

ORIGINAL ARTICLE

Exploring community-based long-term care needs and predicting factors among older adults in China: A cross-sectional study

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ABSTRACT

The rapid growth of the aging population makes providing adequate long-term care (LTC) services for the elderly a critical social issue in China. However, older adults' LTC needs may differ as LTC services develop and traditional cultural norms change. Therefore, this study examines LTC service needs and predicting factors among community-dwelling older adults in Huanggang, China. A cross-sectional design was performed on 518 older people in Huanggang, China, selected by the cluster sampling method. Data collection employed a self-administered questionnaire consisting of six components: predisposing factors, enabling factors, activities of daily living, Self-Rating Anxiety Scales, the Geriatric Depression Scales, and the Long-Term Care Needs Scale. Multiple linear regression was performed to identify factors associated with LTC needs. Of the participants, 52.12% were female and 47.88% were male; the mean age was 70 years. The highest mean LTC need was in the dependency domain (mean = 3.50, SD = 0.80), and the lowest was in the living needs domain (mean = 2.16, SD = 1.12). Multiple linear regression showed that anxiety ($\beta = 0.676$, $p < 0.001$) and depressive symptoms ($\beta = 0.309$, $p < 0.001$) were positively associated with greater LTC needs, whereas lower activities of daily living (ADL) scores ($\beta = -0.087$, $p = 0.001$) predicted higher LTC needs. These findings indicate that LTC needs among older adults are strongly influenced by functional status and psychological distress, underscoring the importance of addressing these factors to enhance the quality and availability of LTC services.

Keywords:

long-term care, older adults, needs, China

Citation:

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INTRODUCTION

China has experienced a rapid acceleration in population aging since 2008, with the proportion of individuals aged 65 years and older projected to increase from 7.0% to 23.1% by 2050.¹ Concurrently, health challenges among older adults are becoming increasingly prominent, with over 78% affected by multiple chronic conditions and a growing number living with disabilities.² Consequently, the rapid demographic shift has led to an increased demand for healthcare and nursing services, making the provision of adequate long-term care (LTC) services a critical social issue.³ According to the World Health Organization, LTC encompasses “activities undertaken by others to ensure that people with, or at risk of, significant ongoing loss of intrinsic capacity can maintain a level of functional ability consistent with their basic rights, fundamental freedoms, and human dignity.”⁴ In China, efforts to establish a long-term care insurance system began in 2013, and by 2020, 29 cities had been selected as pilot sites. LTC provision in China comprises both informal care, primarily delivered by family members, and formal care, which may be community- or institution-based.⁵

Despite these efforts, LTC needs are often met through social hospitalization, contributing to escalating hospitalization costs. Changes in family structure, traditional cultural values (e.g., filial piety and familism), and the high cost and variable quality of institutional care may further limit the effective provision of LTC services for individuals with disabilities.^{6,7} Moreover, as LTC services evolve alongside shifts in cultural norms, caregiver resources and motivation, and family structures, older adults’ knowledge, attitudes, and preferences regarding LTC may also change.^{7,8} Consequently, the

selection of LTC services is influenced by individual preferences, socioeconomic factors, and care needs.^{7–9} The Andersen behavioral model has been widely applied to explain and predict health service utilization, including LTC use among older adults.¹⁰ According to the model, LTC needs are influenced by predisposing factors (e.g., age, sex, education, marital status), enabling factors (e.g., income, insurance coverage), and need factors (e.g., functional status, psychosocial factors, and number of chronic diseases), which directly affect service utilization.^{7–11} Huanggang City in Hubei Province provides a compelling context for examining LTC needs. By 2023, 22% of its population was aged 60 years or older, exceeding the national average of 18.7%,¹² placing considerable strain on local LTC systems. Urban areas face overcrowded facilities and a shortage of certified caregivers, with only 20% of staff holding formal geriatric certifications, while rural regions experience fragmented service networks, with merely 35% of villages equipped with community-based elderly care centers.¹³ Financial disparities exacerbate these challenges; despite national policies promoting home- and community-based care, LTC funding in Huanggang relies heavily on out-of-pocket payments, disproportionately affecting low-income families.^{12,14} Therefore, it is crucial to investigate the predictors of LTC needs among older people in Huanggang, China. We hypothesize that predisposing, enabling, and need factors are potentially key determinants of LTC needs. This study aims to examine the factors associated with LTC needs among community-dwelling older adults in Huanggang using the latest Andersen model framework, providing evidence to inform the development and optimization of LTC services tailored to the needs of older populations.

