BMJ Open

Utilisation willingness for institutional care by the elderly: a comparative study of empty nesters and non-empty nesters in Shandong, China

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ABSTRACT

Introduction Institutional care has been strongly promoted in China to meet seniors' long-term care needs. Empty-nest elderly, in comparison with their counterparts, have less social support and fewer caring networks. This study aimed to compare the utilisation willingness for institutional care and its predictors between empty-nest and non-empty-nest seniors.

Methods A total of 3923 seniors were included in the analysis. Binary logistic regression models were used to understand the association between the living arrangements of the elderly households and willingness for institutional care and to identify the predictors of the utilisation willingness for institutional care among empty nesters and non-empty nesters.

Results Our study found that approximately 8.5% of the seniors had a willingness for institutional care in Shandong, China. Empty-nest singles (OR 5.301; 95% CI 2.838 to 9.904) and empty-nest couples (OR 1.547; 95% CI 1.135 to 2.107) were found to be more willing to receive institutional care. Our results also showed that residence was a key determinant for institutionalisation willingness in empty-nest and non-empty-nest elderly. Among empty-nest singles, psychological stress was a positive determinant for institutional care. Factors, including education attainment, relationship with adult children, household income and per capita living space, were determinants for empty-nest couple willingness for institutionalisation. Age, number of children and self-reported health status were found to be associated factors for willingness among non-empty nesters.

Conclusions The government should pay more attention to institutional care in rural areas where there is still a gap in elder care compared with that in urban areas. Targeted policies should be made for different types of seniors to offer appropriate institutional care.

Strengths and limitations of this study

► A large sample of 3923 participants based on a community survey provided a real profile of willingness for institutional care in Chinese seniors.
► There might be a possible recall bias for most questionnaire data, which is a limitation of this study.
► The cross-sectional study design precludes any causal interpretation.

which accounted for 15.5% of the total population.[2] It has been estimated that China, with 98.3 million old people aged 80 or over in 2050, will still be one of the countries that has the greatest numbers of oldest-to-old people.[3] With the rapid ageing of the Chinese population, the number of empty nesters is on the rise as well.[4] Empty-nest seniors are those seniors who are childless or whose children have already left home.[5] With the increasing number of elderly empty nesters, long-term care for the elderly has been emerging as a social problem.

Traditionally, taking care of the elderly by adult children in the family was a basic norm within Confucian doctrine.[6] In recent years, increased geographical mobility and reduced family size due to the one-child policy have made more adult children unavailable for elder care.[7] Intergenerational relations are also changing; thus, elderly support is no longer considered an absolute obligation by adult children.[8 9] More women in urban China are obtaining a higher education and becoming more work oriented, which indicates that gender roles in elder care are changing, and the availability of elder care by adult children has become questionable.[10] On the other hand, with Chinese 'baby boomers' approaching retirement age, informal care, such as familial care, is unlikely to meet the needs of all seniors.[11] One study indicated that nearly half of the seniors who

INTRODUCTION

Since 1999, the proportion of seniors aged 60 and above among the general population in China has reached more than 10%, and the number of people in the ageing population in China has ranked the first in the world.[1] The number of Chinese people aged 60 years and above reached 212.4 million by 2014,

needed some level of assistance in their activities of daily living (ADL) or instrumental ADL actually lived alone instead of living with their adult children.[10] Another study found that many seniors expressed preference to live alone or with their spouse, if housing and health status permitted.[12] Consequently, institutional care has been strongly promoted to meet older adults' long-term care needs.[13]

After the welfare reform in 1990s, former government-sponsored nursing homes have become decentralised, and the amount of private nursing homes is on the rise, mostly emerging in large cities.[7] Previous studies have identified the attitudes of empty-nest elderly towards institutional care and its predictors. Some studies found that the rate of institutional care of the Chinese elderly was rapidly on the rise, which might be due to the elderly increasing need.[14 15] A study found that seniors' living arrangements prior to elder home placement and their assessment of the cost involved for such care were related to seniors' willingness to stay in elder homes.[16] Some other studies found that factors, including gender, educational attainment, occupation, health insurance and number of children, were associated with willingness for institutional care among the empty-nest seniors.[17–19] However, only a few of these studies were published in international journals. Moreover, the studies described earlier had some systematic weaknesses. First, almost all of the empirical studies were based on small sample sizes (eg, n=523 in the case of Xie *et al*; n=570 in the case of Chen; n=1000 in the case of Zhu *et al*).[17–19] Second, in many studies, it was not clear who served as the reference group. In other words, the associated factors were only explored in empty-nest seniors.[17–19]

To remedy this situation, the present study aimed to compare the willingness to use institutional care between empty-nest and non-empty-nest seniors in China. To do so, we had the following specific objectives. First, we compared the willingness for institutional care between empty-nest and non-empty-nest elderly. Second, we identified the associated factors for institutional care among the empty-nest and non-empty-nest elderly. Our study was an empirical study and was not guided by theory.

