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The Impact of Community-Based Supports and Services on Quality of Life Among the Elderly in China: A Longitudinal Study

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Abstract

Community-based supports and services (CBSS) have been developing rapidly in China as a new way of satisfying the needs of elderly people. However, it is not clear how pervasive these services are or whether the availability of CBSS impacts quality of life. This study examines trends in CBSS and the impact of the perceived CBSS availability on self-reported quality of life among the elderly in China. We found a significant increase in perceived CBSS availability from 2005 to 2011, but the perceived availability of CBSS varies by the type of CBSS. Multivariate analyses show that home medical visits ($\beta = .181, p = .03$), psychological support ($\beta = .332, p = .02$), social and recreation activities ($\beta = .231, p = .02$), and legal consulting services ($\beta = .271, p = .02$) were each significantly associated with a good quality of life. Results from this study provide insight that can inform CBSS strategies and the development of new services for the elderly in China.

Keywords

self-reported quality of life; population aging; community-based supports and services; elderly

Introduction

China is experiencing rapid and profound demographic changes and its population is aging rapidly. The latest population census shows that the share of the total population aged 14 and younger has declined from 22.9% in 2000 to 16.6% in 2010, whereas the proportion aged 65 and older has grown from 7.0% to 8.9% (Peng, 2011). This trend is expected to continue as the proportion of the population that is 65 and older is projected to increase to 22.7% by 2050 (United Nations Department of Economic Social Affairs, 2002). By then, the median age of the Chinese population will have gone from the current 37 years to almost 50 years

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Authors' Note

Secondary data used for this research are from the "Chinese Longitudinal Healthy Longevity Survey" (CLHLS), collected and managed by the Center for Healthy Aging and Development Studies, Peking University.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical Approval

This study uses secondary de-identified historical data and was exempt from human subject considerations.

(United Nations Department of Economic and Social Affairs, 2015). This rapid aging of the population presents both opportunities and challenges. First, having more people with increasing longevity generally indicates that the population is healthier overall and, as a result, is living longer. In addition, this longer life expectancy will likely result in extended working years (Bloom, Boersch-Supan, McGee, & Seike, 2011). However, population aging also presents fundamental challenges in terms of social security, health insurance, health care utilization, and the provision of other types of care for the elderly. Policy responses targeting these challenges will be required to sustain economic growth in this new era of population aging (Woo, Kwok, Sze, & Yuan, 2002; N. J. Zhang, Guo, & Zheng, 2012).

China and many other East Asian societies share a tradition, commonly referred to as filial piety, that adult children are expected to respect, support, and take care of their parents (Ng, Phillips, & Lee, 2002; Sung, 2001). Filial piety has long been a primary moral principle shaping parent–child relations in China (Hwang, 1999). Therefore, family has played a central role in elderly care for centuries (Canda, 2013; L. Cheng, Liu, Zhang, Shen, & Zeng, 2015). However, evidence indicates that this tradition has been eroding in the past two decades, in part due to a decline in fertility, the nationwide one-child policy, and rural–urban migration for job opportunities (Giles, Wang, & Zhao, 2010; Y. Zhang & Goza, 2006). More and more elderly individuals now live alone without the coresidence of adult children. This change has the potential to contribute to various problems. Studies conducted in China indicated that living alone as an elderly person is associated with higher risk of mental health problems, lower levels of satisfaction with their life, and higher suicide rates (Liu & Guo, 2008; C. W. Wang, Chan, & Yip, 2014; Z. Q. Wu et al., 2010; Xie, Zhang, Peng, & Jiao, 2010). Given these changes to family structure, the collapse of filial piety traditions, and the potential negative health implications among the elderly, new interventions focused on supporting the elderly are necessary.

The Chinese government has been working to improve the security and support among the elderly by evoking family responsibility and reinforcing the role of family in providing support to the elderly. Some of these efforts have been ongoing for almost two decades. For example, in 1996, the standing committee of the national people's congress passed the "Law of the People's Republic of China on the Protection of the Rights and Interests of the Elderly." This law was meant to strengthen the role of the family in caring for elderly people and stated that adult children have an obligation, one that should not be refused, to finance health care, offer residence to, and satisfy other needs of their parents (Woo et al., 2002). Originating in a rural community in the mid-1980s, the family support agreement—a voluntary contract between aging parents and their adult children—encourages the provision of support for elderly parents. Its use has spread throughout rural China, representing a shift away from a social beliefs and expectations toward more formal contracts and obligations for the provision of elderly care (Chou, 2011). In addition, the Chinese government has also implemented new social support programs meant to fill the remaining gaps in elderly care. These include the expansion of health insurance, the development of nursing homes, and the provision of more community-based supports and services (CBSS; M. Wu et al., 2012; N. J. Zhang et al., 2012) for the elderly in China.

