>Chi²</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married or Cohabiting</td>
<td>325 (94.20)</td>
<td>55 (94.83)</td>
<td>455 (94.01)</td>
<td>170 (87.18)</td>
<td>11.76 ***</td>
</tr>
<tr>
<td>Single (widowed, divorced, never married)</td>
<td>20 (5.80)</td>
<td>3 (5.17)</td>
<td>29 (5.99)</td>
<td>25 (12.82)</td>
<td></td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>105 (30.52)</td>
<td>38 (65.52)</td>
<td>119 (24.64)</td>
<td>115 (58.97)</td>
<td>98.95 ***</td>
</tr>
<tr>
<td>Rural</td>
<td>239 (69.48)</td>
<td>20 (34.48)</td>
<td>364 (75.36)</td>
<td>80 (41.03)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>160 (68.38)</td>
<td>19 (43.18)</td>
<td>278 (80.35)</td>
<td>85 (58.62)</td>
<td>46.75 ***</td>
</tr>
<tr>
<td>High school</td>
<td>52 (22.22)</td>
<td>18 (40.91)</td>
<td>49 (14.16)</td>
<td>50 (34.48)</td>
<td></td>
</tr>
<tr>
<td>College and above</td>
<td>22 (9.40)</td>
<td>7 (15.91)</td>
<td>19 (5.49)</td>
<td>10 (6.90)</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.1, **p<0.05, ***p<0.01

ns: not significant
Table 3

Multiple Regression of Employment Status and Depressive Symptoms of Adult Children Caregivers in Mainland China, CHARLS Data, 2013

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th></th>
<th></th>
<th>Women</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE(B)</td>
<td>P-value</td>
<td>B</td>
<td>SE(B)</td>
<td>P-value</td>
</tr>
<tr>
<td>Age</td>
<td>-.02</td>
<td>.05</td>
<td>0.73</td>
<td>.03</td>
<td>.04</td>
<td>.51</td>
</tr>
<tr>
<td>Region</td>
<td>-.42</td>
<td>.81</td>
<td>0.61</td>
<td>.75</td>
<td>.52</td>
<td>.15</td>
</tr>
<tr>
<td>Education</td>
<td>-.37</td>
<td>.50</td>
<td>0.47</td>
<td>-.31</td>
<td>.32</td>
<td>.33</td>
</tr>
<tr>
<td>Marital</td>
<td>.37</td>
<td>1.08</td>
<td>0.73</td>
<td>-.56</td>
<td>.82</td>
<td>.49</td>
</tr>
<tr>
<td>Caregiving</td>
<td>.61</td>
<td>.31</td>
<td>0.05*</td>
<td>-.57</td>
<td>.22</td>
<td>.01**</td>
</tr>
<tr>
<td>Time</td>
<td>.94</td>
<td>.71</td>
<td>0.19</td>
<td>.24</td>
<td>.44</td>
<td>.59</td>
</tr>
<tr>
<td>Cons</td>
<td>18.25</td>
<td>2.99</td>
<td>0.00</td>
<td>20.03</td>
<td>2.64</td>
<td>.00</td>
</tr>
</tbody>
</table>

Men caregivers: R²= 0.0302; Number of Cases = 242; Population size = 7,588,075

Women caregivers: R²= 0.0513; Number of Cases = 419; Population size = 14,151,519

B regression coefficient

*p<0.1, **p<0.05, ***p<0.01
Table 4

Multiple Regression of Employment Status and Depressive Symptoms of Adult Children Caregivers in Mainland China, CHARLS Data, 2013, Main Effect