METHODS
Data
This study was conducted in Shandong, a province where the elderly aged 65 or over accounted for 11.6% of the total population.[20] In this study, a three-stage cluster sampling was used to select participants, as described in detail previously.[21] A total of 3923 older people were included in the analysis. We used a face-to-face interview to collect data from November 2011 to January 2012. The interviews were conducted by trained master students from Shandong University School of Public Health. To ensure quality, completed questionnaires were carefully checked by quality supervisors at the end of each day. The questionnaire included demographic

characteristics, living arrangements of the households, relationship with children, marital status, economic status, mental health condition and willingness for institutional care.

Variables and measures
The dependent variable was seniors' willingness for institutional care, which was evaluated on the grounds of participant answers to 'which endowment way are you willing for?' If the response was 'institutional care', the willingness for institutional care was coded as 'yes'. In contrast, if the answer was 'home-based care', 'community endowment' or 'others', willingness for institutional care was coded as 'no'.

Sociodemographic and psychological characteristics such as gender, age, education, past occupation (preretirement occupation), marital status, number of children, relationship with children, residence, self-reported health status, psychological stress, ADL, non-communicable diseases (NCDs) and household income were included in this study.

The age of the participants was categorised as follows: 60-, 70- and 80+ years. Other demographic characteristics were classified as follows: gender (male vs female), education (illiteracy or semiliterate, primary school and junior school or above), past occupation (farmer vs others), marital status (single vs couple), number of children (0–3 vs >3), relationship with children (good vs bad), residence (urban vs rural), self-reported health status (good vs normal or poor), ADL ($\square$–III), NCDs in the past 6 months (yes vs no) and household income (Q1–Q4). Quartile 1 (Q1) is the poorest and Quartile 4 (Q4) is the richest.

The living arrangements of elderly households were classified into non-empty nester, empty-nest single and empty-nest couple. Non-empty nester refers to those seniors who live with their children, while empty-nest single and empty-nest couple refer to those seniors who live alone without a spouse and with a spouse, respectively, for more than 6 months.[22] Per capita living space is a measure that takes total living space (square metre) and divides it by the number of permanent people (who live in the house more than half a year) in a house.

Psychological stress was evaluated on the grounds of the 10-item Kessler Scale (K10). K10 is an effective tool to assess people's psychological status and was designed by scholars such as Kessler and Mroczek.[23] The Chinese-language version of the K10 has been verified to have good reliability and validity.[24]

The ADL instrument consisted of the Physical Self-maintenance Scale and Instrumental ADL Scale designed by Lawton and Brody.[25] The ADL Scale was used to evaluate people's simple and basic ability to practise one's normal life independently. The reliability and validity of the ADL instrument in the Chinese-language version were demonstrated to be good.[26] Scores for ADL can be divided into three levels, with the higher level representing more severe dysfunction. Levels 1, 2 and 3

Table 1 Sociodemographic characteristics of the elderly in Shandong, China (n=3923)