CBSS have been developing rapidly in China to satisfy a wide range of situations and needs. CBSS examples include psychological support, regular medical examinations, the development of electronic medical records, legal counseling, grocery delivery, housekeeping, community kitchens, recreation centers, and mutual aid networks (B. Wu, Carter, Goins, & Cheng, 2005; Xu & Chow, 2011). The Chinese government expects that CBSS will supplement family care to satisfy the needs of elderly people. In addition, because institutional care for the elderly is much more expensive and not pervasively accessible in China (Xu & Chow, 2011), CBSS are preferred because they can delay or prevent the need for institutional care. Community-based health services have a long history in China, but they have been one of the most underdeveloped and vulnerable components of the Chinese health system (H. H. Wang, Gusmano, & Cao, 2011). Problems associated with community health care organizations include lack of qualified health professionals, poor infrastructure, and the associated low quality of services, which constrained their capacities to service people and led to the underutilization of community-based health services among the elderly in China (H. H. Wang et al., 2011; T. Zhang & Chen, 2006). Since the health care reforms implemented starting in 2009, the government has established more community medical centers and improved the capacity of existing centers to enhance disease prevention and health promotion (Z. Chen, 2009).

Despite the progress achieved through CBSS, very few studies have examined the development of these services, their role in people's daily lives, or their effects on people's health outcomes. Most related studies solely focus on community-based health services (Z. Li, Hou, Lu, Tang, & Ma, 2012; Wang, Wang et al., 2015), which do not reflect the nonmedical services available in communities. Another study examined the unmet long-term care needs of the elderly in China and factors associated with these needs, but did not evaluate how long-term care impacts the elderly's lives (H. Zhu, 2015). In addition, no study has examined the development and the impact of CBSS over time. More research is needed to explore these changes and associated outcomes.

In this article, we analyze the perceived availability of CBSS among the Chinese elderly and evaluate the impact of perceived CBSS availability on the perceived quality of life of the elderly. Our findings may be of interest to policy makers as they work to identify gaps in CBSS availability, understand the effects of CBSS, and develop strategies for further expansion of CBSS services in China.

Conceptual Framework

This study examines the hypothesis that the perceived availability of CBSS is associated with better perceived quality of life among elderly people in China. This hypothesis is based on the concept that quality of life is predicated by satisfaction with specific life domains (Sirgy, Gao, & Young, 2008). These domains include community, family, work, social life, health, and so forth (Farquhar, 1995; Sirgy et al., 2008; Sirgy, Rahtz, Cicic, & Underwood, 2000). Satisfaction with these life domains depends on the availability and quality of resources and services supporting each life domain.

In the context of the current study on China, the availability of CBSS either provides new access to or improves the quality of appropriate resources that are essential for daily life activities. Such services and support are especially beneficial for elderly people given the likelihood for declined physical health and increased functional impairments (Henning-Smith, 2016). Therefore, we hypothesize that the perceived availability of CBSS is associated with improved perceptions of quality of life.

The perceived availability of support and services in the communities examined in this study have the potential to improve four life domains: *daily supports and services*, *medical supports and services*, *emotional support and social services*, and *legal consulting services*. More specifically, *daily supports and services* contribute to good family well-being by making necessary personal daily care and daily shopping available. Elderly people are more likely to have complicated health conditions and multiple comorbidities, such as chronic diseases. The availability of *medical supports and services* in a community can provide timely access to health services and medical advice, and thereby give rise to a sense of health well-being. Social interactions and social recreation are also important components in an elderly person's life. Such interactions are necessary to lessen the risk of social isolation and to provide companionship for elderly (Henning-Smith, 2016). Thus, the availability of *emotional support and social services* can give rise to improved social experiences among the elderly. Finally, *legal consulting services* provide the elderly with a resource for dealing with legal issues. In some circumstances, legal consulting services can support individuals who are experiencing familial elder abuse, including verbal abuse. Again, this study hypothesizes that the perceived CBSS availability in these four domains will contribute to perceptions of improved quality of life.

Two important assumptions are made in this study. First, if individuals do not perceive access to a service they will not use it. Perceived availability of CBSS is therefore an indication of community knowledge about CBSS (Jing & Chen, 2009). Second, the perception that services and support are available may in and of itself improve perceived quality of life among the elderly. For example, studies indicated that perceived support, defined as one's potential instead of real access to social support is associated with improved psychological and physical health (Uchino, 2009). The perceived support will provide the information that leads a person to believe that he or she is being cared for and loved, esteemed, and a member of a community within which members can help and depend on each other (Cobb, 1976; Nurullah, 2012). These feelings could release stress, reduce depression, or address other psychological problems, which gives rise to improved psychological health (Herrero & Gracia, 2007; Oh, Ozkaya, & LaRose, 2014). Studies in China indicated that the elderly can suffer depression and stress due to various concerns, including medical needs, family support, economic status, and marital status (Sun, 2004; Xie et al., 2010). Perceiving the availability of CBSS in their community may generate a sense of support and esteem that the elderly is being taken care of by the community and a sense of security that the potential concerns and needs of the elderly will be satisfied in a timely and convenient manner. Perceiving such support and services may, therefore, alleviate their stress and depression and improve their psychological health (Herrero & Gracia, 2007). In sum, given the absence of information about actual availability and utilization of services and support, perceived availability is valuable information worthy of study.

Method

This is a longitudinal study using secondary data from three distinct years of previously collected interview data.

Data and Sample

Secondary data from the Chinese Longitudinal Health Longevity Survey (CLHLS) were used for this study (Duke Center for the Study of Aging and Human Development, 2013). This study aims to identify a set of social, behavioral, biological, and environmental risk factors that influence healthy longevity. This survey was collaboratively administered by Duke University and Peking University. Data collection was conducted by Peking University Center for Healthy Aging and Family Studies and China Mainland Information Group. Detail information about this survey, including specific objectives, organizational framework, study design, sample distribution, and contents of the data collected are available in previously published work by Zeng (2004, 2008).

