“I Need the Company of My Peers”: A Mixed-method Study Among Community-dwelling Elderly in China

Running Title: I Need the Company of My Peers

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Abstract

Background: To study the importance of peers in Chinese older adults' lives and explore their peer interaction perceptions.

Methods: A mixed-methods study was undertaken among the community-dwelling elderly in Chongqing, China. First, a self-administered nomination survey was carried out (n=340) to detect current peer network features. Second, we conducted semi-structured interviews (n=19) to explore the experience and perspectives on peer interaction of the elderly.

Results: 67.10% of social network members who have the most contact with participants were peers, and 85.47% of these peers were within the age difference of 10 years old compared with participants. In the interview, three themes were revealed: motivation, preference and barriers, and impact of peer interaction on the individual's health.

Conclusions: Peers make up the vast majority of Chinese older people's social networks. Older people's preference for the company of peers deserves greater attention and community support to improve their health and well-being.

Introduction

The global population aged 60 or above amounted to 962 million, which is 13% of the total, and is still growing at a rate of 3% per year (Cillóniz, Rodríguez-Hurtado, & Torres, 2018). This demographic shifting has led to a significant issue urging for a comprehensive public health action across multiple sectors for the elderly population. Thus, achieving "healthy aging" and "successful aging" have become important public health priorities in light of the rapidly growing aging population worldwide. Successful aging is not confined to physiological and psychological health as it includes social domains such as social interaction that directly affect the health and well-being of older adults (WHO, 2017). Nowadays, concern for social well-being among older adults is on the rise.

Social interactions and social relationships, which are indispensable in human life, have been acknowledged as essential prerequisites for successful aging with far-reaching and cumulative effects on health over the life course (Antonucci, Ajrouch, & Birditt, 2014; Ten Bruggencate, Luijkx, & Sturm, 2019). So far, there are extensive literature on the social interactions of older adults. Generally speaking, there are two kinds of generalized relationships for the elder (Kadushin, 2012). The first role within the social network is to act as kinship ties with family members, partners, adult children, and relatives. The second type of role includes less structured non-kin relationships, such as friends, neighbors, and formal caregivers. Older people regard social relationships and social contacts with both kin and non-kin as important factors to their quality of life (Gallardo-Peralta, de Roda, Ángeles Molina-Martínez, & Schettini del Moral, 2018). However, among the various types of social partners, what role do peers play in older people's social life?

Peer, according to the Cambridge dictionary, refers to a person who is the same age or has the same social position or the same abilities as other people in a group. It is highlighted that “peer” has several definitions and meanings under different social situations and ethnics. It should be noticed that peers may or may not be considered as friends because peer networks may be comprised of friends, extended family members, and acquaintances of similar age. We noted that the vast majority of researches on peer interaction and relationship have focused on children or adolescents up till now. A growing body of evidence suggests that through interactions with peers, children learn social and problem-solving skills and rules for appropriate behaviors under different situations, which may influence their adaptation in later years as well as cultivate the feelings of security and belongingness(Faircloth & Hamm, 2011; Furman & Rose, 2015; Lin, Justice, Paul, & Mashburn, 2016). However, relatively little research has been carried out on the peer interaction of the elderly, who are highly susceptible to social isolation and loneliness due to their decreasing social circle and increasing health restrictions. Only an anthropological study of older people found that peer relationships are vitally important in the aging process within a Western social context(Hockey, 1994). Besides, a few studies suggest that peers play an irreplaceable role in preventing and treating chronic diseases for older adults(Cooper, Schofield, Klein, Smith, & Jehu, 2017; Shen, Edwards, Courtney, McDowell, & Wu, 2012).