Characteristics	Total n (%)	Empty-nest single n (%)	Empty-nest couple n (%)	Non-empty nester n (%)	χ^2/F	P values
N	3923 (100.0)	391 (10.0)	1934 (49.3)	1598 (40.7)		
Gender					43.525	<0.001
Male	1821 (46.4)	132 (33.8)	983 (50.8)	706 (44.2)		
Female	2102 (53.6)	259 (66.2)	951 (49.2)	892 (55.8)		
Age					145.042	<0.001
60–	2568 (65.5)	162 (41.4)	1257 (65.0)	1149 (71.9)		
70–	1122 (28.6)	183 (46.8)	588 (30.4)	351 (22.0)		
80–	233 (5.9)	46 (11.8)	89 (4.6)	98 (6.1)		
Education					84.222	<0.001
Illiteracy or semiliterate	1744 (44.5)	240 (61.4)	744 (38.5)	760 (47.6)		
Primary school	1171 (29.8)	96 (24.6)	633 (32.7)	442 (27.7)		
Junior school or above	1008 (25.7)	55 (14.1)	557 (28.8)	396 (24.8)		
Past occupation					34.103	<0.001
Farmer	2519 (64.2)	278 (71.1)	1156 (59.8)	1085 (67.9)		
Others	1404 (35.8)	113 (28.9)	778 (40.2)	513 (32.1)		
Marital Status					2024.826	<0.001
Single*	820 (20.9)	391 (100.0)	0 (0.0)	429 (26.8)		
Couple	3103 (79.1)	0 (0.0)	1934 (100.0)	1169 (73.2)		
No of children					42.968	<0.001
0–3	2643 (67.4)	212 (54.2)	1290 (66.7)	1141 (71.4)		
>3	1280 (32.6)	179 (45.8)	644 (33.3)	457 (28.6)		
Relationship with children†					35.101	<0.001
Good or normal	3581 (92.9)	298 (85.6)	1782 (92.7)	1501 (94.6)		
Poor	275 (7.1)	50 (14.4)	140 (7.3)	85 (5.4)		
Residence					150.403	<0.001
Urban	1768 (45.1)	155 (39.6)	912 (47.2)	701 (43.9)		
Rural	2155 (54.9)	236 (60.4)	1022 (52.8)	897 (56.1)		
Self-reported health status					28.629	<0.001
Good	2044 (52.1)	173 (44.2)	962 (49.7)	909 (56.9)		
Normal or poor	1879 (47.9)	218 (55.8)	972 (50.3)	689 (43.1)		
Psychological stress	15.8±6.0	17.3±7.2	15.6±5.7	15.6±5.9	1.743	0.004
ADL					75.403	<0.001
I	2853 (72.7)	217 (55.5)	1403 (72.5)	1233 (77.2)		
II	631 (16.1)	98 (25.1)	313 (16.2)	220 (13.8)		
III	439 (11.2)	76 (19.4)	218 (11.3)	145 (9.1)		
NCD					26.274	<0.001
Yes	2586 (65.9)	296 (75.7)	1293 (66.9)	997 (62.4)		
No	1337 (34.1)	95 (24.3)	641 (33.1)	601 (37.6)		
Household income‡					371.563	<0.001
Q1	996 (25.4)	221 (56.5)	537 (27.8)	238 (14.9)		
Q2	1001 (25.5)	81 (20.7)	551 (28.5)	369 (23.1)		
Q3	965 (24.6)	69 (17.6)	414 (21.4)	482 (30.2)		
Q4	961 (24.5)	20 (5.1)	432 (22.3)	509 (31.9)		
Per capita living space	33.9±23.1	53.0±42.6	36.9±20.0	25.4±14.6	7.255	<0.001

*Single includes those who were unmarried (1.7%), divorced (0.3%), widowed (18.6%) or separated (0.3%).
†Sixty-seven of the participants were childless elders and were regarded as missing data here.
‡Quartile 1 (Q1) is the poorest and Quartile 4 (Q4) is the richest.
ADL, activities of daily living; NCD, non-communicable disease.

mean mild dysfunction, moderate dysfunction and severe dysfunction, respectively.[27]

We also present the variables and assignments in online supplementary appendix table 1.

Statistical analysis

The data were double entered and checked using EpiData V.6.04. Statistical analyses were performed using SPSS V.21.0. For continuous variables, p values were calculated using a Student's t-test or F-test; for categorical variables, p values were calculated using a χ^2 test. Two binary logistic regression models were employed to assess the association between living arrangements of elderly households and willingness for institutional care. We used a univariate logistic regression model and multivariate logistic regression model to explore the factors associated with willingness for institutional care. All reported CIs were calculated at the 95% level. Statistical significance was set at the 5% level.

Patient and public involvement statement

Neither patients nor the public were involved in the development of the research question, in the analysis and in drawing conclusions from the results. The results in this study will provide evidence for policy-makers and will not be disseminated to the study participants.

RESULTS

Table 1 shows basic information on the 3923 seniors. Approximately 8.5% seniors indicated willingness for institutional care. Non-empty nesters accounted for 40.7% of the participants, empty-nest singles accounted for 10.0% and empty-nest couples accounted for 49.3%. Generally, the majority of the elderly were female (53.6%), between the ages of 60 and 69 (65.5%), illiterate or semiliterate (44.5%), farmers (64.2%), couples (79.1%), having 0–3 children (67.4%), having a good or normal relationship with their children (91.3%), rural (54.9%), having good self-reported health status (52.1%), having mild dysfunction (72.7%) and having NCDs (65.9%). The elderly's K10 score was 15.8±6.0 (M±SD), and their per capita living space was 33.9±23.1 (M±SD) square metres.

We presented our results in two models to understand the association between living arrangements of elderly households and willingness for institutional care. Model 1 showed that willingness for institutional care was higher in empty-nest singles (OR 2.759; 95% CI 1.974 to 3.857) and empty-nest couples (OR 1.340; 95% CI 1.038 to 1.729) than that in non-empty nesters. When other variables were controlled, willingness for institutional care was still higher among empty-nest singles (OR 5.301; 95% CI 2.838 to 9.904) and empty-nest couples (OR 1.547; 95% CI 1.135 to 2.107) than that in non-empty nesters (table 2). Figure 1 shows that in each of the three subgroups with different household living arrangements, urban seniors' willingness to use institutional care was statistically higher than that of rural seniors.