METHODS

Study design and settings

This cross-sectional study was conducted between January and May 2024 at six community areas in Huanggang, Hubei Province, China.

Study participants

The eligible participants were (1) older residents in Huanggang aged 60 years and above, (2) without reported communication or mental health problems, and (3) having normal cognitive functions. Individuals with severe visual or hearing impairments that prevented them from completing the questionnaire were excluded from the analysis. The sample size was calculated by using Cochran's formula,¹⁵ with an estimated percentage of older people choosing the mode of LTC as home care (76%) reported by Zeng et al.⁸. Based on a 95% confidence interval and precision of 4%, the minimum sample size was calculated at 438 older people, plus 15% for non-response adjustment, resulting in a final sample size of 516 older people. While collecting data, we recruited 518 eligible older people out of the 640 residents initially enrolled, yielding an effective response rate of 80.9%. A cluster sampling method was used to select eligible older people. The cluster was defined as a community. First, all ten communities in Huanggang City were divided into north and south clusters based on geographical location. The north group included five communities, and the south group included five communities. Second, the researcher randomly selected six communities (three from the north group and three from the south group) in proportion to the size of the two groups using the lottery method. Third, in each community, older people who met the study criteria were selected by computer-generated random numbers until the required sample size was reached.

Instruments

We utilized the Andersen health service utilization model to identify various influencing factors, categorizing them into predisposing, enabling, and need factors. This self-administered questionnaire was structured into four sections, detailed as follows.

Part 1: Predisposing factors included five items: age, sex, marital status, education level, and hobbies. Except for education, which was categorized into multiple levels, all other variables were treated as dichotomous.

Part 2: Enabling factors included three items: household monthly income, medical insurance status, and residential area. All were categorized as dichotomous variables.

Part 3: Need factors comprised of three items: Activity of Daily Living (ADL), history of chronic diseases, and psychological distress (e.g., anxiety and depression).

A history of chronic diseases was collected using a single self-report item derived from the study by Fu et al.⁷ Participants were asked, "Do you have chronic diseases?" This variable was classified as dichotomous (Yes/No).

ADL was measured using the Barthel Index for Activities of Daily Living, based on the study by Collin et al.,¹⁶ to assess participants' basic activities of daily living and their functional independence. This is a 10-item questionnaire with a 100-point rating scale. The total score ranges from 0 to 100; the scores were categorized into three grades: Grade I (61–100, mild dysfunction with basic self-care abilities), Grade II (41–60, moderate dysfunction requiring assistance), and Grade III (≤ 40 , severe dysfunction and complete dependence). Internal consistency in this study was acceptable (Cronbach's $\alpha=0.83$).

Psychological distress: Anxiety was assessed with the Zung Self-Rating Anxiety Scale (SAS),¹⁷ to measure individuals' anxiety levels. This is a 20-item questionnaire using a 4-point Likert scale ranging from 1 (none, or a little of the time) to 4 (most, or all of the time). Total scores range from 20 to 80. A standard score of 50 serves as the upper limit for normal anxiety levels, while scores below this threshold indicate no anxiety. The scale showed good internal consistency in this study (Cronbach's alpha was 0.85). Additionally, depression was measured using the Geriatric Depression Scale (GDS), based on the study by Yesavage et al.,¹⁸ This is a 30-item version, with dichotomous (Yes/No) responses, in which participants are asked to respond about how they felt over the past week. A score of ≤ 10 indicates normal state, whereas a score of > 10 suggests the presence of depression. Internal consistency and validity were acceptable (KR-20=0.83; CVI=0.85). Formal permissions for the use of both SAS and GDS were obtained from the respective copyright holders prior to data collection.

Part 4: Long-Term Care Needs (Primary outcome).