Meanwhile, in China, increasing population of older adults age at home and rely primarily on intergenerational assistance, which sits at the core of the Chinese cultural value of filial piety(Ng, Tey, & Asadullah, 2017). However, the fact is that most of the time, adult children bear the financial burden and have to go out for work, leaving less time to accompany the elderly(Xie, Ma, Wu, Zhang, Zhang, & Tan, 2020). In this sociocultural context, what roles and positions peers have within an older individual’s social networks is worth studying. Moreover, unlike in Western countries, Chinese were deeply influenced by Confucian culture, which may influence the pattern, perceptions and experience of peer interaction among Chinese elderly. Therefore, to address the current research gaps on peer interaction for the elderly, especially under traditional Chinese culture, this study set out to obtain data and explore the possible answers for the following research questions: (1) What is the current situation of social network of peers for the Chinese community-dwelling elderly? (2) What are such networks’ characteristics and the nature of the interaction between older adults and their peers? (3) What are the experience and perceptions of Chinese older people towards interacting with their peers? The findings obtained in this study were important in enhancing social health for the community-dwelling elderly within the Confucian culture, promoting all-around healthcare and successful aging.

Methods

We used a mixed-methods explanatory sequential research design that involved both quantitative and qualitative methods to answer our research questions. The study employed survey data as a priori to provide a comprehensive description of the current situation of peer network features among older adults. The qualitative part of the study was then conducted to gain more in-depth insight into the experience and perceptions of peer interaction based on the quantitative results(Creswell & Clark, 2011).

Quantitative Methods

Participants and procedure

This cross-sectional study was conducted in the main urban zone of Chongqing municipality, China from July to September 2020. The inclusion criteria were: (1) aged 65 years or older; (2) having sufficient cognitive abilities; (3) agreeing to voluntarily participate in the study. This is primarily an exploratory and descriptive cross-sectional study, therefore, a formal sample size calculation is not required (Kulu, Khajeh, Ghamarnejad et al., 2020). In total, a convenience sample of 380 older adults who met the inclusion criteria were recruited via fliers posted at communities and by word of mouth. Before starting the survey, those who agreed to participate were asked to sign an informed consent form. The Mini-mental State Examination (MMSE) was used as a screening instrument to determine whether the participants have cognitive impairments (Lanza, Sejunaite, Steindel, Scholz, & Riepe, 2020). Participants with insufficient language skills or withdrew midway were excluded.

The questionnaire started with primary socio-demographic questions, including age, gender, education, living status, socioeconomic status, etc. Then the social network characteristics of the elderly were investigated using the Social Network List (SNL) method (Hirsch, 1979; LeBlanc, 2018; Valente, 2010) with minor modifications. The instrument is openly available under an open access license. Instead of listing the closest relationships, we asked the participants to name at most 5 individuals who they had the most contact with in the last three months. That means those persons having the most contacts with participants were listed in the first place of the social network list, while those who have relatively fewer connections were named from the second to the fifth place accordingly. To understand these social ties, additional questions were asked, including the size of the network, geographic proximity, closeness, role, frequency of contact, duration of the relationship, reciprocity, and whether to seek health-related help from him/her. (Supplement 1)

Statistical analysis

Epidata 3.0 was used for double data entry and system logic error detection. Statistical analysis for the quantitative data was performed using IBM Statistical Package for Social Sciences (SPSS), version 23.0. Descriptive statistics were calculated using means and standard deviations, frequencies, and percentages as appropriate.

Qualitative Methods

Data collection and analysis

This was an explorative qualitative research study based on face-to-face interviews among the elderly who met the inclusion criterion described above. Participants were recruited through posters or community organization and were purposely selected based on their socio-demographic characteristics to enlarge the diversity.

Before the interview, we asked participants to sign an informed consent form if they were reluctant to participate in the study. No relationship with participants was established prior to the interviews, and the researchers' personal goals or reasons for conducting were not revealed to participants. Interviews were conducted by a female PhD candidate, who had received systematic training on qualitative methodology. None of the researchers had prior bias or assumptions related to the research topic. The semi-structured interview guide (Supplement 2) was developed by the project team through discussions and was modified and determined after three pilot interviews. Each interview lasted approximately 30-60 minutes and took place in a quiet location, either the participants' home or a community consulting room. No one else was present except the participants and the researchers. Handwritten field notes were made throughout. Data collection ended when a saturation point was reached. Besides, all interviews were audiotaped, and interviewers also recorded their observations during interviews for the following analysis.