Regarding survey methodology, CLHLS collected data through face-to-face interviews plus several basic physical examinations to investigate various aspects of elderly people and their lives. Data also include demographic and socioeconomic characteristics, family and household characteristics, health conditions, lifestyles, diet, and psychological characteristics of participants. CLHLS researchers randomly selected half of the counties and cities in 22 provinces (out of a total number of 31 provinces). The provinces surveyed have a population of 1.1 billion, which is 85% of the total population in China as of 2010. Data were initially collected in 1998 and included 9,093 respondents 80 years and older. Administered at a third point in 2002, the CLHLS was expanded to include younger elders, aged 65 to 79 in addition to those 80 and older with a total sample of 16,057 (Duke Center for the Study of Aging and Human Development, 2013). In total, the CLHLS survey was conducted at six points in time (1998, 2000, 2002, 2005, 2008, and 2011).¹

In the current study, we used secondary data from the last three waves of data collection, including years 2005, 2008, and 2011. This current study includes panel data for only those individuals who contributed data across all three waves. We started with 15,638 participants who were interviewed in 2005. In 2008's survey, 8,166 of them died or were lost to follow-up. In 2011's survey, additional 3,280 died or were lost to follow-up. In sum, 4,192 individuals contributed data in all 3 years examined in the current study. We excluded individuals with missing values on any variable tested in this study.

Dependent Variable

We use perceived quality of life as the outcome of interest in this study. Information about quality of life was captured by the question "How do you rate your life at present?" To answer this question, respondents were asked to choose one answer from "very good," "good," "fair," "bad," "very bad," or "not able to answer." For the purposes of our study, we constructed a binary indicator for quality of life. It was recoded as "good ('very good' and

¹Note that data collected in 2008 went through 2009. Data collected in 2011 went through 2012. Data from these years are referred to as 2008 and 2011, respectively.

‘good’)) or “bad” (“fair,” “bad,” and “very bad”). This method has been applied in other studies using this data set and studies examining similar outcomes (L. Cheng et al., 2015; Zhou & Qian, 2008).

Independent Variables

CBSS variables.—The CLHLS asked about the perceived availability of eight community supports and services. These included personal daily care services, home medical visits,² psychological support, daily shopping, social and recreation activities, legal consulting services, health education, and neighboring relations. Respondents indicated “Yes” or “No” for the perceived availability of each support or service in their communities. They could also specify other services available in their communities.

In this study, we use three specifications to examine the relationship between perceived CBSS availability and perceived quality of life (the dependent variable of interest). First, we examined each of eight CBSS variables separately to investigate their impact on perceived quality of life. Second, we created a binary variable indicating the perceived availability of any support or service (1 = available, 0 = unavailable). Finally, we aggregated similar supports/services because the perceived availability of similar services and support are highly correlated. Essentially, by grouping similar services together, the model accounts for the role of other services but avoids the collinearity problem that would occur if we added all of the eight individual variables into one model. Based on our conceptual framework and a previous study examining the services and supports available in China’s communities for the elderly (Xu & Chow, 2011), we aggregated similar supports/services to generate four binary CBSS variable categories (*daily supports and services*, *medical supports and services*, *emotional and social services*, and *legal consulting services*) representing a positive response to at least one of the CBSS within that category. Specifically, *daily supports and services* indicate the perceived availability of personal daily care services and/or daily shopping services. *Medical supports and services* indicate the perceived availability of home medical visit services and/or health education services. *Emotional and social services* indicated the perceived availability of psychological support and/or social and recreation activity services and/or neighboring relations support. *Legal consulting services* was examined as a stand-alone CBSS as it did not naturally fit within any of the three categories.

Control variables.—Based on previous studies, numerous demographic, socioeconomic, and health condition variables were included in this study (Yi & Vaupel, 2002; W. Zhang & Liu, 2007; A. Y. Zhang & Lucy, 1998; Zhou & Qian, 2008). Binary variables included gender, race (e.g., Han or Other), smoking status, alcohol consumption, exercise, health insurance, old-age insurance/pension, presence of another insurance, having sufficient financial support for daily expenses, daily care/support from children or other relatives, having any limitations on activities of daily living (ADL), and having any chronic diseases. In addition, the following categorical variables were included: age (e.g., <70, 70-79, 80-89, 90-99, or 100), marital status (e.g., married and live together, married but live separately,

²In the English version questionnaire, this item was labeled as “home visit.” However, we found this item actually indicated a home medical visit after checking the Chinese version of the questionnaire used for the interviews.

divorced or widowed, or never married), residence location (e.g., rural, town, or city), and coresidence status (e.g., living with family, living alone, or living in a nursing home). We also included annual income, a continuous variable.

Analyses

We used descriptive analysis to examine trends in the perceived availability of CBSS among Chinese elderly from 2005 to 2011 and the baseline characteristics of study participants. We also used chi-square analyses and *t* tests to compare the perceived availability of CBSS among groups with different demographic and socioeconomic characteristics, specifically grouping by perceived CBSS or no perceived CBSS.