The Long-Term Care Needs Scale was developed by the research team based on a comprehensive literature review of LTC service needs among Chinese older adults, guided by LTC service needs in China.¹⁹ The scale contained 19 items across four dimensions: (1) living needs, (2) health needs, (3) knowledge needs, and (4) dependency needs. Each item was rated on a 5-point Likert scale ranging from 1 (no need) to 5 (very much needed). Average scores were computed, with higher scores reflecting greater LTC needs. Content validity was evaluated by five gerontology experts, yielding I-CVI=0.80 and S-CVI/Ave=0.90. The instrument demonstrated strong reliability (Cronbach's $\alpha=0.89$).

Data collection

The research team consisted of five trained members, who were health providers from the five health clinics in the selected community. The tool used for data collection was "Questionnaire Star" (<https://www.wjx.cn/>), a software package with powerful features to design and collect questionnaires. The self-administered questionnaire was conducted for older adults who met the eligibility criteria for the study. All selected participants were invited to take part and provided written informed consent before completing the questionnaire. The system prompted respondents to complete any missing items before submission; however, participants retained the right to skip any questions if they chose. The survey took approximately 30 to 45 minutes to complete.

Statistical analysis

Descriptive analyses were applied to analyze the participants' characteristics. The Kolmogorov-Smirnov test was used for normality testing; all continuous variables were normally distributed. The independent-sample t-tests were used to assess the differences in LTC needs scores in each predictor variable. We applied point-biserial correlation for all predisposing and enabling variables, polyserial correlation for the education variable, and other variables using Pearson's correlation to examine the correlations between the selected variables. Next, stepwise multiple linear regression analyses were used to examine the association between predisposing, enabling, and needs variables and LTC needs. All statistical analyses were performed using SPSS version 23.0 (IBM Corp., Armonk, NY, USA), and a p-value of < 0.05 was considered statistically significant.

Ethical Approval

All participants provided written informed consent after having received information on the research. We administered a self-reported questionnaire to the participants for data gathering purposes. This study was approved by the Ethics Committee for Research Involving Human Subjects at Mahasarakham University (ref. no.704-587/2024).

RESULTS

Sample characteristics

Most respondents (52.12%) were female, with a median age of 70 years, and approximately 27.08% had completed senior middle school. More than half (51.54%) reported being widowed/divorced/unmarried, and 50.97% have no hobbies. Additionally, most of the

participants (72.97%) resided in urban areas, 76.64% had household monthly incomes of more than 10,000 CNY, and 92.28% had medical insurance. Furthermore, the majority of them (70.46%) had chronic disease, and 77.03% reported ADL levels in Grades I and II. Regarding psychological distress, older people were identified as having anxiety (50.19%) and depression (26.25%). Additionally, the LTC needs scores that show significant differences in household monthly income levels, residential areas, ADL, and anxiety and depressive symptom levels ($p < 0.05$) (Table 1). Moreover, the LTC needs constructs showed the mean (standard deviations; SD) scores of total LTC needs, living needs, health needs, knowledge needs, and dependency needs were 3.28 (SD = 1.09), 2.16 (SD = 1.12), 3.04 (SD = 1.09), 3.44 (SD = 1.14), and 3.50 (SD = 0.80), respectively (Table 2).

Table 1. Distribution of predisposing, enabling, need factors and LTC needs scores.

	Total (n=518)		LTC needs scores	t	p-value ^a
	n	%	Mean ± SD		
Predisposing factors					
Age (y)			55.86 ± 8.46	-0.175	0.861
< 70	265	51.16	56.30 ± 8.17		
≥ 70	253	48.84			
Sex					
Male	248	47.88	55.24 ± 8.62	-0.644	0.520
Female	270	52.12	56.84 ± 8.02		
Education					
Illiteracy	71	13.71	57.84 ± 7.95	1.190	0.314
Primary school	121	23.36	50.00 ± 7.34		
Junior middle school	139	26.83	55.76 ± 8.79		
Senior middle school	144	27.08	57.28 ± 8.64		
College or above	43	8.30	54.67 ± 8.96		
Marital status					
Married	251	48.46	55.75 ± 8.40	-0.250	0.803
Others (single, separated, divorced, widowed)	267	51.54	56.38 ± 8.25		
Hobbies					
Yes	254	49.03	55.55 ± 8.93	-0.415	0.679
No	264	50.97	56.59 ± 7.72		