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE(B)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.02</td>
<td>.03</td>
<td>.46</td>
</tr>
<tr>
<td>Women (vs. Men)</td>
<td>.40</td>
<td>.34</td>
<td>.24</td>
</tr>
<tr>
<td>Rural (vs. Urban)</td>
<td>.20</td>
<td>.46</td>
<td>.66</td>
</tr>
<tr>
<td>High School (vs. &lt;HS)</td>
<td>-1.02</td>
<td>.44</td>
<td>.02**</td>
</tr>
<tr>
<td>College (vs. &lt;HS)</td>
<td>-.33</td>
<td>.59</td>
<td>.58</td>
</tr>
<tr>
<td>Married (vs. Single)</td>
<td>-.32</td>
<td>.65</td>
<td>.62</td>
</tr>
<tr>
<td>Caregiving Time</td>
<td>-.26</td>
<td>.19</td>
<td>.16</td>
</tr>
<tr>
<td>(Transformed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working (vs. Not Working)</td>
<td>.42</td>
<td>.39</td>
<td>.27</td>
</tr>
<tr>
<td>Constant</td>
<td>19.25</td>
<td>2.04</td>
<td>.00</td>
</tr>
</tbody>
</table>

$R^2 = 0.0316$

Number of Cases = 661 (Population size = 21,739,594)

B regression coefficient

*p<0.1, **p<0.05, ***p<0.01
Table 5

**Multiple Regression of Employment Status and Depressive Symptoms of Adult Children Caregivers in Mainland China, CHARLS Data, 2013, Main Effect and Interactions**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE(B)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.011</td>
<td>.03</td>
<td>.72</td>
</tr>
<tr>
<td>Women (vs. Men)</td>
<td>8.68</td>
<td>2.51</td>
<td>.00***</td>
</tr>
<tr>
<td>Rural (vs. Urban)</td>
<td>.19</td>
<td>.46</td>
<td>.67</td>
</tr>
<tr>
<td>High School (vs. &lt;HS)</td>
<td>- .96</td>
<td>.43</td>
<td>.03**</td>
</tr>
<tr>
<td>College (vs. &lt;HS)</td>
<td>-.44</td>
<td>.55</td>
<td>.42</td>
</tr>
<tr>
<td>Married (vs. Single)</td>
<td>-.28</td>
<td>.64</td>
<td>.66</td>
</tr>
<tr>
<td>Caregiving Time</td>
<td>2.22</td>
<td>.95</td>
<td>.02**</td>
</tr>
<tr>
<td>Working (vs. Not Working)</td>
<td>6.17</td>
<td>2.49</td>
<td>.01**</td>
</tr>
<tr>
<td>Work Status *Caregiving Time</td>
<td>-1.95</td>
<td>.99</td>
<td>.05*</td>
</tr>
<tr>
<td>Women*Caregiving Time</td>
<td>-2.95</td>
<td>.99</td>
<td>.00***</td>
</tr>
<tr>
<td>Women*Work Status</td>
<td>-6.49</td>
<td>2.75</td>
<td>.02**</td>
</tr>
<tr>
<td>Women*Work Status</td>
<td>2.18</td>
<td>1.08</td>
<td>.04**</td>
</tr>
<tr>
<td>Status*Caregiving Time</td>
<td>12.82</td>
<td>3.04</td>
<td>.00***</td>
</tr>
</tbody>
</table>

$R^2 = 0.0544$

Number of Cases = 661

Population size = 21,739,594

B regression coefficient

* $p<0.1$, ** $p<0.05$, *** $p<0.01$
Figure 1. The 3-way interaction effect between gender, employment status and caregiving time on depressive symptoms among adult children caregivers.
Chapter 5 CONCLUSIONS AND IMPLICATIONS

Applying Pearlin’s Caregiving Stress Process Model (Pearlin et al., 1990) to the study of caregiving in mainland China, this study examined predictors of physical and mental health among adult children providing care for their elderly parents. Using data from the China Health and Retirement Longitudinal Study (CHARLS) Wave 2, which was a nationally representative sample of individuals aged 45+ years collected in 2013, I explored the common characteristics of adult children caregivers in mainland China, the relationship between social determinants of health, health disparities, and family caregiving, and the effect of working status on the hours adult children spend providing care and depressive symptoms.

