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Research article

The Burden of Grandparenting among Chinese older adults in the Greater Chicago area—The PINE Study

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Abstract: Grandparent caregiving responsibilities influence feelings of burden in many older adults. Though grandparenting is traditionally seen as a rewarding experience for Chinese older adults, some research has pointed to the possibility of grandparenting burden in Chinese older adults in the U.S. However, there is a paucity of research concerning prevalence of grandparenting burden in Chinese older adults. This study aims to provide an overall estimate on grandparenting burden and examine its correlations with socio-demographic characteristics, self-reported health data, and time spent caring for grandchildren. Data was collected through the Population Study of Chinese Elderly in Chicago (PINE) study. This community-based participatory research study surveyed a total of 3,159 Chinese older adults aged 60 and above, 2,146 of whom have grandchildren. We used four questions on a Likert-scale to determine levels of grandparenting burden. Our study found 22% of our participants who are grandparents experience grandparenting burden. Younger age (r = 0.12), living with four or more people (r = 0.09), lower overall health status (r = 0.09), lower quality of life (r = 0.09), and more time spent caring for grandchildren (r = 0.37) were correlated with grandparenting burden. Our findings show that grandparenting is not a necessarily rewarding experience for Chinese older adults, and that certain subsets of the population are more likely to experience grandparenting burden. Future longitudinal research should be conducted to determine causality as well the psychological, physical, and social effects of grandparenting burden.

Keywords: grandparenting burden; Chinese aging; older adults; prevalence; health; population study

1. Introduction

Grandparenting is perceived as a rewarding experience for many Chinese older adults [1]. Indeed, traditional Chinese values emphasize the importance of the multi-generational family and collective identity [2,3]. Traditional Confucian beliefs emphasize older adults and grandparents as important and valued due to their wisdom and experiences, which may lead to appreciation from children and positive grandparenting experiences [4]. Therefore, for many Chinese families, it is culturally relevant for grandparents to provide substantial care for their grandchildren [5]. For thousands of years, Chinese familial relations have been modeled off these Confucian ideas, and

caring for grandchildren has traditionally been considered sacrosanct, especially for women [6]. Taking care of a grandchild is not merely a favor among family members, but often seen as necessary to bind together generations, preserving closeness and continuity of the family by maintaining reverence for the wisdom of elders [6]. Chinese elders are expected to provide care for their grandchildren because they are expected to pass down wisdom, advice, and life experiences.

However, in the United States, grandparenting is sometimes a taxing experience for older adults due to the overwhelming nature of caring for children, financial burden, diminishing time for self-care, and related psychological well-being effects [7,8]. The amount of grandparenting responsibility may be overwhelming for older adults who have less energy or preexisting health conditions [7]. Stress from grandparenting can also contribute to the worsening of preexisting health conditions [9–11]. Despite traditional Chinese values concerning the necessarily positive role of grandparenting in older adults' lives, the reality may be much more complex.

In the U.S. Chinese aging population, not only do these individuals face the physical frailty that accompanies older age [12,13], but also there are social and cultural factors which contribute to their vulnerability for grandparenting burden. Though not all Chinese people immigrate to the U.S. for the same reasons, historical review has indicated that many Chinese immigrate to reunite with their families, often with expectation of co-residence and an active role in grandchild caregiving [14,15]. Migration to the U.S. may result in the erosion of Confucian values and/or disparities in cultural adherence between generations, which complicates and may increase grandparenting burden or decrease satisfaction [16,17]. As immigrants, Chinese older adults are more likely to experience intergenerational value discrepancies, as well [18]. Given their increased likelihood of living in intergenerational homes, Chinese older adults may be more vulnerable to grandparenting burden [19], issues concerning acculturation [20], and the dissolution of traditional Confucian values which emphasize reverence toward the elderly and grandparents [18]. Furthermore, there is evidence of these discrepancies and lack of adequate social support in Chinese older adult population [21–23].