We transcribed the data by carefully listening to the audio recording of the interviews. The transcripts were analyzed using inductive thematic content analysis manually (Burnard, Gill, Stewart, Treasure, & Chadwick, 2008). Two investigators separately coded the transcripts of all the interviews, followed with a discussion about any discrepant data, and reached an agreement on the final coding structure to address the potential bias. The codes were then systematically reviewed to obtain an overall understanding of participants' views. After various stages of identifying and linking ideas, and thorough discussions within the research team, the codes were then grouped together to delineate themes and subthemes according to content similarity. The entire procedure was supervised by an independent expert with considerable experience in qualitative research and the results were agreed upon by all authors.

Trustworthiness

Several methods were used to ensure the credibility, transferability, dependability and confirmability of the study. Credibility was supported by comparing audio-recorded and written verbatim versions of the interviews to ensure completeness and accuracy of data. Transferability was supported through data saturation, purposeful sampling, and rich use of quotations from participants. Dependability was enhanced by maintaining an audit trail and clearly documenting the research process. In order to approve the confirmability, peer debriefing among the research team was done throughout the analysis. Reporting adhered to consolidated criteria for reporting qualitative research (COREQ) (Tong, Sainsbury, & Craig, 2007) and checklist is shown in Supplement 3.

Results

Quantitative findings

Social network features among the community-dwelling elderly

A total of 380 participants was provided with a self-administered questionnaire, and 358 of them returned the questionnaire (return rate = 94.21%). After excluding incomplete questionnaires, there were 340 valid questionnaires for further statistical analysis (valid response rate = 89.47%). The respondents' age

ranged from 65 to 98 years with mean age of 75.6 years (SD = 7.7). Other demographic and characteristic data of the participants, including gender, level of education, marital status, among others, were shown in table 1.

According to the 340 valid questionnaires, 1067 persons were listed in the social network based on the time they spent with the participant in the last three months, though 12 questionnaires left a blank as the respondents claimed to have no social connections with others. We counted the roles of each listed person from first to fifth place separately. As shown in Figure 1, spouses occupy the highest proportion in and only in the first place, adult children mainly distribute in the first and second groups, while friends and neighbors have relatively high proportions across all places.

Peer network features among community-dwelling elderly

To figure out the specific proportions of peers in the elderly's social network, we classified the listed persons into six categories: spouses, the parental generation, generation of children, grandchildren's generation, peers (including friends, neighbors, previous colleagues, previous schoolmate, siblings and acquaintances) and others. The proportion of each category was presented in Figure 2. Overall, 67.10% of all people listed in social networks who have the most contact with the participants are their peers, which is significantly higher than the proportion of spouses (10.31%) and children (18.46%) of the elderly. Among the 717 peers listed in the survey, neighbors accounted for the highest proportion of 32.15%, followed by friends (19.87%) and previous colleges (7.69%).

In the final part of the quantitative analysis, we analyzed the characteristic of listed peers and the relevant detailed information about peer relationship features (Table 2). It seems that older people tend to engage with same-sex peers, as the majority (87.45%) of peers listed in the network are same-sex as participants. Besides, we calculated the differences in age between peers listed in social networks and participants. Strikingly, 57.44% of the 717 listed peers have the age differences within five years of age from the corresponding participants, and 85.47% of them are within ten years of age. Further, the majority (93.31%) of peer relationships have been established for more than three years, indicating that years known may be an essential influence factor for peer relationship among older adults.

Contact frequency and interaction type are important in maintaining close social relationships(LeBlanc, 2018). Among listed peer members, the frequency of interaction was predominantly daily (66.11%) and at least once a week (18.55%). The most common means of interaction was contacting in person (84.24%), followed by communicating on the telephone (7.81%) or through WeChat (7.95%). Besides, most (70.01%) relationships with peers are claimed to be somewhat close, with 20.08% of peers to be the most intimate, 9.90% not close. It is also apparent from table 2 that 89.96% of peers with whom the participants have most contact lived within an hour's drive.