To evaluate the impact of the perceived CBSS availability on perceived quality of life, we implemented a fixed effects logit model by using self-reported quality of life as the outcome and the perceived CBSS availability as the independent variable of interest. We compared data across 2005, 2008, and 2011. We also included time-variant demographic, socioeconomic, and health condition variables in the model. Compared with cross-sectional analysis and random effects models, this analytic method controls for unobservable time-invariant heterogeneity, generating more robust results. The basic model is as follows:

$$y_{it} = \delta \times S_{it} + \gamma \times \mathbf{X}_{it} + \lambda_i + \beta_t + \varepsilon_{it},$$

where y_{it} is the outcome (self-reported quality of life) for individual i at time t . S_{it} is the variable indicating the perceived CBSS availability. $\mathbf{X}_{it}$ is a vector of time-variant control variables. λ_i is the individual fixed effects and β_t is the time-fixed effects. ε_{it} is the error term.

We used three specifications of the perceived CBSS availability mentioned above to test its effects on quality of life. We first used a binary variable to test the impact of the perceived availability of any CBSS on quality of life. Then, we tested the effects of perceived availability of each CBSS separately. Finally, we used four binary CBSS variable categories aggregating the similar services and supports. All analyses were conducted in STATA version 13, and statistical significance was considered at the alpha level of $p < .05$, $p < .01$, and $p < .001$.

Results

Descriptive Findings and Perceived CBSS Availability Trends

Table 1 presents the trend of the perceived availability of CBSS among elderly people across the three survey points (2005, 2008, and 2011). In general, the data show that there was a significant increase of the perceived CBSS availability in China, although there were slight reductions between 2005 and 2008. By 2011, more than half of the elderly people reported the availability of some type of CBSS. However, the analysis by service type indicates some variance in the perceived availability and growth. In 2011, more than 25% of respondents reported that health education and home medical visits were available in their community. Approximately 15% to 20% of the elderly people said neighboring relations services and

social and recreation activities were available. The availability of legal consulting services was reported by 11.4% of elderly people. The availability of other services and supports were reported by approximately 5% to 6% of respondents.

Table 2 reports the outcome, the demographic, and the socioeconomic characteristics of respondents at baseline (year 2005). We also compare those who reported availability of any CBSS with those who did not perceive any CBSS. Data show that 2,454 (59.8%) elderly people reported their quality of life as good and 1,650 (40.2%) reported their quality of life as bad. People reporting good quality of life also had higher perceived CBSS availability, compared with people reporting a bad quality of life (32.6% vs. 28.1%, $p = .002$).

The perceived availability of the CBSS also varies by demographic and socioeconomic characteristics. Specifically, the perceived availability of the CBSS decreased as the age of respondents increased—Older respondents were less likely to report the perceived availability of CBSS compared with younger respondents. People living in cities or towns were more likely to report availability to CBSS than people living in rural areas. People with health insurance or old-age insurance also reported more CBSS availability. People living in nursing homes and having sufficient supports for daily expenses were also more likely to report CBSS availability.

Multivariate Results

Employing a binary variable indicating the perceived availability of any CBSS, we found the perceived availability of any CBSS positively but insignificantly associated with self-reported quality of life ($\beta = .049$, $p = .426$).

We then tested each CBSS variable separately to look at the individual impact of each CBSS on self-reported quality of life (see Table 3). We found that home medical visits ($\beta = .181$, $p = .03$), psychological support ($\beta = .332$, $p = .02$), social and recreation activities ($\beta = .231$, $p = .02$), and legal consulting services ($\beta = .271$, $p = .02$) were each significantly and positively associated with self-reported quality of life. We also found some demographic and socioeconomic characteristics were significantly related to self-reported quality of life. Compared with living alone or living in a nursing home, living with family was positively associated with self-reported quality of life. Annual income and having sufficient financial support for daily expenses were significantly and positively associated with self-reported quality of life. Drinking alcohol was also associated with higher self-reported quality of life. Finally, having a chronic disease was associated with a lower self-reported quality of life. These demographic and socioeconomic relationships were consistent across all of the eight models.

When examining the four grouped categories of CBSS, only one group (*emotional and social services*) was significantly associated with higher self-reported quality of life ($\beta = .162$, $p = .040$). Similar with the results from separating models, we found demographic and socioeconomic characteristics, including coresidents, drinking alcohol, annual income, having sufficient financial support for daily expenses, and having a chronic disease positively and significantly related to self-reported quality of life. Table 4 represents these results.

Discussion

The rapid growth of the elderly population and the ongoing erosion of traditional elderly care practices have impacted family structure and the traditions for elderly care in China (B. Wu et al., 2005; Xu & Chow, 2011). Increasing numbers of elderly people are living alone without support available from their children (Liu & Guo, 2008; C. W. Wang et al., 2014; Z. Q. Wu et al., 2010; Xie et al., 2010). In response, the Chinese government has established several community-based programs to support elderly people. Although these programs have been developed and implemented rapidly, little is known about their pervasiveness across the relatively large country or their associated impacts on the lives of the elderly.

Longitudinal findings indicate that there was an overall increase of the perceived availability of CBSS in China between 2005 and 2011; however, the perceived availability varied by the type of CBSS. Health education and home medical visits were more commonly reported as available than other services, such as personal daily care services or psychological support. We also found the perceived availability of CBSS varies by the demographic and socioeconomic characteristics of survey participants. For example, older people and people living in rural China were less likely to report the availability of CBSS compared with younger people and people living in cities or towns. This finding may exacerbate the existing inequality in primary care experiences, as indicated in previous research (Wang, Wong et al., 2015). It may be important to consider additional strategies to address these barriers and ensure increased health care accessibility and equity among the elderly in China.