Chinese older adults often make professional or social sacrifices to care for their grandchildren and thus may have an even more limited community support network [5]. Among grandparent caregivers in Taiwan, a majority of caregivers reported psychological distress, even though most had support from family members [24]. Asian Americans have described their caregiving responsibilities as confining, making them prone to isolation [25]. Despite these Confucian values emphasizing the positive reciprocity of grandparent care, it is unknown if these values are still germane to all generations involved in grandparent caregiving in the U.S.

Furthermore, the level of grandparenting burden among Chinese older adults in China, Taiwan, and Hong Kong is relatively unknown, despite extensive literature about grandparenting in China and its relationship to health [4,26]. Of quantitative research conducted in China, a few studies have indicated that grandparents provide substantial care for grandchildren [28–30]. Another quantitative study found that urban Chinese grandmothers did not endorse better well-being, perhaps due to accompanying caregiver burden [28]. An ethnographic study of grandparents in Xiamen, China highlighted diminishing rewards and prominent physical exhaustion despite a strong desire to adhere to cultural values of familial obligation [27]. Among grandparents in Hong Kong, researchers found significant endorsement of perceived level of grandparenthood stress related to relationship-oriented and grandparent role issues [31]. Also, in a comparison of grandparenting role "difficulties" between grandparents in the U.S. and China, Chinese grandparents are more likely to rate the grandparenting experience much lower than American grandparents [32]. In sum, though there is a growing body of research concerning grandparenting in China, grandparenting burden is more alluded to, than examined directly [33].

In addition, there is a dearth of research which examines the Chinese older adult grandparenting burden in the United States. Though there have been many studies examining negative outcomes of grandparenting, most quantitative studies examine African-American and Caucasian grandparents, especially in regard to custodial grandparenting roles [32,34,35]. There is very sparse knowledge regarding grandparenting burden among older Asian Americans [36]. Research about Asian American older adults and their grandparenting experience has highlighted both reward and burden, though through qualitative and ethnographic study design [5,25,37]. Given our knowledge of the unique immigration patterns, acculturative processes, and demographics of Chinese older adults in the U.S., we do not expect there to be an apt comparison in quantitative data between these listed populations and our study population.

Furthermore, it may be difficult to make claims about prevalence of grandparenting burden among Chinese older adults in the U.S. because of lack of data and incomparable measurements. There is a large variety of measurements used in grandparenting burden research, many of which indirectly measure burden. A few scales have been used to examine grandparenting burden: the Zarit Burden Interview [7] and a 9 item scale developed by Lawton and colleagues [8,38], both of which were used in Caucasian and African American populations. Other studies have looked at life satisfaction or quality of life among Chinese older adults in China and Taiwan to make inferences about grandparenting burden [24,33]. Stress has also been examined in relationship to grandparenting in Hong Kong [31], but stress has specific psychological implications which should not be inferred in examining perceived burden of grandparenting. In order to counter or validate the perception of universally positive grandparenting experiences among Chinese older adults in the U.S., it is necessary to examine the existence of any grandparenting burden using culturally relevant measurements.

To provide an overall approximation of grandparenting burden among Chinese older adults in the U.S., this study aims to 1) evaluate the prevalence of grandparenting burden and 2) examine the correlations between grandparenting burden, hours spent on grandparenting, socio-demographic characteristics, and self-reported health and quality of life measures.

2. Methods

2.1. Population and settings

The Population Study of Chinese Elderly in Chicago (PINE) is a population-based epidemiological study of U.S. Chinese older adults aged 60 and over in the greater Chicago area. The purpose of the PINE study is to collect community-level data of U.S. Chinese older adults to examine the key cultural determinants of health and well-being. The project was initiated by a synergistic community-academic collaboration among Rush Institute for Healthy Aging, Northwestern University, and many community-based social services agencies and organizations throughout the greater Chicago area [39].