Qualitative findings

Participants' Profile

Nineteen older adults participated in the semi-structured interview without refusal or dropout. Table 1 presented the demographic characteristics of the interviewed persons. The participants ranged in age from 65 to 92 years (mean age = 77.8, SD = 8.07). Approximately half of the participants were widowed. 31.58% of the participants lived alone. Three key overarching themes were identified from the interviews as described below: perceived motivation for peer interactions, preference and perceived barriers on peer interaction, perceived impact on health by peer interaction. Participants were coded 'P' + an assigned number for a quotation.

The perceived motivation for peer interactions

Internal driving forces

Motivation is the starting point for peer-to-peer socialization, which consists of two categories: internal and external driving forces. According to what the participants said, we divided the internal driving forces into three sub-categories: fear of loneliness, fear of boredom, and missing for the peers.

The primary motivation for participants seeking peer interactions was the fear of loneliness. Loneliness is common at all stages of life, but many participants described that their loneliness increases with age. *"(sigh)I used to have many colleagues and friends, but now I can't walk for a long time and don't go out to play with them anymore. Everyone is saying that people are lonely when they grow old. Sure, it is. Some people about my age have passed away, some have become sick, and some moved far away to live with their children. Once people can't walk, there would be no friends..." (Female, P4)*

At the same time, participants also stated that they tend to play with peers because it helps to fill in their spare time, otherwise they would get very bored. As one interviewee said, *"It seemed like time went by faster when I was hanging out with my peer friends, chatting and joking with them. Usually, if I feel bored, I would go downstairs to run into my peer friends and play with them." (Female, P16)*

Another internal driving force for the elderly's peer interaction was that they miss their peer friends very much. Participants expected to "keep in touch" with familiar peer friends or previous colleagues and share their current life events. One of the participants stated, *"I have only been to Chongqing for two years and haven't made many new friends...I have been quite familiar with people about my age in rural areas and don't want to come here...I want to go back to my hometown for some familiar ones and play with them..." (Female, P11)*

External driving forces

Apart from internal driving forces, many external environment factors could also drive the elderly to interact with peers, such as shared interactive opportunities and family support.

Most interviewees started their relationships with peers because they frequently have opportunities to interact with each other due to their shared hobbies and interests, co-working experience, and geopolitical proximity. *"I didn't know these peers at first. I simply want to stay healthy and stay intact. When I routinely*

do tai-chi exercises with these peers, I gradually get familiar with them and make friends with them.” (Male, P6)

Another external factor that may drive older adults to interact with peers was family support. The supportive attitude and behavior of important family members will serve as the elderly’s motivation for peer interactions. *“I now play mahjong with peers every day... Because my spouse passed away in May this year. My child has to work and has no time to accompany me. Therefore, they asked me to go outside to make a few peer friends and take part in some activities with them, such as mahjong or something else.” (Male, P19)*

Preference and perceived barriers to peer interaction

Preference for interactions with peers

All participants stated that peer interaction is essential for them, and nearly three-fourth (14/19) of them showed a preference to get involved with peers rather than their adult children. *“Generally speaking, I don’t like playing with people who are much younger or older than me. I’d like to play with people who are basically about my age. Whenever I meet with my peer friends, we have a lot to talk about, for instance, talking about going somewhere to play together next time. However, I don’t have much to talk with my child, and if I call him out to play together, he will simply refuse.” (Female, P2)*

Some individuals even denied their children’s invitation to relocate to their children’s community or city and live together because that may sacrifice their peer interactions with familiar peers. *“I know they (adult children) worry about me, but I don’t want to leave here to live with them. Their living environment is better, and the house is bigger than mine, but I know no people around their house. Instead, I’m familiar with all the friends of the same age here and have been with them for many years.” (Female, P16)*

Perceived barriers of peer interaction

Despite the importance of peer interaction for the elderly, there are still a lot of perceived barriers in reality. “It hard to build a new friendship with peers in old age” was frequently cited as the main barriers to the older people. *“A lot of peers like to play cards, but I don’t like it. It makes me uncomfortable sitting all the time. I used to go out for walks with Chen XX and Ma XX, but now Chen XX has a disease and was too thin and frail to go out. Ma XX moved to another place, and I was unable to see him. Also, there are still some people of my age who like to go out and sit on the side of the road to sunbathe, sit and drink tea, but I know very few of them.” (Male, P1)*