Key findings indicate that the perceived availability of home medical visits, psychological support, social and recreation activities, and legal consulting services are positively associated with perceived quality of life after controlling for demographic, socioeconomic, and health condition characteristics. The positive effect of perceived availability of home medical visits on perceived quality of life reflects the progress of the community-based health services in China. The Chinese government started dedicating more efforts toward strengthening the community health organizations after the outbreak of Severe Acute Respiratory Syndrome (SARS) in 2002. In China's "New Health Care Reform Plan" of 2009, the development of community-based health services was highlighted as one of the five key components of the government's short-term targets for 2009 to 2011. Interventions targeting community health organizations, such as more subsidies from the government, increased investment on infrastructure, and well-trained staff have been implemented rapidly since 2009 (Z. Chen, 2009; Yip et al., 2012). The services associated with these interventions, such as increased home medical visits, will facilitate people's access to health care and potentially improve the health status and perceived life satisfaction among the elderly in China.

The significant impact of psychological support and social and recreation activities on perceived life satisfaction may reflect the needs of interpersonal communication and activities among Chinese elderly. Given the nature of kinship in Chinese society, family is the most important source for social contacts and social relationships (Y. Chen, Hicks, & While, 2014; S. T. Cheng, Lee, Chan, Leung, & Lee, 2009). With the absence of support

from their children, elderly people lose interpersonal interactions and are likely lonely. The perceived availability of emotional and social services like the community psychological support and social and recreational activities help elderly people reconnect with other people. For example, park opera groups and the Peking Opera groups are popular recreational activities among the elderly in China (Xu, Gao, & Yan, 2005). These groups gather elderly people with the same interests and create platforms for communication and interaction, which is supportive for elderly people's daily lives.

The positive effect of legal consulting services should be considered in the context of findings about family conflicts and elder abuse. Recent studies have indicated a prevalence of family conflicts affecting elderly, which has contributed to higher suicide rates among the Chinese elderly (X. Li, Xiao, & Xiao, 2009). These conflicts are often related to intergenerational disputes about property distribution and responsibility of elderly care (B. Chen, 2009). Community legal consulting services may assist the elderly to understand their legal issues and support their claims of legitimate rights, which may ultimately contribute to positive quality of life perceptions. Second, elder abuse has been identified among China's families (Dong, Simon, & Gorbien, 2007; Tang, Wu, Yeung, & Yan, 2009; Yan & Tang, 2003). For example, in a study by Yan and Tang (2003), findings indicated verbal elder abuse among 20% of participants. Elder abuse may impact quality of life via declining functional abilities, progressive dependency, a sense of helplessness, social isolation, and a cycle of worsening stress and psychological decline (Dong, 2005). The perceived availability of legal consulting services provides the elderly with assistance in dealing with abuse issues and protecting their rights.

Given the significant impact of many of the CBSS, but disparate levels of the perceived availability, more work is needed to strengthen these community services and supports in terms of wider availability. First, policies as well as financial and labor support are needed to improve the quality and quantity of CBSS. For community-based health services, although many efforts have been made to strengthen the infrastructure and improve both the skills and the capacity of health care providers, studies indicate slow progress in middle and small cities (Jin & Liu, 2013). In addition, recent studies have indicated that community health centers (CHCs) apply varying service delivery models (H. H. Wang et al., 2013). Specifically, a study by Wang and colleagues found that patients reported better experiences receiving primary care in government-owned and government-managed CHCs, as compared with care received in CHCs managed by hospitals or owned by private and social entities (H. H. Wang et al., 2013). The authors also noted that government-owned and government-managed CHCs are more likely to receive governmental financial support, to have linkages with other health systems, and to receive support from the local government to strengthen their capacity (H. H. Wang et al., 2013). In comparison, it may be difficult for hospital-managed and private-owned CHCs to get support from government and other related agencies, such as the departments of finance and human resources (Liu, 2011; H. H. Wang et al., 2013; K. Zhu, Xie, & Li, 2011). In addition, resources from and collaboration with these agencies are essential for investments in infrastructure and increased numbers of skilled health care providers for these CHCs. Given these recent findings, there may be a relationship between perceived quality of life and access to the various CHC models.

Although this relationship should be explored further, essential data were not available to do so in this current study.

For nonmedical services, Xu et al. (2005) found that services provided at community centers varied greatly in terms of quality and quantity, and generally there was no financial support from the government. Sufficient financial support coupled with a well-trained staff could improve the quality and availability of CBSS. In addition, Wang's study suggested that low willingness and the simplicity of activity types are two main problems of elderly people's social involvement (L. Wang, 2011). Improved communication about available services may encourage more elderly people get involved in CBSS and may be another strategy to improve the impact of CBSS.