In order to ensure study relevance to the well-being of the Chinese community and enhance community participation, the PINE study implemented culturally and linguistically appropriate community recruitment strategies strictly guided by a community-based participatory research (CBPR) approach. A Community Advisory Board (CAB) assisted in the recruitment of participants and determining the cultural and linguistic relevancy of study materials and helped to overcome related barriers to effective research [40–42]. Workshops were conducted to gain insight on relevant health topics among Chinese older adults [43]. Over twenty social services agencies, community centers, health advocacy agencies, faith-based organizations, senior apartments and social clubs serving as

study recruitment sites, where eligible participants were approached during routine social service and outreach efforts serving Chinese Americans families in the Chicago city and suburban areas. All participants consented and were interviewed by trained bicultural research assistants in English or Chinese dialects, including Mandarin, Cantonese, Toisanese, and Teochow, according to respondents' preference [44]. Out of 3,542 eligible participants, 3,159 agreed to participate in the study, yielding a response rate of 91.9%. The collected data on grandparenting burden items comes only from the 2,146 participants who have grandchildren.

Based on the available census data drawn from U.S. Census 2010 and a random block census project conducted in the Chicago's Chinese community, the PINE study is representative of the Chinese aging population in the greater Chicago area with respect to key demographic attributes [45], including age, sex, income, education, number of children, and country of origin. The study was approved by the Institutional Review Boards of the Rush University Medical Center.

2.2. Measurements

2.2.1. Socio-demographics

Basic demographic information was collected, including age (in years), sex, education level, annual income (in USD), marital status, number of children, number of grandchildren, living arrangement, and country of origin. Immigration data relating to participants' years spent living in the U.S. and years residing in their current community were also collected. Education level was assessed by asking participants their highest educational level completed in years. We created a dichotomous country of origin variable by categorizing respondents into the "China" group if they were born in mainland China and "other" group for other countries and regions. Living arrangement was assessed by asking participants how many people live in their household besides themselves and was categorized into four groups: (1) living alone; (2) living with 1–2 persons; (3) living with 2–3 persons; (4) living with 4 more persons. Self reported annual income included income from all sources, such as wages, salaries, social security or retirement benefits, help from relatives, rent from property, etc. Annual income was categorized into four groups: (1) $0–$4,999 per year; (2) $5,000–$9,999 per year; (3) $10,000–14,999 per year; and (4) more than $15,000 per year. Language was assessed by ability to speak and preference of English, Cantonese, Mandarin, or Toisanese.

2.2.2. Overall health status, quality of life, and health changes over the last year

Overall health status was measured by "In general, how would you rate your health?" on a four point scale (1 = poor, 2 = fair, 3 = good, 4 = very good). Quality of life was assessed by asking "In general, how would you rate your quality of life?" on a four point scale (1 = poor, 2 = fair, 3 = good, 4 = very good). Health change in last year was measured by the question "Compared to one year ago, how would you rate your health now?" on a five point scale (1 = much worse; 2 = somewhat worse; 3 = about the same; 4 = somewhat better; and 5 = much better than one year ago). Health changes were then categorized into three groups: (1) improved health; (2) same health; and (3) worsened health.

2.2.3. Grandparenting burden

Our study administered a four-question scale to assess grandparenting burden. This scale was co-developed by our bilingual research team and CAB members based on extensive literature search, as well as knowledge of the community health and cultural issues. The questions were first

developed in Chinese and then translated into English. The term "burden" is used to contrast this negative grandparenting experience with grandparenting reward. Further, "burden" differs from "stress" due to the psychological implications of the latter. The questions have been developed to be culturally relevant to Chinese older adults in the U.S. We chose to ask "how often" rather than "do you feel" because we believe a binary of "yes" or "no" options would encourage Chinese older adults to say "no," due to cultural values of saving face [13].

First, we asked how many hours were spent caring for grandchildren with the question, "On average, how many hours a week do you spend taking care of grandchildren?" and an integer amount was recorded. Then, we used a series of four questions to determine grandparenting burden among our participants on a five point Likert-type scale. Pressure to take care of grandchildren was measured by the question "How often do you feel pressured by your sons/daughters to take care of their children?" (0 = never, 1 = little, 2 = sometimes, 3 = often, 4 = always). Caregiving burden was measured by the question "How often do you feel it is a burden to take care of your grandchildren?" (0 = never, 1 = little, 2 = sometimes, 3 = often, 4 = always). Grandparenting effects on health were measured by the question "How often do you feel that your own health is negatively affected as a result of taking care of your grandchildren?" (0 = never, 1 = little, 2 = sometimes, 3 = often, 4 = always). Lastly, being prevented from seeing grandchildren was measured by the question "How often do you feel it that your son, son-in-law, daughter and/or daughter-in-law are intentionally preventing you from seeing/talking to your grandchildren?" (0 = never, 1 = little, 2 = sometimes, 3 = often, 4 = always).