Besides, “It’s hard to build solid peer friendship in old age” was also a commonly reported constraint on peer interaction. For many, there was a perception that most peers’ relationship was not as deep as they want. *“I feel like I have a deeper and more intimate relationship with my former peer friends. For example, although I left my hometown for Chongqing, my friends in my hometown will still try their best to help me, and some of them even spend their own money to do things for me. I don’t think my current peer friends*

have that deep relationship with me. They are all ok on the surface, and there are no conflicts in getting along. However, few friends are willing to help and close to me as friends in my hometown.” (Male, P19)

The impact of peer interaction on the individual’ health

Perceived promotion of psychological health

The perceived impact of peer interaction on health includes improved psychological health and improved physical condition. The participants frequently mentioned that they feel pleasure and comfortable with diminished negative emotions after having a good time with their peers. *“After my spouse passed away, I always walked with my peer downstairs in the community. They persuaded me and comforted me—Don’t be so sad, please! You have cared for him for so long, and there was no pity. Each time they persuaded me, I felt much better and not that sad anymore.” (Female, P18)* The interaction with peers was regarded as a leading source of happiness and subjective well-being, which will promote their psychological health, *“Everyone sits and chats together every day, and there is no contradiction between us. If you want to say anything, just say that without the necessity to worry about something else. Of course, we feel happy.” (Male, P17)*

Perceived promotion of physical health

What’s more, participants stated that peer interaction provides essential benefits to their physical health. The elderly mentioned that through communicating with peers, they exchanged information about health problems and healthy life style, resulting in improved health-related awareness and behaviors. *“Peer interaction is very important, and communication is good for us to keep healthy. For example, we usually talk about diseases everyone has and how to treat and prevent it. Sometimes we discuss how to stay healthy and live a happy life in old age.” (Male, P13)* *“After the square dance with peers every day, I feel extremely relaxed and get my body stretched. Then I go home and take a bath. It makes me sleep soundly.” (Female, P9)*

Discussion

This study investigated the social network features of the community-dwelling elderly and found that peers account for a large proportion of the social networks of the Chinese elderly. As an attempt to explain this phenomenon, the qualitative research method was employed to provide an in-depth understanding of the experience and perceptions of the elderly in terms of peer interaction. The interview results showed internal and external motivations for peer interactions among the community-dwelling elderly. Older adults prefer to interact with their peers and show a strong desire for their peers’ company, but they feel hard to build a new and solid relationship. What’s more, the elderly perceived improved psychological health and physical condition through peer interaction.

As regards the quantitative data, it was highlighted that 67.1% of the frequently contacted social network members are peers. In other words, the peers were more central in the multiplex social network of older

adults than we expected. In the social network members' analysis, six social ties were classified as "peers" including most friends, neighbors, previous colleagues, schoolmates, siblings, and acquaintances. According to the questionnaire survey, 85.47% "peers" were within the age difference of 10 years compared with the corresponding participants, which demonstrated the preference for age discrepancies among the older adults. Meanwhile, results showed that 87.45% of peers listed in the network are same-sex as participants. On the one hand, this unique phenomenon in China was perhaps influenced by Chinese traditional moral notions, where women were not encouraged to communicate much with men in the old days(Wang, 2015). To reduce unfriendly gossips, older adults tend to avoid interactions with opposite-sex peers. On the other hand, there are inevitably gender differences in the cultivation of hobbies in China, which led to a tendency to interact with peers of the same sex due to shared hobbies.

The most prominent finding from the qualitative analysis is that many interviewees showed a strong social preference for their peers, consistent with our questionnaire results that peers accounted for 67.1% of Chinese older people's listed social network members. Such preference for peers may be attributed to the motivation driven by the internal and external driving factors summarized in our analysis. We found that loneliness, one of the most complained perceptions by the elderly(Bajpai, 2015), is the primary internal driving force of peer interaction for older people, which is different from the younger generation as their motivations for peer relationship are primarily enjoyment and parental requirement(Furman & Rose, 2015; Ojanen, Sijtsema, Hawley, & Little, 2010). Family support from spouse and children also serves as a vital external driving force for peer interactions. These findings will help us to better understand the significance and particularity of peers in older people's social lives. Nevertheless, the preference for peers cannot be applied to all people as some might put particular emphasis on characteristics such as personality or education level when building relationships with others.