Table 3 shows the factors associated with willingness for institutional care among empty-nest singles. Univariate analysis indicated that empty-nest singles who were from rural areas (p<0.001) had lower willingness for institutional care. Empty-nest singles who had greater psychological stress (p=0.050) had higher willingness for institutional care. Multivariate logistic analysis also showed that the two factors were associated with willingness for institutional care.

As shown in table 4, univariate analysis showed that those empty-nest couples who had a higher education level, who were non-farmers (p<0.001), who had a poor relationship with their children (p=0.014) and who had higher household incomes were more willing for institutional care. Those empty-nest couples who had more than three children (p=0.040), who lived in rural areas (p<0.001), who had severe dysfunction (p=0.003) and who had more per capita living space (p=0.019) were less willing for institutional care. Multilogistic regression indicated that factors including education level, relationship with children, household income and residence were associated with willingness for institutional care.

Likewise, for those non-empty-nest seniors, the multilogistic regression model found that those with younger age, those who had fewer children, those who were from urban areas and those who had a normal or poor self-rated health status preferred to use institutional care (see table 5).

DISCUSSION

Our study found that 8.5% of the seniors had willingness for institutional care. This rate was lower than the that found among Korean American elders (45%) with a similar age.[28] This rate was lower than the reported rates of 20% in an urban area and 17% in a rural area in the elderly in China and 16.7% in a study of the seniors aged 65 or above in Taiwan, China. This rate was also lower than the 9.69% found in an older population in Zhejiang, China, and 44.8% found in a study in the elderly with a similar age in Chengdu, China.[13 29–31] Compared with the above-mentioned sites, Shandong is a rather conservative province that is deeply affected by Confucianism. The culture of filial piety is profoundly rooted in Shandong residents' minds. This might be a primary cause of the variation between our study and the previous studies mentioned above.

Our results showed that living arrangements of the households were associated with the elderly willingness for institutional care. The analysis made it clear that empty-nest singles and empty-nest couples were more willing for institutional care than non-empty nesters. This finding was consistent with another study that found that older adults who had no spouse or children were more likely to move into nursing homes than their counterparts.[7 32] Due to lack of care from adult children, empty-nest seniors are facing more endowment risks. Empty-nest elderly had poorer self-rated health, higher prevalence of 2-week

Table 2 Association of willingness for institutional care and household composition in Shandong, China

Characteristics	Model 1 (no covariates)		Model 2 (covariates)	
	OR (95% CI)	P values	OR (95% CI)	P values
Household composition				
Non-empty nester	1.0		1.0	
Empty-nest single	2.759 (1.974 to 3.857)	<0.001	5.301 (2.838 to 9.904)	<0.001
Empty-nest couple	1.340 (1.038 to 1.729)	0.024	1.547 (1.135 to 2.107)	0.006
Gender				
Male			1.0	
Female			1.223 (0.938 to 1.595)	0.137
Age				
60–			1.0	
70–			1.017 (0.754 to 1.371)	0.912
80–			1.144 (0.612 to 2.139)	0.674
Education				
Illiteracy or semiliterate			1.0	
Primary school			1.166 (0.835 to 1.627)	0.368
Junior school or above			1.617 (1.128 to 2.136)	0.009
Past occupation				
Farmer			1.0	
Others			1.283 (0.899 to 1.830)	0.169
Marital Status				
Single*			1.0	
Couple			1.190 (0.680 to 2.085)	0.542
No of children				
0–3			1.0	
>3			0.755 (0.559 to 1.021)	0.068
Relationship with children				
Good or normal			1.0	
Poor			2.504 (1.685 to 3.720)	<0.001
Residence				
Urban			1.0	
Rural			0.546 (0.383 to 0.778)	<0.001
Self-reported health status				
Good			1.0	
Normal or poor			1.019 (0.778 to 1.334)	0.891
Psychological stress			0.998 (0.975 to 1.020)	0.833
ADL				
I			1.0	
II			0.910 (0.637 to 1.299)	0.603
III			0.577 (0.334 to 0.997)	0.049
NCD				
Yes			1.0	
No			0.957 (0.717 to 1.277)	0.764
Household income†				
Q1			1.0	
Q2			1.514 (0.995 to 2.304)	0.053
Q3			1.612 (1.017 to 2.554)	0.042
Q4			2.065 (1.271 to 3.354)	0.003