2.3. Data analysis

Descriptive univariate statistics were used to summarize socio-demographic characteristics and the presence of prevalence of grandparenting burden among the sample population. *Chi*-squared tests were used to compare the bivariate socio-demographic differences between no grandparenting burden group and any grandparenting burden group. The Pearson Correlation coefficients were used to examine the correlations between socio-demographic variables, hours spent caring for grandchildren, and prevalence of grandparenting burden. Statistical analyses were conducted using SAS, Version 9.2 (SAS Institute Inc., Cary, NC).

3. Results

3.1. Sample Characteristics

Among 3,159 participants enrolled in the PINE Study, 58.9% were female, 71.3% were married, and 85.1% had an annual income below $10,000. Out of those 3,159 participants, 2,146 had grandchildren. Out of these participants, 59.8% were female, 71.1% were married, 93.7% were born in China, and 87.8% had an annual income below $10,000. Most participants (64.7%) did not spend any time caregiving for grandchildren; 9.0% of participants spent 1–10 hours taking care of grandchildren; 7.7% spent 11–20 hours taking care of grandchildren; 4.2% spent 21-30 hours taking care of grandchildren; and 14.4% spent 31 or more hours taking care of grandchildren. Around one in five (22%) of participants reported feeling any grandparenting burden as shown in Table 1. The highest prevalence among participants who experienced any grandparenting burden was exhibited in those ages 60–64 (22.3%, $P < 0.001$), who live with four or more people (34.0%, $P < 0.001$), who have lived 11–20 years in the US (33.5%, $P < 0.001$), born in China (96.6%, $P < 0.001$), and with a language preference of Cantonese (53.4%, $P < 0.001$). Those with a poor health status and those with

a fair or poor quality of life constituted a higher percentage of participants with grandparenting burden versus those without (22.6% vs. 19.6%, $P < 0.001$ and 57.7% vs. 48.0%, $P < 0.001$, respectively).

Table 1. Characteristics of PINE study participants by any grandparenting burden.

	Any Burden $N = 470$	No Burden $N = 1676$	χ^2	d.*f*	*P*
Age, *N* (%)					
60–64	105 (22.3)	270 (16.1)			
65–69	104 (22.1)	306 (18.3)			
70–74	104 (22.1)	345 (20.6)			
75–79	85 (18.1)	325 (19.4)			
80+	72 (15.3)	430 (25.7)	28.5	4	< 0.001
Sex, *N* (%)					
Male	170 (36.2)	692 (41.3)			
Female	300 (63.8)	984 (58.7)	4.0	1	0.045
Education (years), *N* (%)					
0	46 (9.9)	108 (6.5)			
1–6	188 (40.3)	679 (41.7)			
7–12	163 (34.9)	518 (31.0)			
13–16	63 (13.5)	303 (18.1)			
17+	7 (1.5)	44 (2.6)	14.3	4	0.006
Income (USD), *N* (%)					
$0–$4,999	173 (37.0)	559 (33.6)			
$5,000–$9,999	254 (54.3)	889 (53.4)			
$10,000–$14,999	29 (6.2)	161 (9.7)			
$15,000–$19,999	3 (0.6)	27 (1.6)			
$20,000 and over	9 (1.9)	30 (1.8)	8.8	4	0.07
Marital Status, *N* (%)					
Married	351 (74.7)	1,172 (70.1)			
Separated	8 (1.7)	24 (1.4)			
Divorced	9 (1.9)	34 (2.0)			
Widowed	102 (21.7)	443 (26.5)	4.6	3	0.20
Living Arrangement, *N* (%)					
Living alone	85 (18.1)	354 (21.1)			
1	178 (37.9)	703 (42.3)			
2–3	47 (10.0)	210 (12.5)			
4 or more	160 (34.0)	402 (24.0)	19.5	3	< 0.001
Number of Children, *N* (%)					
0	10 (2.1)	44 (2.6)			
1–2	155 (33.0)	541 (32.3)			
3 and more	305 (64.9)	1,091 (65.1)	0.4	2	0.81
Number of Grandchildren, *N* (%)					
1–2	75 (16.0)	279 (16.7)			
3 and more	395 (84.0)	1,397 (83.4)	0.1	1	0.72
Years in the US, *N* (%)					
0–10	112 (23.9)	445 (27.3)			