This study has several limitations. First, we use panel data to implement a fixed effects logit model, which limited the data to individuals who participated throughout all three points of the study period. As such, although this model improved the internal validity of the study by controlling for the time-invariant unobservable factors that may relate to quality of life, data from these individuals may not be generalizable to the entire population. A second limitation is that the survey data provided information about perceived CBSS availability, but did not indicate whether the respondent used the CBSS. Third, we used a binary variable of quality of life to implement a fixed effects logit model. Although it would be ideal to be able to examine quality of life with more dimensions than a binary variable allows, it is not feasible with a fixed effects model. Although some nuance of the quality of life response is lost in making it binary, this is generally an accepted trade-off given the value of the fixed effects model in examining the study question. Results based on a binary outcome still provide valuable implications about effects of CBSS on elderly people's life, given the scarcity of previous studies.

Finding new ways to provide support and services for elderly people is of particular importance for the Chinese government, which faces a growing aging population, ongoing changes to traditional familial expectations, and increasing rates of chronic conditions that will impact the health and quality of life of the elderly population (Yang et al., 2008; N. J. Zhang et al., 2012). Findings from this study will provide policy makers with information about the general availability and trends of CBSS. Furthermore, insight about which CBSS are related to perceived good quality of life can inform strategies for additional CBSS or interventions to strengthen existing CBSS.

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Biography

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Table 1.

Trends of Perceived CBSS Availability Among Elderly in China: 2005 to 2011.

CBSS variables	2005 (<i>n</i> = 4,104) <i>n</i> (%)	2008 (<i>n</i> = 3,463) <i>n</i> (%)	2011 (<i>n</i> = 3,567) <i>n</i> (%)	<i>p</i>
Perceived availability of any CBSS	1,264 (30.80%)	851 (24.57%)	1,805 (50.60%)	<.001
Average number of CBSS available ^a	0.718 (1.445)	0.572 (1.365)	1.310 (1.776)	<.001
Perceived availability of daily supports and services				
Personal daily care services	129 (3.14%)	98 (2.83%)	154 (4.32%)	<.001
Daily shopping	231 (5.63%)	163 (4.71%)	242 (6.78%)	.005
Perceived availability of medical supports and services				
Home medical visits	425 (10.36%)	234 (6.76%)	933 (26.16%)	<.001
Health education	382 (9.31%)	241 (6.96%)	1,182 (33.14%)	<.001
Perceived availability of emotional and social services				
Psychological support	206 (5.02%)	149 (4.30%)	282 (7.91%)	<.001
Social and recreation activities	458 (11.16%)	335 (9.67%)	529 (14.83%)	<.001
Neighboring relations	819 (19.96%)	551 (15.91%)	878 (24.61%)	<.001
Perceived availability of legal consulting services				
Legal consulting services	284 (6.92%)	195 (5.63%)	407 (11.41%)	<.001

Note. The *p* values examine the differences between the perceived availability of CBSS between 2005 and 2011. Data collected in 2008 went through 2009. Data collected in 2011 went through 2012. CBSS = community-based supports and services.

^aFor average number of CBSS available, we reported average and standard deviation.

Table 2.
Baseline Characteristics of Study Participants and Bivariate Examination of Perceived Availability of CBSS, 2005.

Variables	Full sample (<i>n</i> = 4,104) <i>n</i> (%)	Individuals who perceive availability to any CBSS (<i>n</i> = 1,264) <i>n</i> (%)	Individuals who do not perceive availability of any CBSS (<i>n</i> = 2,840) <i>n</i> (%)	<i>p</i>
Outcome variable				
Good quality of life ^a	2,454 (59.80%)	800 (32.60%)	1,654 (67.40%)	.002
Bad quality of life	1,650 (40.20%)	464 (28.12%)	1,186 (71.88%)	
Demographic and socioeconomic characteristics				
Age				
<70	1,008 (24.56%)	348 (34.52%)	660 (65.48%)	.016
70-79	1,592 (38.79%)	493 (30.97%)	1,099 (69.03%)	
80-89	998 (24.32%)	287 (28.76%)	711 (71.24%)	
90-99	409 (9.97%)	110 (26.89%)	299 (73.11%)	
100	97 (2.36%)	26 (26.80%)	71 (73.20%)	
Race				
Han	3,815 (92.96%)	1,212 (31.77%)	2,603 (68.23%)	<.001
Other	289 (7.04%)	52 (17.99%)	237 (82.01%)	
Gender				
Male	1,914 (46.64%)	597 (31.19%)	1,317 (68.81%)	.611
Female	2,190 (53.36%)	667 (30.46%)	1,523 (69.54%)	
Marital status				
Married/live together	2,060 (50.19%)	661 (32.09%)	1,399 (67.91%)	.122
Married/live separately	110 (2.68%)	33 (30.00%)	77 (70.00%)	
Divorced or widowed	1,898 (46.25%)	555 (29.24%)	1,343 (70.76%)	
Never married	36 (0.88%)	15 (41.67%)	21 (58.33%)	
Residence location				
Live in the city	794 (19.35%)	306 (38.54%)	488 (61.46%)	<.001
Live in the town	805 (19.62%)	288 (35.78%)	517 (64.22%)	
Live in the rural	2,505 (61.04%)	670 (26.75%)	1,835 (73.25%)	
Coresidence status				