Continued

Table 2 Continued

Characteristics	Model 1 (no covariates)		Model 2 (covariates)	
	OR (95% CI)	P values	OR (95% CI)	P values
Per capita living space			0.989 (0.983 to 0.996)	0.003
Constant	0.070	<0.001	0.044	<0.001
R squared		0.019		0.112
Observations	3923			

*Single includes those who were unmarried (1.7%), divorced (0.3%), widowed (18.6%) or separated (0.3%).
†Quartile 1 (Q1) is the poorest and Quartile 4 (Q4) is the richest.
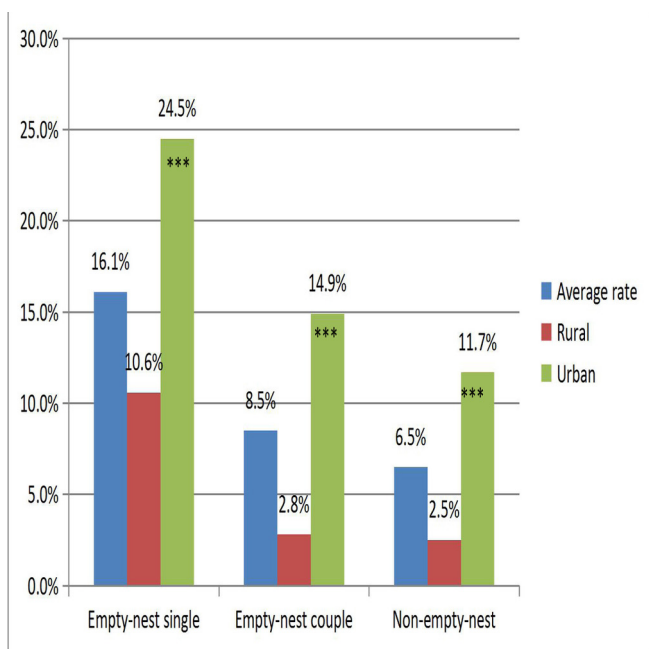ADL, activities of daily living; NCD, non-communicable disease.

illness and NCDs, which indicated that they had poorer health status than non-empty-nest elderly.[5] In addition, empty-nest seniors, in comparison with non-empty-nest seniors, had higher levels of loneliness.[33] The high physical and mental health service needs might be the reason why empty-nest seniors are more willing for institutional care, which can provide professional healthcare.

Consistent with previous studies, our results also showed that residence was a key predictor of willingness for institutional care in all three types of elderly households.[34] Urban seniors had statistically higher willingness for institutional care than rural seniors across all three types of elderly households. Compared with rural seniors, urban seniors were less conservative. Rural seniors had lower incomes and poorer social welfare conditions than urban seniors. Further, the supply of institutional care was relatively deficient in rural areas. These differences between rural and urban areas might explain why rural seniors were less willing for institutional care. This

Figure 1 Prevalence of seniors' willingness for institutionalisation among empty-nest singles, empty-nest couples and non-empty nesters in Shandong, China (n=3923). ***P<0.001.

finding was helpful for policy-makers to differentially allocate the institutional care resources in urban and rural China.

Among empty-nest singles, psychological stress was a positive determinant for institutional care, which was in accordance with previous studies.[35] To avoid excessive reliance on family members, which may result in tensions in the family, when seniors had psychological stress, they would rather choose institutional care.[36] This might be associated with empty-nest singles' attitudes of self-reliance.

Similar to previous studies, empty-nest seniors who had a normal relationship with children were more willing for institutional care.[13] Having a good relationship with children represents more financial assistance and spiritual comfort from children. When seniors were in a poor relationship with children, they usually relied less on their adult children, which may lead to more willingness for institutional care. Empty-nest couples with higher household income were more likely to prefer institutional care which is inconsistent with previous studies in Finland.[37] Finland health system partially funds most long-term care provided at institutional facilities including health centres and nursing homes, with the maximum user fees not exceeding 80% of patients' disposable income.[38] Given this, extremely high expenditures in absolute value that would be imposed on affluent patients could economically discourage them from seeking long-term institutional care. In China, most institutional care was provided by private institutions, and the charges for different services were fixed so that, compared with Finland seniors, higher-income seniors in China will not have financial concerns. It was vital to develop pro-poor institutional care policies for those lower-income empty-nest seniors with high willingness for institutional care. We also found that empty-nest couples with more per capita living space were less willing for institutional care. Per capita living space actually could be a representative of wealth. Seniors with higher per capita living space might be richer, given the circumstance of China's rapidly growing housing prices. This might explain why empty-nest couples with more per capita living space were more willing for institutional care. Further, empty-nest couples with an education level of junior school or above were