"Feeling hard to build new and solid peer relationships" was identified as the major barrier from the qualitative study. Driven by both internal and external forces, older people are motivated to build new peer relationship due to changes such as moving to unfamiliar environment or alteration of social networks. However, it could be challenging for them to build deep relationship without the shared experience and sufficient time, which are vital factors to assess and understand the current status of a relationship, including cognition, emotion, and quality(Furman & Rose, 2015). This was reflected indirectly in our quantitative analysis, as indicated by the results that most peers (93.31%) listed by the participants have been known for more than three years, while those who have been known less than three years only account for 6.69%. To eliminate the perceived obstacles, family members and social workers could help the elderly build confidence and encourage them to take part in activities with peers, such as square dancing and mahjong, which are of widespread popularity in Chinese social context and proven to enhance social interactions(Liu, Willis, Wu, Fulbrook, Shi, & Johnson, 2019).

Another interesting finding is that most older adults (84.24%) tend to communicate with peers in person, which is consistent with the report of Knop(Knop, Öncü, Penzel et al., 2016) that face-to-face contact is different and preferable to online communication among the elderly. A possible explanation for the phenomenon is that older people are not proficient in using mobile phones or social media. It was

previously reported that that many older adults suffer from functional limitations, such as limited cognitive and perceptual abilities, which stop them from using technology in a comparable way to younger adults(Leist, 2013). This is supported by the fact that as of June 2015, only 1.7% of Chinese Internet users were 60 years or older(Guo, 2017). These studies illustrated that the lack of Internet access or social media literacy might hinder a large number of older adults from communicating with peers in distance and therefore face-to-face interaction is preferred. Hence, future works to develop older adults' media literacy are desirable to facilitate peer interaction and keep good social health.

Social support from family members and friends can positively affect older people's motivation for physical activities(Resnick, Orwig, Magaziner, & Wynne, 2002; Sharifian, Sol, Zahodne, & Antonucci, 2022). Our study illustrated the crucial roles of peers in physical and psychological health promotion. Many participants emphasized that contacting with peers was particularly helpful, as their health-related awareness and life style were improved through mutual communication, supervision, and encouragement, which is accordance with previous studies that social relationships can affect health behavior through peer effects (e.g., role models)(Burton, Farrier, Hill, Codde, Airey, & Hill, 2018; Xu, Sun, Zhu et al., 2019). However, our research only investigated self-perceived health, whether the objective physical and psychological health of the elderly were improved by peer interaction was not sure. Therefore, large-scale longitudinal studies are necessary to explore the relationship between peer interaction and objective health outcomes of older adults.

Strengths and Limitations

In our study, both quantitative and qualitative measures were employed to enrich the data and a number of variables of subjects, including age, gender, living situation, among others, were concerned during analysis. Nevertheless, it should be emphasized that limitations do exist. One of the limitations is that the data was collected from one city in Southwestern China and the sample may not be representative of all areas in mainland China. Thus, expansion of the range of participants in the questionnaire survey is necessary for generating a more comprehensive and comparable conclusion. Another limitation is that in the qualitative study, we mainly recruited and analyzed general perceptions of the elderly from ordinary community on peer interaction. Further studies should pay more attention to the special groups, including the solitary, the widowed, and the disabled, for a more in-depth and comprehensive understanding.

Conclusion And Implications

The quantitative survey highlighted the importance of peers in older adults' social life and the qualitative interviews further revealed their motivation, preference, perceived barriers, and perceived influence on health related to peer interaction. At a time when successful aging and healthy aging are becoming increasingly important to the society, peer-to-peer interactions among older people may have an important role to play in promoting health and deserve more scientific attention and more community support. Meanwhile, culture-specific findings should be appropriately taken into consideration by health care providers in competent care and intervention programs. Further investigation is required to develop

valid strategies for the elderly to satisfy their need for peer interaction, to stay healthy, to improve quality of life, and to enhance their subjective well-being.