For residents of mainland China, social determinants of health differentiated between family caregivers and non-caregivers. Sample members who were women, younger adults, living in urban areas, with a high school education or above were more likely to be family caregivers than non-caregivers. Findings are consistent with previous studies on family caregiving in western countries, which reported that women were likely to assume the primary caregiver role (Ron, 2009; Wolff & Kasper, 2006). As commonly found in the U.S., Chinese women caregivers generally performed the caregiving tasks and provided more direct care than their men counterparts. However, study findings are contrary to traditional Chinese beliefs that having sons ensures more security for the future welfare of parents and it is the responsibility of sons, especially eldest sons, to reside with their aging parents and usually the daughters-in-law provide care for their husbands’ aging parents.
No significant difference was found in the intensity of depressive symptoms between adult children caregivers and non-caregivers. The value of filial and family obligation, inherent in Chinese culture, may serve as a buffering effect, limiting adult children caregivers’ stress and depressive symptoms. By providing care to their parents, the adult children caregivers in mainland China have achieved the sense of fulfilling their family obligations and their role as filial children (Lai, 2010). In addition, their behavior of providing care for their parents are likely recognized and praised by their parents and other people in their social network as filial and commendable, which provides much encouragement for the adult children caregivers. Thus, receiving positive psychological affirmation and support may moderate or reduce depression symptoms.

The findings that adult children caregivers in mainland China were less likely to report having difficulties with physical functions compared to adult children non-caregivers were not consistent with previous studies that reported poor physical health among caregivers (Sherwood & Given, 2011; Reinhard, 2015). Given Chinese cultural norms about family responsibilities (Liu, 2013), I speculated that the caregivers ignored their own chronic health problem when they devoted their time and energy to care for their aging parents. Public health programs are needed to inform and educate adult children caregivers about health issues and empower them to seek needed personal health care and supportive services. The ultimate goal for communities needs to be achieving health equity for caregivers, which means striving for the highest possible standard of health for all people and giving special attention to the needs of those at greatest risk of poor health, based on social conditions (Braveman, 2014).
Multiple linear regression models and moderation tests were used to estimate the moderating effect of employment status and gender on the association between the number of hours spent caregiving and depressive symptoms among caregivers. The findings indicated that unemployed son caregivers who spent more hours providing care reported highest levels of depressive symptoms whereas unemployed women caregivers who spent more hours providing care reported lower levels of depressive symptoms. Independent of working status, spending more hours providing care time predicted higher levels of depressive symptoms among men caregivers but lower depression among women caregivers. The effect of caregiving time on intensity of depression symptoms was moderated by both employment status and gender. Unemployed men caregivers who spent more time providing care to their parents(-in-law) reported the highest levels of depressive symptoms. Conversely, unemployed men caregivers who spent fewer hours providing care reported the lowest level of depressive symptoms. Findings suggest the buffering effect of working on the relationship between caregiving and depression symptoms varied by gender.

The findings contribute new evidence to the sparse existing literature on the effect of working on the mental health of adult children caregivers in mainland China. They lend support for the use of the stress and coping model to further understand the caregiving experience and suggest that both working status and gender buffered the effect of caregiving time on depression among adult children caregivers.

This study is not without limitations. First, data for this study came from a large national representative sample, but like other studies using secondary database, some variables suggested by Pearlin’s model were not included as part of the original survey or
were excluded due to the lack of specific or quality information available (e.g., family income, service use). For example, the primary variable of interest in this study was work status, but the questions included in the database could only be used to categorize participants as working or non-working; Future studies need to include information about the type of job position and work-related responsibilities in order to assess the influence of workload and work-related stress on adult children care for their older parents.

Second, the current study was based on the analyses of only the second wave of the CHARLS, which was collected in 2013. Only adult children who were providing care for their parents at the time of the survey were responded to the care-related questions. The cross-sectional dataset did not include people who may have stopped caregiving for any reason, including physical or psychological decline of the adult children caregivers or the older parents’ changing needs. Future research, using multiple waves of data (wave 1, 2 and 3), is necessary to conduct longitudinal analyses that include previous and current family caregivers and explore changes of in the health and well-being of caregivers over time.