	Total (n=518)		LTC needs scores	t	p-value ^a
	n	%	Mean ± SD		
Enabling factors					
Household monthly income (CNY)					
< 10,000	121	23.36	23.36 ± 42.30	-14.34	<0.001*
≥ 10,000	397	76.64	76.64 ± 1.86		
Medical insurance					
Yes	478	92.28	92.28 ± 26.70	1.944	0.052
No	40	7.72	7.72 ± 26.67		
Residential areas					
Urban	378	72.97	72.97 ± 15.01	4.512	<0.001*
Rural	140	27.03	27.03 ± 5.09		
Need factors					
History of chronic diseases					
Yes	365	70.46	59.10 ± 7.65	1.594	0.111
No	153	29.54	54.79 ± 8.50		
ADL					
Grad I and II	399	77.03	48.82 ± 8.15	-12.091	<0.001*
Grad III	119	22.97	80.40 ± 7.82		
Anxiety					
Yes	260	50.19	78.77 ± 10.07	30.926	<0.001*
No	258	49.81	33.20 ± 11.50		
Depression					
Yes	136	26.25	83.38 ± 6.78	16.023	<0.001*
No	382	73.75	46.35 ± 6.63		

Note: CNY, Chinese Yuan; Values are presented as number (%) or mean ± standard deviation (SD);

^a P-value for independent t-tests

ADL, Activity of daily living; LTC, Long-term care

Grade I (61-100), indicating mild dysfunction with basic self-care abilities.

Grade II (41-60), indicating moderate dysfunction requiring assistance in daily life.

Grade III (≤40 points), indicating severe dysfunction and complete dependence on daily life

*Statistically significant at p < 0.05.

Table 2. The LTC needs scores of each construct.

LTC needs constructs	Scores
	Mean ± SD
Living needs	
1. The assistance of someone to manage my daily affairs is required	2.16 ± 1.12
2. I need someone to help me shop, such as for necessities	1.84 ± 1.30
2. I need someone to help me shop, such as for necessities	2.26 ± 1.46
Health needs	
3. I need someone who can help me manage the medications I need to take every day	3.04 ± 1.09
4. When I get sick, someone can help me	3.56 ± 1.38
5. I would like to have my blood pressure, blood sugar and body temperature measured regularly	2.39 ± 1.49
6. I'm constipated and I can get help with this problem	3.18 ± 1.58
7. Someone can help me with rehabilitation exercises	2.61 ± 1.49
Knowledge needs	
8. Hope someone can give some knowledge of disease prevention	3.48 ± 1.29
9. Hope to get some knowledge about healthy diet and exercise	3.44 ± 1.14
10. They can get relevant guidance of rehabilitation exercise	3.52 ± 1.28
	2.96 ± 1.51
	3.40 ± 1.22

LTC needs constructs	Scores
	Mean $\pm$ SD
Dependency needs	3.50 $\pm$ 0.80
11. Participate in social activities and make older friends	3.36 $\pm$ 1.39
12. Participate in a variety of activities, such as writing, calligraphy and painting, and handicrafts	3.27 $\pm$ 1.29
13. Participate in activities such as dancing and singing, which makes the body and mind happy	3.06 $\pm$ 1.38
14. Someone to keep me company	3.34 $\pm$ 1.36
15. When I am in a bad mood, someone can patiently listen to me and help me	3.36 $\pm$ 1.39
16. The staff cared for me like family and friends	3.97 $\pm$ 0.84
17. You can get the warmth like home of here	4.08 $\pm$ 0.74
18. Hope to increase social connection	3.82 $\pm$ 1.09
19. Organize activities and play their functions	3.22 $\pm$ 1.34
Total LTC needs	3.28 $\pm$ 1.09

Bivariate correlations

Table 3 shows that anxiety and depressive symptoms, residence areas, and history of chronic diseases were positively

correlated with total LTC needs ($p < 0.05$), whereas ADL and household monthly income were significantly negatively correlated with total LTC ($p < 0.05$).