Table 3 Factors associated with willingness for institutional care among older empty-nest singles in Shandong, China (n=391)

Characteristics	Willingness for institutionalisation		COR (95% CI)	P values	AOR (95% CI)	P values
	Yes (%)	No (%)				
n=391	63 (16.1)	328 (83.9)				
Gender						NA
Male	21 (15.9)	111 (84.1)	1.0			
Female	42 (16.2)	217 (83.8)	1.023 (0.578 to 1.812)	0.938		
Age						NA
60–	27 (16.7)	135 (83.3)	1.0	0.708		
70–	27 (14.8)	156 (85.2)	0.865 (0.484 to 1.547)	0.626		
80–	9 (19.6)	37 (80.4)	1.216 (0.526 to 2.810)	0.647		
Education						NA
Illiteracy or semiliterate	38 (15.8)	202 (84.2)	1.0			
Primary school	17 (17.7)	79 (82.3)	1.144 (0.610 to 2.144)	0.675		
Junior school or above	8 (14.5)	47 (85.5)	0.905 (0.396 to 2.066)	0.812		
Past occupation						NA
Farmer	40 (14.4)	238 (85.6)	1.0			
Others	23 (20.4)	90 (79.6)	1.521 (0.862 to 2.682)	0.148		
No of children						NA
0–3	38 (17.9)	174 (82.1)	1.0			
>3	25 (14.0)	154 (86.0)	0.743 (0.429 to 1.288)	0.290		
Relationship with children*						NA
Good or normal	39 (13.1)	259 (86.9)	1.0			
Poor	11 (22.0)	39 (78.0)	1.873 (0.886 to 3.962)	0.101		
Residence						
Urban	38 (24.5)	117 (75.5)	1.0		1.0	
Rural	25 (10.6)	211 (89.4)	0.365 (0.210 to 0.634)	**<0.001**	0.304 (0.161 to 0.572)	<0.001
Self-reported health status						NA
Good	24 (13.9)	149 (86.1)	1.0			
Normal or poor	39 (17.9)	179 (82.1)	1.353 (0.778 to 2.352)	0.284		
Psychological stress†	63 (16.1)	328 (83.9)	1.036 (1.000 to 1.073)	**0.050**	1.045 (1.007 to 1.085)	0.019
ADL						NA
I	32 (14.7)	185 (85.3)	1.0			
II	18 (18.4)	80 (81.6)	1.301 (0.690 to 2.453)	0.416		
III	13 (17.1)	63 (82.9)	1.193 (0.589 to 2.415)	0.624		
NCD						NA
Yes	50 (16.9)	246 (83.1)	1.0			
No	13 (13.7)	82 (86.3)	0.780 (0.403 to 1.508)	0.460		
Household income‡						
Q1	29 (13.1)	192 (86.9)	1.0		1.0	
Q2	19 (23.5)	62 (76.5)	2.209 (1.064 to 3.869)	**0.032**	1.434 (0.721 to 2.851)	0.304
Q3	13 (18.8)	56 (81.2)	1.537 (0.749 to 3.154)	0.241	0.832 (0.373 to 1.858)	0.654
Q4	2 (10.0)	18 (90.0)	0.736 (0.162 to 3.337)	0.691	0.401 (0.084 to 1.917)	0.252
Per capita living space	63 (16.1)	328 (83.9)	0.997 (0.990 to 1.005)	0.504		NA

The bold values mean statistical significance.
*Forty-three of the participants are childless elders and were regarded as missing data here.
†We also included 'psychological stress' in a multivariate logistic regression model.
‡Quartile 1 (Q1) is the poorest and Quartile 4 (Q4) is the richest.
ADL, activities of daily living; AOR, adjusted OR; COR, crude OR; NA, not applicable; NCD, non-communicable disease.

Table 4 Factors associated with willingness for institutional care among old empty-nest couples in Shandong, China (n=1934)