More than 60% of the caregivers in this study were women of whom were employed for pay outside of the home. As future policies are developed, it is important for policy makers to take into account other responsibilities of family caregivers, such as working and raising children, to support caregivers who are employed so that they are not forced to choose between providing care for aging parents and engaging in paid work. Caregivers who are working can make valuable contributions to the economic marketplace that need to be sustained. This will benefit not only caregivers themselves, but also their families.
Overall, the findings of this study contribute to the understanding of the characteristics of family caregivers in mainland China and identified SDH that can be addressed as communities develop programs to support Chinese adult children caregivers. Findings can help shape and inform policies and programs for vulnerable populations and perhaps leverage opportunities to engage adult children caregivers in getting support with the goal of achieving health equity, which means striving for the highest possible standard of health for all people and giving special attention to the needs of those at greatest risk of poor health, based on social conditions.
REFERENCES


Braveman, P., Egerter, S., & Williams, D. (2011). The social determinants of health:

Coming of age. The Annual Review of Public Health, 32, 381-398. doi:
10.1146/annurev-publhealth-031210-101218

Braveman, P. (2014). What are health disparities and health equity? We need to be clear.

Public Health Reports, 129(Suppl 2), 5–8. Retrieve from
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3863701/


Dialogues in Clinical Neuroscience, 11(2), 217–228. Retrieve from

balance policies to influence key social/organisational issues. Asia Pacific Journal of
Human Resources, 46, 261–274. doi: 10.1177/1038411108095758


Whitehall II Study. The Journals of Gerontology Series A: Biological Sciences and
Medical Sciences, 68(10), 1316–1323. doi:10.1093/gerona/glt025

B, Psychological Science and Social Sciences, 59(6), 305-314. doi:
10.1093/geronb/59.6.S305

Calasanti & K. Slevin. (Eds.). Age Matters, New York: Routledge. (pp. 269-294)


http://digitalcommons.unl.edu/edpsychpapers/64


*Contemporary Sociology, 35*(1), 24-25. Retrieved from


doi:10.1161/STROKEAHA.109.568279


Liu, L., & Guo, Q. (2007). Loneliness and health-related quality of life for the empty nest elderly in the rural area of a mountainous county in China. *Quality of Life Research, 16*(8), 1275-1280. doi:10.1007/s11136-007-9250-0


Mackay, C., & Pakenham, K. I. (2011). Identification of stress and coping risk and protective factors associated with changes in adjustment to caring for an adult with


Retrieve from http://cornerstone.lib.mnsu.edu/cgi/viewcontent.cgi?article=1394&context=etds


Yan, B., Gao, X., & Lyon, M. (2014). Modeling satisfaction amongst the elderly in different Chinese urban neighborhoods. Social Science & Medicine, 118, 127-134. doi:10.1016/j.socscimed.2014.08.004


Zhang, W., O’Brien, N., Forrest, J., Salters, K., Patterson, T., Montaner, J., & Lima, V. (2012). Validating a Shortened Depression Scale (10 Item CES-D) among HIV-
positive people in British Columbia, Canada. PLoS ONE, 7(7), e40793.
http://doi.org/10.1371/journal.pone.0040793


Appendix A:

Table 1a

Demographic Characteristics of All Participants, Adult Children Caregivers and Non-caregivers, CHARLS Data, 2013

<table>
<thead>
<tr>
<th>Continuous Variable</th>
<th>All Participants 45+ Mean(SD)</th>
<th>Adult Children Caregivers Mean(SD)</th>
<th>Non-Caregivers Mean(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>56.8 (10.98)</td>
<td>50.4 (3.747)</td>
<td>57.44 (11.109)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Categorical Variable</th>
<th>Number (%)</th>
<th>Number (%)</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>8,861 (47.60)</td>
<td>403 (37.21)</td>
<td>8,458 (73.96)</td>
</tr>
<tr>
<td>Women</td>
<td>9,733 (52.30)</td>
<td>679 (62.69)</td>
<td>9,054 (26.04)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married or Cohabiting</td>
<td>16,136 (86.70)</td>
<td>1,006 (92.89)</td>
<td>15,146 (81.78)</td>
</tr>
<tr>
<td>Single (widowed, divorced, never married)</td>
<td>2,449 (13.30)</td>
<td>77 (7.10)</td>
<td>2,356 (11.40)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>4,353 (22.51)</td>
<td>378 (27.68)</td>
<td>3,975 (22.01)</td>
</tr>
<tr>
<td>Rural</td>
<td>14,189 (76.89)</td>
<td>703 (71.33)</td>
<td>13,486 (77.99)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>13,117 (77.86)</td>
<td>830 (75.31)</td>
<td>6,815 (74.90)</td>
</tr>
<tr>
<td>High school</td>
<td>3,730 (17.10)</td>
<td>166 (16.70)</td>
<td>1496 (18.00)</td>
</tr>
<tr>
<td>College and above</td>
<td>858 (5.01)</td>
<td>87 (7.99)</td>
<td>723 (7.10)</td>
</tr>
<tr>
<td>Currently Working</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1,287 (12.72)</td>
<td>216 (20.22)</td>
<td>1,018 (11.59)</td>
</tr>
<tr>
<td>No</td>
<td>17,318 (87.28)</td>
<td>867 (79.78)</td>
<td>7,784 (88.43)</td>
</tr>
</tbody>
</table>
Table 1b