Variables	Full sample (<i>n</i> = 4,104) <i>n</i> (%)	Individuals who perceive availability to any CBSS (<i>n</i> = 1,264) <i>n</i> (%)	Individuals who do not perceive availability of any CBSS (<i>n</i> = 2,840) <i>n</i> (%)	<i>p</i>
Live with family	3,502 (85.33%)	1,059 (30.24%)	2,443 (69.76%)	<.001
Live alone	547 (13.33%)	155 (28.34%)	392 (71.66%)	
Live in a nursing home	55 (1.34%)	50 (90.91%)	5 (9.09%)	
Annual income ^b	10,965.55 (23,040.95)	10,195.59 (20,250.39)	11,308.12 (24,175.10)	.153
Sufficient financial support for daily expenses	3,143 (76.58%)	1,035 (32.93%)	2,108 (67.07%)	<.001
Health insurance	1,110 (27.05%)	539 (48.56%)	571 (51.44%)	<.001
Old-age insurance or pension	1,011 (24.63%)	419 (41.44%)	592 (58.56%)	<.001
Other insurance	141 (3.44%)	67 (47.52%)	74 (52.48%)	<.001
Receiving daily care support from children or other relatives	191 (4.65%)	54 (28.27%)	137 (71.73%)	.439
Smoking	1,041 (25.37%)	328 (31.51%)	713 (68.49%)	.566
Alcohol consumption	994 (24.22%)	317 (31.89%)	677 (68.11%)	.392
Exercising regularly	1,524 (37.13%)	539 (35.37%)	985 (64.63%)	<.001
Having ADL limitation	239 (5.82%)	69 (28.87%)	170 (71.13%)	.506
Having any chronic disease	2,595 (63.23%)	821 (31.64%)	1,774 (68.36%)	.127

Note. CBSS = community-based supports and services; ADL = activities of daily living.

^aQuality of life: Good includes respondents' rates of their lives at present as "very good", "good", "bad", "fair", "bad", and "very bad."

^bFor annual income, we present the average and the standard deviation.

Table 3.
Longitudinal Fixed Effects Examination of the Impact of Perceived Individual CBSS Availability on Quality of Life, 2005 to 2011.

Variables	Access to individual CBSS							Neighboring relations
	Personal daily care services	Home medical visits	Psychological support	Daily shopping	Social and recreation activities	Legal consulting services	Health education	
Perceived CBSS availability (reference = no perceived availability)	0.011 (0.172)	0.181 (0.085) *	0.332 (0.133) *	-0.019 (0.124)	0.231 (0.099) *	0.271 (0.113) *	0.094 (0.086)	0.093 (0.072)
Age (compared with <70)								
70-79	-0.137 (0.111)	-0.149 (0.117)	-0.173 (0.113)	-0.148 (0.112)	-0.149 (0.112)	-0.145 (0.114)	-0.174 (0.113)	-0.204 (0.112)
80-89	-0.166 (0.185)	-0.192 (0.185)	-0.222 (0.187)	-0.197 (0.187)	-0.179 (0.186)	-0.204 (0.188)	-0.252 (0.187)	-0.297 (0.186)
90-99	-0.042 (0.267)	-0.108 (0.267)	-0.127 (0.268)	-0.101 (0.268)	-0.103 (0.268)	-0.103 (0.270)	-0.164 (0.269)	-0.231 (0.269)
100	-0.016 (0.431)	-0.017 (0.430)	-0.053 (0.431)	-0.038 (0.432)	-0.066 (0.434)	-0.044 (0.438)	-0.096 (0.437)	-0.169 (0.434)
Marital status (compared with never married)								
Divorced or widowed	-0.254 (0.658)	-0.313 (0.658)	-0.300 (0.653)	-0.230 (0.660)	-0.304 (0.654)	-0.230 (0.670)	-0.262 (0.657)	-0.221 (0.674)
Married but live separately	-0.221 (0.686)	-0.290 (0.686)	-0.307 (0.682)	-0.193 (0.688)	-0.229 (0.682)	-0.222 (0.698)	-0.279 (0.686)	-0.188 (0.703)
Married and live together	-0.507 (0.667)	-0.540 (0.666)	-0.536 (0.662)	-0.452 (0.669)	-0.537 (0.663)	-0.426 (0.679)	-0.464 (0.666)	-0.443 (0.683)
Coresidence (compared with live alone)								
Living in a nursing home	-0.240 (0.403)	-0.261 (0.400)	-0.206 (0.406)	-0.117 (0.404)	-0.187 (0.404)	-0.316 (0.400)	-0.254 (0.399)	-0.262 (0.398)
Living with family	0.327 (0.110) **	0.318 (0.110) **	0.308 (0.110) **	0.337 (0.111) **	0.321 (0.110) **	0.306 (0.112) **	0.330 (0.111) **	0.302 (0.110) **
Annual income (inverse hyperbolic sine transferred)	0.068 (0.019) ***	0.068 (0.019) ***	0.070 (0.019) ***	0.072 (0.019) ***	0.071 (0.019) ***	0.074 (0.020) ***	0.073 (0.019) ***	0.068 (0.019) ***
Having sufficient financial support for daily expenses	0.918 (0.075) ***	0.911 (0.075) ***	0.923 (0.076) ***	0.929 (0.076) ***	0.919 (0.076) ***	0.935 (0.077) ***	0.928 (0.076) ***	0.916 (0.076) ***
Health insurance	-0.117 (0.070)	-0.123 (0.070)	-0.124 (0.071)	-0.107 (0.071)	-0.138 (0.071)	-0.134 (0.072)	-0.122 (0.071)	-0.130 (0.071)
Old-age insurance or pension	0.127 (0.104)	0.119 (0.105)	0.129 (0.105)	0.140 (0.105)	0.137 (0.105)	0.138 (0.106)	0.148 (0.106)	0.157 (0.105)
Other insurance	-0.110 (0.169)	-0.134 (0.169)	-0.172 (0.172)	-0.144 (0.170)	-0.051 (0.170)	-0.099 (0.174)	-0.118 (0.171)	-0.030 (0.171)
Getting daily care support from children or other relatives	-0.017 (0.108)	-0.027 (0.108)	-0.007 (0.108)	0.021 (0.108)	-0.001 (0.108)	0.007 (0.109)	-0.037 (0.108)	-0.020 (0.130)