11–20	157 (33.5)	503 (23.5)			
21–30	114 (30.7)	403 (24.1)			
31+	56 (11.9)	309 (18.5)	18.2	3	< 0.001
Years in the Community, *N* (%)					
0–10	283 (60.5)	984 (58.8)			
11–20	106 (22.7)	355 (21.2)			
21–30	60 (12.8)	216 (12.9)			
31+	19 (4.1)	118 (7.1)	5.6	3	0.13
Country of Origin, *N* (%)					
China	454 (96.6)	1557 (92.9)			
Other	16 (3.4)	119 (7.1)	18.8	1	< 0.001
Language preference, *N* (%)					
English	1 (0.2)	13 (0.8)			
Cantonese	251 (53.4)	855 (51.01)			
Mandarin	68 (14.5)	403 (24.1)			
Toisanese	250 (31.9)	405 (24.2)	26.1	3	< 0.001
Overall Health Status, *N* (%)					
Very good	7 (1.5)	74 (4.4)			
Good	134 (28.5)	619 (36.9)			
Fair	223 (47.5)	654 (39.0)			
Poor	106 (22.6)	329 (19.6)	23.7	3	< 0.001
Quality of Life, *N* (%)					
Very good	14 (3.0)	114 (6.8)			
Good	185 (39.4)	757 (45.2)			
Fair	258 (54.9)	762 (45.5)			
Poor	13 (2.8)	42 (2.5)	18.8	3	< 0.001
Health Changes over the Last Year, *N* (%)					
Improved	40 (8.5)	134 (8.0)			
Same	198 (42.1)	810 (48.4)			
Worsened	232 (49.4)	731 (43.6)	5.8	2	0.05

3.2. Correlation of grandparenting burden scale items

Grandparenting burden scale item correlations were presented in **Table 2**. For all items the correlation coefficient (r) was between 0.07 and 0.56. The pressure to take care of grandchildren was correlated to feeling like it was a burden to take care of grandchildren at $r = 0.56$, $P < 0.001$. Feeling like it was a burden to take care of grandchildren was correlated to feeling like children or children's spouses prevented participants from seeing their grandchildren at $r = 0.07$, $P < 0.01$. The raw alpha was $\alpha = 0.66$

Table 2. Grandparenting burden scale item-total correlations and correlation coefficients.

	Alpha if item deleted	1	2	3	4
1. Felt pressured by children to take care of grandchildren	0.50	1.0			
2. Felt it is a burden to take care of grandchildren	0.47	0.56***	1.0		
3. Felt that health is negatively affected as a result of taking care of grandchildren	0.52	0.44***	0.52***	1.0	
4. Felt that children and/or children-in-law intentionally prevented you from seeing or talking to grandchildren	0.74	0.07***	0.07**	0.08***	1.0

Alpha = 0.66, *$P < 0.05$, **$P < 0.01$, ***$P < 0.001$

3.3. Endorsement of grandparenting burden items

The frequency of the grandparenting burden items was presented in **Table 3**. Nearly one in five (18.9%) participants felt it was a burden to take care of grandchildren. Around one in ten (9.9%) participants felt pressured by children to take care of grandchildren. Similarly, around one in ten (10.2%) participants felt their health was negatively affected by taking care of their grandchildren. However, only 1% of participants felt like their children or children's spouses intentionally prevented them from seeing or talking to grandchildren.

Table 3. Endorsement of grandparenting burden items.