Table 3. Correlation between selected variables and LTC needs (n=518).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Age	1												
2.Sex	-0.030	1											
3. Education	0.031	0.034	1										
4. Marital status	-0.086	-0.026	-0.323**	1									
5. Hobbies	-0.095	-0.036	-0.396**	0.318**	1								
6. Household monthly income	-0.012	-0.012*	0.305**	0.331**	0.691**	1							
7. Medical insurance	-0.002	0.114**	-0.059*	0.053	0.098**	0.073*	1						
8. Residential areas	-0.067	0.007	0.007	0.022	0.011	-0.001	0.125**	1					
9. History of chronic diseases	0.08	-0.15	-0.12	-0.05	-0.04	-0.15	-0.08	-0.10	1				
10. ADL	-0.086	0.201**	-0.077*	0.104**	0.047	0.028	0.095**	0.046	-0.089	1			
11.Anxiety	0.005	0.006	-0.009	-0.003	0.014	-0.018*	-0.007	0.020*	0.022*	0.045**	1		
12.Depression	0.007	-0.004	-0.011	-0.002	0.009	-0.025**	-0.005	0.015	0.018*	0.050**	0.065**	1	
13.Total LTC needs	0.003	0.010	0.015	0.007	0.005	-0.045**	0.012	0.035**	0.025**	-0.060**	0.070**	0.075**	1

Note: ADL, Activity of daily living; LTC, Long-term care; *p < 0.05; **p < 0.01

Age (0<70, 1≥70), Sex (0=male, 1=female), Marital status (0=married,1=others), Education (1= Illiteracy,2= Primary school,3= Junior middle school, 4= Senior middle school, 5= College or above), Hobbies (0=yes,1=no), Household monthly income (0 ≥ 10,000, 1 < 10,000), Medical insurance (0=yes, 1=no), Residential areas (0=rural, 1=urban), History of chronic diseases (0=no,1=yes).

Factors associated with long-term care needs

The stepwise multiple linear regression analysis was used to adjust and examine the influencing factors of LTC needs. After adjusting for all other predictors, a fitted model was statistically significant, which was used to predict the LTC needs at 76.1%. In addition, anxiety was the variable with the most direct effect on the level of LTC needs in the model. The results revealed that LTC needs were

negatively associated with ADL ($\beta = -0.087$, $p = 0.001$). The level of ADL increased, and the LTC needs level was significantly decreased by 0.087. However, LTC needs were strongly positively associated with anxiety ($\beta = 0.676$, $p < 0.001$) and depressive symptoms ($\beta = 0.309$, $p < 0.001$); when the level of anxiety and depressive symptoms increased, the LTC needs level was significantly increased by 0.309 and 0.676, respectively (Table 4).

Table 4. Multiple linear regression analysis toward LTC needs (n=518).

Variables	B	SE	β	<i>t</i>	95% CI of B	p-value
ADL	-5.845	1.748	-0.087	-3.344	-9.42, -2.27	0.001*
Anxiety	38.240	1.312	0.676	29.145	35.67, 40.81	<0.001*
Depression	19.878	1.683	0.309	11.810	16.58, 23.18	<0.001*

$R = 0.8735$, $R^2 = 0.763$, $R^2\text{Adj} = 0.761$, $F = 329.98$, $P = 0.000$, $R^2\text{change} = 0.001$

Note: Adjusted for age, sex, marital status, hobbies, education, household monthly income, medical insurance, residence, and history of chronic diseases.

ADL, Activity of daily living; B, unstandardized coefficients; SE, standard error; β , standardized coefficients; CI, confidence interval

*Statistically significant at $p < 0$.

DISCUSSION

This study was based on the hypothesis that LTC needs are influenced by a combination of predisposing, enabling, and need factors. Our findings did not support this hypothesis; the results showed that only need factors, including psychological distress and ADL, which are independent variables, collectively accounted for 76.1% of the variance in LTC needs.