Variables	Access to individual CBSS							
	Personal daily care services	Home medical visits	Psychological support	Daily shopping	Social and recreation activities	Legal consulting services	Health education	Neighboring relations
Smoking (compared with no smoking)	-0.021 (0.114)	0.012 (0.114)	-0.004 (0.115)	-0.002 (0.114)	-0.016 (0.115)	0.031 (0.115)	0.034 (0.115)	0.004 (0.398)
Alcohol consumption (compared with no drinking)	0.225 (0.099) *	0.233 (0.099) *	0.220 (0.099) *	0.223 (0.100) *	0.228 (0.100) *	0.211 (0.100) *	0.219 (0.100) *	0.217 (0.100) *
Exercising regularly (compared with no regular exercise)	0.0002 (0.068)	0.006 (0.068)	0.008 (0.068)	0.010 (0.068)	0.010 (0.068)	0.006 (0.069)	0.002 (0.068)	0.005 (0.068)
Having any ADL limitation (compared with no limitation)	-0.158 (0.128)	-0.163 (0.128)	-0.176 (0.129)	-0.197 (0.130)	-0.161 (0.128)	-0.185 (0.131)	-0.150 (0.130)	-0.145 (0.130)
Having any chronic disease (compared with no disease)	-0.297 (0.066) ***	-0.286 (0.066) ***	-0.299 (0.067) ***	-0.300 (0.067) ***	-0.278 (0.067) ***	-0.281 (0.067) ***	-0.274 (0.067) ***	-0.291 (0.067) ***
Year (compared with 2005)								
2008	-0.056 (0.075)	-0.045 (0.075)	-0.054 (0.075)	-0.077 (0.075)	-0.063 (0.075)	-0.047 (0.076)	-0.044 (0.076)	-0.035 (0.076)
2011	-0.008 (0.103)	-0.015 (0.103)	-0.005 (0.104)	-0.033 (0.104)	-0.018 (0.104)	-0.005 (0.105)	0.001 (0.106)	0.025 (0.104)
<i>n</i>	9,441	9,447	9,357	9,318	9,336	9,156	9,258	9,285

Note. The table contains the β coefficient (standard error) from logit models. Data collected in 2008 went through the first month of 2009, Data collected in 2011 went through the first month of 2012. CBSS = community-based supports and services; ADL = activities of daily living.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4.

Longitudinal Fixed Effects Examination of the Impact of Perceived CBSS Availability on Self-Reported Quality of Life, 2005 to 2011.

Variables	β coefficient (standard error) from logit model
Daily supports and services	-.111 (0.125)
Medical supports and services	-.004 (0.091)
Emotional supports and services	.162 (0.081) *
Legal consulting services	.208 (0.129)
Age (compared with <70)	
70-79	-.136 (0.114)
80-89	-.190 (0.188)
90-99	-.074 (0.271)
100	.008 (0.439)
Marital status (compared with never married)	
Divorced or widowed	-.257 (0.671)
Married but live separately	-.247 (0.699)
Married and live together	-.464 (0.680)
Coresidence (compared with live alone)	
Live in an institution	-.307 (0.403)
Live with family	.308 (0.112) **
Annual income (inverse hyperbolic sine transferred)	.072 (0.020) ***
Having sufficient financial support for daily expenses	.932 (0.077) ***
Health insurance	-.144 (0.072) *
Old-age insurance or pension	.155 (0.106)
Other insurance	-.110 (0.175)
Getting daily care support from children or other relatives	-.001 (0.109)
Smoking (compared with no smoking)	.026 (0.116)
Alcohol consumption (compared with no drinking)	.218 (0.101) *
Exercising regularly (compared with no regular exercise)	.010 (0.069)
Having any ADL limitation (compared with no limitation)	-.173 (0.131)
Having any chronic disease (compared with no disease)	-.289 (0.068) ***
Year (compared with 2005)	
2008	-.034 (0.077)
2011	-.008 (0.107)
<i>n</i>	9,117

Note. CBSS were grouped into four categories: Daily supports and services indicate the availability of personal daily care services and/or daily shopping services. Medical supports and services indicate the availability of home medical visit services and/or health education services. Emotional and social services indicated the availability of psychological support and/or social and recreation activity services and/or neighboring relations support. Legal consulting services was examined as a stand-alone CBSS. Data collected in 2008 went through 2009. Data collected in 2011 went through 2012. CBSS = community-based supports and services; ADL = activities of daily living.

* $p < .05$.

**
 $p < .01$.

 $p < .001$.

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