	Never, *N* (%)	Little, *N* (%)	Sometims, *N* (%)	Often, *N* (%)	Always, *N* (%)
1. Felt pressured by children to take care of grandchildren	1,933 (90.1)	120 (5.6)	59 (2.8)	19 (0.9)	15 (0.7)
2. Felt it is a burden to take care of grandchildren	1,737 (81.1)	151 (7.1)	165 (7.7)	46 (2.2)	44 (2.1)
3. Felt that health is negatively affected as a result of taking care of grandchildren	1,924 (89.8)	120 (5.6)	73 (3.4)	14 (0.7)	11 (0.5)
4. Felt that children and/or children-in-law intentionally prevented you from seeing or talking to grandchildren	2,124 (99.0)	11 (0.5)	9 (0.4)	1 (0.1)	1 (0.1)

3.4. Correlation of socio-demographic factors and grandparenting burden

Factors including age, living arrangement, country of origin, overall health status and quality of life were significantly correlated with grandparenting burden in **Table 4**. Older age ($r = 0.12$, $P < 0.001$), higher overall health status ($r = 0.09$, $P < 0.001$), higher quality of life ($r = 0.09$, $P < 0.001$) were associated with lower prevalence of grandparenting burden. Living with more people ($r = 0.09$, $P < 0.001$), being born in China ($r = 0.06$, $P < 0.01$), and preferring to speak Cantonese ($r = 0.07$, $P < 0.01$) were associated with higher prevalence of grandparenting burden. Greater number of hours spent caring for grandchildren ($r = 0.37$, $P < 0.001$) was correlated with higher prevalence of grandparenting burden.

Table 4. Correlations between any grandparenting burden and socio-demographic variables.

	Age	Sex	Edu	Inc	MS	Living	Child	Grand Ch	Yrs in U.S.	Yrs in com	Origin	Lang Pref	OHS	QOL	HC	Grand	Hours
Age	1.0																
Sex	0.01	1.0															
Edu	-0.12***	-0.21***	1.0														
Inc	0.05**	0.00	0.01	1.0													
MS	-0.33***	-0.32***	0.22	-0.03	1.0												
Living	-0.35***	-0.07***	0.02	0.16***	0.24 ***	1.0											

Child	0.32***	0.09***	-0.38***	0.00	-0.13***	-0.07***	1.0									
Grand Ch	0.43***	0.12***	-0.39***	-0.02	-0.18***	-0.10***	0.72***	1.0								
Yrs in U.S.	0.35***	0.03	-0.10***	0.35***	-0.2***	-0.31***	0.15***	0.17***	1.0							
Yrs in com	0.23 ***	0.02	-0.11***	0.24***	-0.13***	-0.18***	0.10***	0.10***	0.66***	1.0						
Origin	0.04*	-0.01	-0.08***	-0.20	0.05**	0.05**	0.04*	0.06***	-0.2***	-0.15***	1.0					
Lang Pref	-0.02	-0.01	-0.56***	-0.03	-0.06***	0.06***	0.27***	0.25***	0.18***	0.20***	0.06**	1.0				
OHS	0.08***	0.06**	-0.06***	-0.12***	-0.05**	0.00	0.00	-0.02	0.01	-0.05*	0.03	0.01	1.0			
QOL	-0.06***	-0.05**	-0.09***	-0.08***	0.03	0.01	-0.04*	0.05**	0.00	0.02	0.04*	-0.12***	0.32***	1.0		
HC	0.11***	0.03	-0.02	-0.05**	-0.07***	-0.01	0.02	-0.05	0.04*	-0.03	0.00	0.03	0.35***	0.15***	1.0	
Grand	-0.12***	0.04*	-0.05*	-0.04	0.04*	0.09***	-0.01	0.04	-0.03	-0.04	0.06**	0.07**	-0.09***	-0.09***	-0.03	1.0
Hours	-0.32***	0.04	0.01	-0.14***	0.09***	0.34***	-0.10***	-0.04*	-0.17***	-0.11***	0.04*	0.02	0.04*	0.04*	0.07***	0.37***	1.0