Declarations

Ethics approval and consent to participate The study protocol had been reviewed and approved by the ethical committees of Army Medical University, China [Reference No.2020-013-02]. All participants signed an informed consent form prior to participation.

Consent for publication Not applicable.

Availability of data and materials The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicting Interests The authors declare that there is no conflict of interest.

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Authors' contributions YL contributed to the conception and design of the study. JF, JH, YH, SL, ZZ, DK and JT participated in the collection and interpretation of data. JF and JH analyzed the data, and contributed to writing and editing the final manuscript. All authors read and approved the final manuscript.

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Tables

Table 1 Demographic characteristics of the study participants (n=340)

Variables	Categories	Survey participants	Interview participants
		n (Percent, %)	n (Percent, %)
Sex	Male	135 (39.71)	7 (36.84)
	Female	205 (60.29)	12 (63.16)
Age range(yrs)	65-74	169 (49.71)	6 (31.58)
	75-84	116 (34.12)	9 (47.37)
	≥85	55 (16.18)	4 (21.05)
Nation	Han ethnicity	333 (97.94)	19 (100.00)
	Ethnic minority	7 (2.06)	0 (0.00)
Education level	Primary school and below	178 (52.35)	5 (26.32)
	Secondary school	98 (28.82)	8 (42.11)
	Senior School or Technical Secondary School	41 (12.06)	3 (15.79)
	University and above	23 (6.76)	3 (15.79)
Hukou	Rural	53 (15.59)	18 (94.74)
	Urban	287 (84.41)	1 (5.26)
Living condition	Living with spouse	124 (36.47)	8 (52.11)
	Living alone	87 (25.59)	6 (31.58)
	Living with children/grandchildren	112 (32.94)	4 (21.05)
	Living with spouse and children	17 (5.00)	1 (5.26)
Marital status	Married	148 (43.53)	9 (47.37)
	Unmarried	2 (0.59)	0 (0.00)
	Widowed	181 (53.24)	10 (52.63)
	Divorced	9 (2.65)	0(0.00)
Average income monthly per capita	< ¥1000	65 (19.12)	1 (5.26)
	¥1000-¥2999	101 (29.71)	6 (31.58)
	¥3000-¥4999	139 (40.88)	7 (36.84)
	≥ ¥5000	35 (10.29)	5 (26.32)
Religion	None	297 (87.35)	17 (89.47)

	Buddhist	25 (7.35)	1 (5.26)
	Christianity	8 (2.35)	1 (5.26)
	Others	10 (2.94)	0 (0.00)
Self-rated health	Very good	45 (13.24)	1 (5.26)
	Good	86 (25.29)	5 (26.32)
	Neither poor nor good	137 (40.29)	10 (52.63)
	Poor	58 (17.06)	0 (0.00)
	Very poor	14 (4.12)	3 (15.79)

Table 2 Descriptive statistics of peer network features (n=717)

Variables	Categories	Cases	Percentage[%]
Whether have same gender as the participant	Yes	627	87.45%
	No	90	12.55%
Age gap between subjects	0-5 yrs	376	57.44%
	6-10 yrs	201	28.03%
	11-15 yrs	88	12.27%
	16-20 yrs	17	2.37%
	21-25 yrs	14	1.95%
	26-30 yrs	17	2.37%
	≥31 yrs	4	0.56%
Years known	≤3 yrs	48	6.69%
	≥3 yrs	629	93.31%
Closeness	Being the closest	144	20.08
	Somewhat close	502	70.01
	Not close	71	9.90
Interaction type	In person	604	84.24
	Phone or text message	56	7.81
	Wechat	57	7.95
Frequency of interaction	Daily	474	66.11
	Once per week or more often	133	18.55
	Once per month or more often	73	10.18
	Once per year or more often	37	5.16
Reciprocity	Yes	539	75.17
	No	178	24.83
Live within hour	Yes	645	89.96
	No	72	10.04

Figures

Figure 1

Roles of social network members for community-dwelling elderly

* G. is short for generation.

Figure 2

The constitution of social network members for the elderly

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