Characteristics	Willingness for institutionalisation		COR (95% CI)	P values	AOR (95% CI)	P values
	Yes (%)	No (%)				
n=1934	165 (8.5)	1769 (91.5)				
Gender						NA
Male	83 (8.4)	900 (91.6)	1.0			
Female	82 (8.6)	869 (91.4)	1.023 (0.744 to 1.408)	0.888		
Age						NA
60–	100 (8.0)	1157 (92.0)	1.0	0.384		
70–	58 (9.9)	530 (90.1)	1.266 (0.902 to 1.778)	0.173		
80–	7 (7.9)	82 (92.1)	0.988 (0.445 to 2.195)	0.976		
Education						
Illiteracy or semiliterate	34 (4.6)	710 (95.4)	1.0		1.0	
Primary school	45 (7.1)	588 (92.9)	1.598 (1.010 to 2.528)	0.045	1.139 (0.703 to 1.845)	0.660
Junior school or above	86 (15.4)	471 (84.6)	3.813 (2.521 to 5.767)	<0.001	1.918 (1.173 to 3.135)	0.009
Past occupation						
Farmer	54 (4.7)	1102 (95.3)	1.0		1.0	
Others	111 (14.3)	667 (85.7)	3.396 (2.419 to 4.767)	<0.001	0.909 (0.535 to 1.544)	0.724
No of children						
0–3	122 (9.5)	1168 (90.5)	1.0		1.0	
>3	43 (6.7)	601 (93.3)	0.685 (0.477 to 0.983)	0.040	0.878 (0.598 to 1.288)	0.506
Relationship with children*						
Good or normal	145 (8.1)	1637 (91.9)	1.0		1.0	
Poor	20 (14.3)	120 (85.7)	1.882 (1.138 to 3.111)	0.014	2.677 (1.553 to 4.615)	<0.001
Residence						
Urban	136 (14.9)	776 (85.1)	1.0		1.0	
Rural	29 (2.8)	993 (97.2)	0.167 (0.110 to 0.252)	<0.001	0.167 (0.110 to 0.252)	<0.001
Self-reported health status						NA
Good	85 (8.8)	877 (91.2)	1.0			
Normal or poor	80 (8.2)	892 (91.8)	0.925 (0.672 to 1.273)	0.634		
Psychological stress	165 (8.5)	1769 (91.5)	0.984 (0.955 to 1.014)	0.289		
ADL						
I	134 (9.6)	1269 (90.4)	1.0		1.0	
II	24 (7.7)	289 (92.3)	0.786 (0.500 to 1.237)	0.298	0.905 (0.563 to 1.453)	0.678
III	7 (3.2)	211 (96.8)	0.314 (0.145 to 0.681)	0.003	0.436 (0.196 to 1.018)	0.052
NCD						NA
Yes	118 (9.1)	1175 (90.9)	1.0			
No	47 (7.3)	594 (92.7)	0.788 (0.554 to 1.121)	0.185		
Household income†						
Q1	11 (2.0)	526 (98.0)	1.0		1.0	
Q2	34 (6.2)	517 (93.8)	3.145 (1.576 to 6.273)	0.001	2.676 (1.326 to 5.400)	0.006
Q3	44 (10.6)	370 (89.4)	5.686 (2.898 to 11.157)	<0.001	3.117 (1.430 to 6.798)	0.004
Q4	76 (17.6)	356 (82.4)	10.208 (5.348 to 19.485)	<0.001	4.674 (2.057 to 10.621)	<0.001
Per capita living space	165 (8.5)	1769 (91.5)	0.989 (0.980 to 0.998)	0.019	0.984 (0.974 to 0.995)	0.003

*Twelve of the participants are childless elders and were regarded as missing data here.
†Quartile 1 (Q1) is the poorest and Quartile 4 (Q4) is the richest.
ADL, activities of daily living; AOR, adjusted OR; COR, crude OR; NA, not applicable; NCD, non-communicable disease.

Table 5 Factors associated with willingness for institutional care among older non-empty nesters in Shandong, China (n=1598)