Regarding the psychological distress—particularly anxiety and depressive symptoms—emerged as the strongest determinants of LTC needs (anxiety: $\beta = 0.676$; depression: $\beta = 0.309$). Consistent with prior studies, older adults experiencing psychological distress were

more likely to report higher LTC needs.^{11, 20} One plausible explanation is that psychological frailty, encompassing cognitive impairment, anxiety, and depressive symptoms, increases the risk of disability or frailty, partly mediated by reduced social activity, which in turn amplifies care needs.^{9,20} These findings suggest that incorporating psychological support into LTC services could substantially alleviate anxiety and depression, thereby reducing LTC needs.^{20,21}

In addition, lower ADL scores, indicating more severe functional impairment and complete dependence in daily life, were associated with greater LTC needs. This aligns with previous evidence demonstrating that higher levels of

disability, including impaired ADLs, correlate with elevated LTC service requirements.^{9,22,23} ADL impairments may serve as key indicators of personal independence and criteria for LTC allocation.²⁴ Furthermore, reduced ADL abilities are often accompanied by diminished mental health, lower social participation, and impaired sensory and communication skills, all of which contribute to increased LTC needs.²⁵ These results underscore the importance of interventions aimed at maintaining or restoring physical function to mitigate long-term care demands.

Furthermore, our results also revealed that most elderly people reported that dependency needs were the highest priority among all four dimensions of LTC needs. Consistent with prior studies, advanced age and increased dependency are key predictors of LTC needs.^{22,26} Especially those with emotional distress—particularly those experiencing social isolation due to widowhood, distant family members, or limited post-retirement social interactions—exhibit a critical need for spiritual solace and emotional engagement.²⁷ Therefore, improving family visitation systems and facilitating regular communication between seniors and their relatives could further mitigate emotional deprivation.^{22,26} This study suggests establishing psychological counseling services in care institutions and organizing interest-based recreational activities in order to enhance residents' sense of security and reduce their dependence.

This study had some limitations. First, the sample was limited to older people who resided in the community in Huanggang, Hubei Province, which may restrict the generalizability of the findings to other areas. Thus, future studies should recruit a nationally representative sample or study older people in other settings, such as institutions. Second, it was a cross-sectional study; thus, it did not establish direct causal relationships. Longitudinal

studies are required to better understand the causal relationships. Third, the self-reported measurement may be impacted by social desirability bias. To minimize the potential for self-report bias, validated and standardized instruments were used. Despite these limitations, our study provides insight into the LTC needs of elderly people in the community and their potential factors, such as psychological distress and ADL. These findings may be beneficial to develop and improve the LTC services to satisfy their needs. It also provides guidance for future policies or strategies for the development of LTC services for older people.

RECOMMENDATIONS

This study highlights the important role that psychological distress and ADL play in LTC needs among older people in the community. Therefore, when working with older people to enhance their LTC needs, social workers should pay more attention to those with anxiety and depressive symptoms as well as severe dysfunction and complete dependence in daily life activities, which may lead to further developing LTC services that are more effective. Furthermore, the government should encourage the provision of more support for older people and take action to improve LTC services according to their needs, which may enhance older people's utilization of LTC services in the community.

AUTHOR CONTRIBUTIONS

JY: Writing-original draft, Conceptualization, Formal analysis, Methodology, Investigation, Methodology, Resources and Software. Jian Yang: Writing-original draft, Formal analysis and Investigation. NY: Writing-original draft, Software and Validation. PH: Writing-review & editing and Supervision.

ETHICAL CONSIDERATION

This study titled “Demand and Supply of Long-term Care Services for the Elderly in Huang Gang City, Hubei Province, China” was reviewed and approved by the Ethics Committee for Research Involving Human Subjects of Mahasarakham University, Thailand (Approval No. 704-587/2024). The approval was granted on November 20, 2024, and remains valid until November 19, 2025, under an expedited review procedure.

All procedures involving human participants in this study were conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments. Informed consent was obtained from all individual participants included in the study. Any modifications to the research protocol or consent forms will be re-submitted for ethical review.

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CONFLICTS OF INTERESTS

There are no conflicts of interest.

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