4. Discussion

As the first population-based epidemiological study that reported the experience of grandparenting burden among U.S. Chinese older adults, the PINE Study indicates that grandparenting burden is experienced by one in five (22%) Chinese older adults in the Greater Chicago area. As reported, Chinese older adults are more likely to experience grandparenting burden if they are younger, live with more people, were born in China, have a poorer overall health status, a poorer quality of life, and spend more time caring for grandchildren. Among our study participants who are grandparents, nearly 65% do not spend any time caring for children, which is significantly more than a study among Chinese older adults in China has reported [29]. In a study of 90 grandmothers in the U.S., ages 39 to 82 years, who lived with at least one grandchild and participated in their care, 38% of grandmothers scored within the 90th percentile on the Parental Stress Index, indicating a clinically significant stress level [46]. However, current literature does not give comparable estimates about grandparenting burden in either the general US older population or specific ethnic/racial groups. In one of the few studies to directly measure burden, a majority of Caucasian and African American custodial grandmothers in skipped generation households indicated that their grandparenting responsibilities affected their social life, privacy, and energy levels [38]. However, since this study examined custodial grandmothers, and not a gradient of grandparenting among both genders, the lack of similar data indicates the need for research to evaluate the prevalence of grandparenting burden among general populations as well as specific ethnic groups across the U.S. However, it is known that there is a normative cultural expectation of finding grandparent caregiving necessarily rewarding [4,25,37], and our findings indicate a contradictory lived experience.

In our study, Chinese older adults experience more grandparenting burden if they are younger. This may occur for a variety of reasons: younger grandparents may have younger grandchildren who require more care, or caregiving responsibilities may interfere more with their livelihood/occupation. Indeed, there has been a growing trend among Chinese grandmothers in China to take up hobbies or new jobs in retirement, instead of solely taking care of grandchildren; this signals a trend that able-bodied, younger Chinese older adults have values beyond traditional Confucianism [6]. Our findings both support and contrast current literature. In a population study of over 13,000 grandparents in the U.S., younger age was found to be an indicator of starting caregiving practices [47]. Younger grandparents may be more inexperienced and therefore, have greater difficulties caring for grandchildren. In a multi-generational study of Chinese families living in Taiwan, Chinese older grandparents aged 60 and up, compared to younger Chinese grandparents aged 59 or younger, rated themselves as being more successful at grandparenting, likely due to level of experience [32]. However, in a study of Hong Kong grandparents, stress was not significantly correlated with age of the grandparent [31]. As a result, future research should examine age in relationship to burden, taking into account occupational/social sacrifices and grandchildren's ages, among Chinese older adults in the United States in order to ascertain a clearer picture of grandparenting burden prevalence and causation.

We found that Chinese older adults are more likely to experience grandparenting burden if they live in a household with at least four other people. Existing literature does not directly compare grandparenting burden with living arrangement by number of people. However, literature does indicate that grandparents who reside with their grandchildren experience higher levels of

grandparenting stress [7,48]. We did not collect data on household composition, so we are unable to determine if grandparenting burden is related to co-residence with grandchildren. Still, given the traditional Chinese value of multigenerational households, it would be unsurprising if a living arrangement of four or more people reflected a three-generation household. U.S. Census reports have also indicated that Chinese older adults live with grandchildren at higher rates than African-American, Hispanic, Caucasian, and Japanese older adults [14]. Further, a study in urban China of grandparents found that co-residence and grandparenting responsibilities greatly limited their freedom and increased feelings of burden, despite a self-imposed sense of obligation [27].

Additionally, many Chinese older adults immigrate to the U.S. in order to be reunited and live with family [15], but experience ambivalence about their new roles. As reported by a study of Chinese American grandmothers in the U.S., over 40% of those participants reported experiencing language barriers with their grandchildren [37]. These intergenerational issues with grandchildren or children as a result of caregiving may be exacerbated if the individual resides with their grandchildren or children. These intergenerational, immigration-related barriers are especially relevant given that nearly all of our participants are immigrants. Future research should examine whether household composition, more specifically co-residing with grandchildren, influences levels of grandparenting burden among Chinese older adults and how this may be tied to intergenerational conflict or acculturative stress.