Characteristics	Willingness for institutionalisation		COR (95% CI)	P values	AOR (95% CI)	P values
	Yes (%)	No (%)				
n=1598	104 (6.5)	1494 (93.5)				
Gender						NA
Male	48 (6.8)	658 (93.2)	1.0		1.0	
Female	56 (6.3)	836 (93.7)	0.918 (0.616 to 1.368)	0.675		
Age						
60–	93 (8.1)	1056 (91.9)	1.0	0.001	1.0	
70–	10 (2.8)	341 (97.2)	0.333 (0.171 to 0.647)	0.001	0.405 (0.210 to 0.814)	0.011
80–	1 (1.0)	97 (99.0)	0.117 (0.016 to 0.849)	0.034	0.209 (0.027 to 1.591)	0.131
Education						
Illiteracy or semiliterate	34 (4.5)	726 (95.5)	1.0		1.0	
Primary school	30 (6.8)	412 (93.2)	1.555 (0.938 to 2.578)	0.087	0.962 (0.561 to 1.649)	0.887
Junior school or above	40 (10.1)	356 (89.9)	2.399 (1.493 to 3.856)	<0.001	1.099 (0.630 to 1.916)	0.739
Past occupation						
Farmer	48 (4.4)	1037 (95.6)	1.0		1.0	
Others	56 (10.9)	457 (89.1)	2.647(1.773-.953)	<0.001	1.103 (0.669 to 1.818)	0.702
Marital status*						
Single	18 (4.2)	411 (95.8)	1.0		1.0	
Couple	86 (7.4)	1083 (92.6)	1.813 (1.077 to 3.051)	**0.025**	1.216 (0.697 to 2.122)	0.492
No of children						
0–3	91 (8.0)	1050 (92.0)	1.0		1.0	
>3	13 (2.8)	444 (97.2)	0.338 (0.187 to 0.610)	<0.001	0.506 (0.271 to 0.948)	0.033
Relationship with children†						NA
Good or normal	92 (6.1)	1409 (93.9)	1.0			
Poor	9 (10.6)	76 (89.4)	1.814 (0.881 to 3.735)	0.106		
Residence						
Urban	82 (11.7)	619 (88.3)	1.0		1.0	
Rural	22 (2.5)	875 (97.5)	0.19 (0.117 to 0.307)	<0.001	0.210 (0.122 to 0.363)	**<0.001**
Self-reported health status						
Good	48 (5.3)	861 (94.7)	1.0		1.0	
Normal or poor	56 (8.1)	633 (91.9)	1.587 (1.065 to 2.365)	0.023	1.854 (1.225 to 2.805)	0.003
Psychological stress	104 (6.5)	1494 (93.5)	0.990 (0.956 to 1.026)	0.595		NA
ADL						NA
I	89 (7.2)	1144 (92.8)	1.0			
II	11 (5.0)	209 (95.0)	0.677 (0.355 to 1.288)	0.234		
III	4 (2.8)	141 (97.2)	0.365 (0.132 to 1.008)	0.052		
NCD						
Yes	65 (6.5)	932 (93.5)	1.0			NA
No	39 (6.5)	562 (93.5)	0.995 (0.660 to 1.500)	0.981		
Household income‡						
Q1	15 (6.3)	223 (93.7)	1.0			NA
Q2	12 (3.3)	357 (96.7)	0.500 (0.230 to 1.087)	0.080		
Q3	30 (6.2)	452 (93.8)	0.987 (0.520 to 1.872)	0.967		
Q4	47 (9.2)	462 (90.8)	1.512 (0.828 to 2.764)	0.179		
Per capita living space	104 (6.5)	1494 (93.5)	0.985 (0.969 to 1.001)	0.073		NA

The bold values mean statistical significance.
*Single includes those who are unmarried (0.9%), divorced (0.3%), widowed (25.3%) or separated (0.3%).
†Twelve of the participants are childless elders and were regarded as missing data here.
‡Quartile 1 (Q1) is the poorest and Quartile 4 (Q4) is the richest.
ADL, activities of daily living; AOR, adjusted OR; COR, crude OR; NA, not applicable; NCD, non-communicable disease.

more willing for institutional care, which was consistent with previous studies.[34]

It was found that age 70 and 79 years, having more than three children and normal self-reported health status were risk factors for non-empty nesters. Those who were age 70 and 79 had less preference for institutional care, which was inconsistent with one study in Hong Kong and other developed countries where the likelihood of elderly living in institutional care increased with age.[39 40] Hong Kong and other developed countries are more developed and open than Shandong, which makes those seniors more open minded about institutional care. Different value concepts about institutional care might explain why those seniors were more willing for institutional care when compared with Shandong seniors. Non-empty-nest seniors who had more than three children were less willing for institutional care. More children usually mean more financial and physical assistance, so it might reduce elderly needs for institutional care.[10]

This study had a large size sample (nearly 4000), which is much larger than that used in most of the similar studies. This gave the study a high degree of statistical power. This study had some limitations. First, our study had a cross-sectional design, and the results could not be interpreted as cause and effect. Second, all data were based on self-reported measures, which could lead to recall biases. Third, even though we have included some variables of social support in this study (eg, living arrangements of the elderly households, number of the children and relationship with children), we did not use a scale to measure social support of the seniors, which will be remedied in a future study. Finally, our investigation was conducted in Shandong province, which is rather a conservative region, thus, the results of our study may not be generalised to other parts of China.

CONCLUSION

Our study suggested that the living arrangements of households with seniors were associated with the willingness for institutional care of the elderly in China, and empty nesters were more willing for institutional care than their counterparts. Our results also showed that residence was a key associated factor for willingness for institutional care in all three types of elderly households. The government should pay more attention to institutional care in rural areas where there is still a gap in elder care when compared with that in urban areas. Furthermore, we also identified some other associated factors for institutional care willingness among each type of elderly household. Targeting policies should be developed to offer appropriate institutional care for different types of seniors.

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