*Community Social Economic Status (SES), CHARLS, 2013*

<table>
<thead>
<tr>
<th>Social Economic Status</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Very Poor</td>
<td>21</td>
<td>4.6</td>
</tr>
<tr>
<td>2 Poor</td>
<td>56</td>
<td>12.3</td>
</tr>
<tr>
<td>3 Relatively Poor</td>
<td>89</td>
<td>19.6</td>
</tr>
<tr>
<td>4 Middle</td>
<td>149</td>
<td>32.8</td>
</tr>
<tr>
<td>5 Relatively Rich</td>
<td>84</td>
<td>18.5</td>
</tr>
<tr>
<td>6 Rich</td>
<td>46</td>
<td>10.1</td>
</tr>
<tr>
<td>7 Very Rich</td>
<td>6</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>454</td>
<td>100</td>
</tr>
</tbody>
</table>

*a Used as a proxy estimate for individual respondent SES*
### Appendix B:

**Table 2**

<table>
<thead>
<tr>
<th>Study Variables, Response Code and Note</th>
<th>Variable Name</th>
<th>Response Code</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Actual age</td>
<td>Age in years</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Men</td>
<td>Men=0</td>
<td>Women=1</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Region</td>
<td>Rural</td>
<td>Urban=0</td>
<td>Rural=1</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Less than high school</td>
<td>Less than high school=0</td>
<td>High school and above=1</td>
</tr>
<tr>
<td></td>
<td>High school and above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td>Married or cohabiting</td>
<td>Married or cohabiting=1</td>
<td>Divorced/separated, widowed or never married=0</td>
</tr>
<tr>
<td></td>
<td>Divorced/separated, widowed or never married</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living Arrangement</td>
<td>Living with spouse and people other than spouse</td>
<td>Living with spouse and people other than spouse=2</td>
<td>Living only with spouse=1</td>
</tr>
<tr>
<td></td>
<td>Living only with spouse</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Living alone</td>
<td>Living only with spouse=1</td>
<td>Living alone=0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TimeCaregiving</td>
<td>Hours spent on providing care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment Status</td>
<td>Working</td>
<td>Working=1</td>
<td>Not working=0</td>
</tr>
<tr>
<td></td>
<td>Not working</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>CESD score</td>
<td>Higher values = more depressive symptoms</td>
<td></td>
</tr>
<tr>
<td>Satisfied with life</td>
<td>Likert Scale Score</td>
<td>5 = completely satisfied to 1 not at all satisfied</td>
<td></td>
</tr>
<tr>
<td>ADL</td>
<td>Likert Scale Score</td>
<td>1= no difficulty to 4= absolutely cannot do it</td>
<td></td>
</tr>
<tr>
<td>IADL</td>
<td>Likert Scale Score</td>
<td>1= no difficulty to 4= absolutely cannot do it</td>
<td></td>
</tr>
<tr>
<td>Chronic Diseases</td>
<td>No chronic disease</td>
<td>No chronic disease=0</td>
<td>1 chronic disease=1</td>
</tr>
<tr>
<td></td>
<td>1 chronic disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 or more chronic disease</td>
<td>2 or more chronic disease=2</td>
<td></td>
</tr>
</tbody>
</table>