Our study found that Chinese older adults who reported poorer health status and quality of life are more likely to experience grandparenting burden. Our findings both confirm and conflict with existing literature about health and grandparenting correlations. In a study of Chinese grandparents in China who care for grandchildren, high intensity care for younger grandchildren accelerated health declines, while lighter levels of care had a protective effect on health [4]. In a longitudinal study of Taiwanese grandparents in Taiwan, caring for grandchildren showed improvements in self-rated health, especially for long-term caregivers [49]. Among the general U.S. older adult population, grandparents who care for their grandchildren were significantly more likely to report poorer mental health [50]. In one of the few studies of Chinese American grandmothers and the psychological effect of grandmothering, researchers found the presence of grandparenting challenges regarding isolation and generational differences [37]. A population study of grandparents in the U.S. found that effects of grandparenting caregiving on health were contingent on the context and circumstances of the care [51]. Given these diverse findings, future research should examine the mental and physical health of Chinese grandparents in the U.S. on multiple frequencies of care levels, using a longitudinal study design to note any possible changes due to differing grandparenting responsibility.

Lastly, our study found that Chinese older adults who spend more time caring for grandchildren are more likely to experience grandparenting-related burden. This is consistent with previous literatures. However, it is likely that amount of hours spent caring for grandchildren in relationship to grandparenting burden is not linear. As previous literatures about African American grandparents have suggested, there may be a cutoff point or ideal amount of time spent with grandchildren where rewards outweigh stresses [7,52,53]. Existing literature has yet to suggest or deny that this is a similar experience for Chinese grandparents. Future research should focus not only on older adults who provide extensive care for their grandchildren in relationship to burden-related outcomes, but also look at the spectrum of grandparent caregiving to determine correlations and causations between hours spent caregiving and mental health outcomes.

Our study is not without limitations. First, our study is representative of Chinese older adults in

the US, but these findings may not be generalizable to the U.S. Chinese population or Chinese in Asia. There is a high degree of intra-group diversity within the Chinese ethnicity. Second, we did not record the ages of the grandchildren or household composition, which limits our knowledge about the type and intensity of caregiving Chinese older adults provide. Furthermore, we did not inquire about reasons why grandparents care for their grandchildren, whether it is due to traditional Chinese roles or financial difficulties, or other reasons. Even though research indicates cultural relevance of filial piety and grandparenting among Chinese immigrants, we did not ask participants about their individual expectations, family's expectations, or cultural expectations of grandparenting responsibility. Also, given the cross-sectional nature of this study, we are both unable to provide causations of grandparent burden and examine if grandparent burden changes over time, or due to which factors. Grandparenting burden and reward are not exclusive [31], and in-depth qualitative research is likely necessary to have a more complete understanding of the grandparenting experience of Chinese older adults in the U.S.

Still, our study's findings present important implications for future research. This study challenges the common perception that grandparenting is a universally rewarding experience for Chinese older adults due to cultural values. This indicates that research should focus on finding causation for grandparenting burden and the circumstances which differentiate grandparenting burden from grandparenting reward, which likely include criteria like living arrangement, age, and time spent caring for grandchildren. Given the majority of Chinese older adults are immigrants, the immigration and acculturation processes in relationship to grandparenting burden and responsibilities needs to be more closely examined. Further, our study indicates that health status, quality of life, and grandparenting burden are related, indicating that research should focus on the psychological, physical, and social effects of grandparenting burden.

5. Conclusion

Grandparenting within the Chinese older adult community is not a necessarily rewarding experience. Our study found that grandparenting burden is experienced by 1 in 5 Chinese older adults with grandchildren. Due to the deleterious effects of feelings of burden and stress on psychological and physical well-being, this is an area of concern. Our study found that certain subsets of the Chinese older adult population are more likely to experience grandparenting burden, including younger grandparents, those living with many people, those who spend more time caring for grandchildren, those who have poorer health, and those with a lower quality of life. These vulnerable populations should be the focus of future research to determine the causes of grandparenting burden, its specific effects on the health, and wellbeing of older adults.

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Conflict of Interest

Authors report no conflict of interest.

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