



Predictors of Quality of Life among Older Adults in Nursing Homes in Wenzhou, China

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Abstract

The quality of life (QOL) of older adults is a key indicator of their physical and mental health and overall well-being. This study aimed to examine the factors influencing QOL among older adults in nursing homes in Wenzhou, China. The four predictive factors included the older adults' functional status, care satisfaction, perceived social support, and depression. The samples consisted of 142 older adults in nursing homes in Wenzhou. Simple random sampling was used to recruit the samples. Data were collected from March 1 to June 2, 2024. QOL, functional status, perceived social support, care satisfaction, and depression were measured using the Chinese versions of the World Health Organization Quality of Life Instrument—Older Adults Module (WHOQOL-OLD), Barthel Index, Multidimensional Scale of Perceived Social Support (MSPSS), Satisfaction with the Nursing Home Instrument (SNHI), and 15-item Geriatric Depression Scale (GDS-15), respectively. Descriptive statistics and multiple regression analysis were used for data analysis. The mean QOL score was 68.05 (SD = 9.60). The multiple regression analysis showed that perceived social support, care satisfaction, depression, functional status could explain 65.2% of the variance in QOL ($F(4, 142) = 66.972, p < 0.05$). The strongest predictor was perceived social support ($\beta = 0.786, p < 0.001$), followed by care satisfaction ($\beta = 0.728, p < 0.001$), depression ($\beta = -0.536, p < 0.001$), and functional status ($\beta = 0.110, p = 0.001$). These findings provided preliminary

evidence on factors influencing QOL among older adults in nursing homes. Interventions targeting social support, care satisfaction, depression, and functional status might help improve their QOL.

Keywords: Quality of life, Predictors, Older adults, Nursing homes

What was Known

- The quality of life (QOL) of older adults impacts the public health and social welfare systems, which is a key concern for the National Health Commission (NHC).
- The QOL among older adults in nursing homes was at a moderate level. Functional status, care satisfaction, perceived social support, and depression have been identified as significant factors predicting their QOL.

What's New and Next

- The QOL among older adults in nursing homes in Wenzhou has been underexplored, especially regarding the combined predictors of functional status, care satisfaction, perceived social support, and depression.
- This study provides new evidence on the key predictors of QOL among older adults in nursing homes in Wenzhou, China. It identifies perceived social support and care satisfaction as the strongest contributors to QOL, followed by depression and functional status, collectively explaining 65.2% of the variance in QOL outcomes.
- The findings from this study can inform nursing home management and public health policies aimed at enhancing the well-being of older adults through integrated psychosocial and functional support strategies.

Introduction

The world's population is aging at an unprecedented rate, due to significant increases in life expectancy and declining birth rates. According to the "Decade of healthy ageing: baseline report" by the World Health Organization (WHO), in 2020, the global population aged 60 years and over (older adults) is just over 1 billion people, representing 13.5% of the world's population of 7.8 billion¹. The percentage of people in the world 65 years or older is expected to increase from 10% in 2022 to 16% in 2050. Widespread population aging typically has many consequences, such as increased costs for households, pressure on public finances and health care providers, and slower economic growth. Therefore, population aging has become the focus of attention in various countries.

China's population is aging much faster than many low-, middle-, and high-income countries⁽²⁾. According to China's Seventh National Population Census, the population aged 60 and above reached 264 million in 2020, accounting for 18.7% of the total population and marking an increase of 5.4% from the previous census in 2010⁽³⁾. This confirms China's status as the country with the world's largest elderly population. As shrinking households, the empty-nest phenomenon, and the "growing old before growing rich" trend become more common, coupled with the high cost and limited availability of traditional family care, a growing number of older adults are moving to institutional care⁽²⁾. Consequently, their QOL has become a focus of close attention.

QOL in older adults is a multidimensional construct influenced by physical, psychological⁽⁴⁾. According to the WHO, QOL refers to an individual's perception of their position in life within the context of their culture and value systems, and in relation to their personal goals, expectations, standards, and concerns⁽⁵⁾. Various factors associated with QOL among nursing homes residents, include care satisfaction, social support, functional status, depression, loneliness, income, and health literacy level. For instance, high-quality nursing care services enhance environmental adaptation and reduce negative emotions⁽⁶⁾. A well-established social support system alleviates loneliness and financial pressure, both contributing to higher QOL in later years⁽⁷⁾. Higher levels of functional status enable older adults to participate more actively in social activities and improve health status⁽⁸⁾. The multifaceted impact of these factors underscores the complexity of healthy aging. This multidimensional view is consistent with the biopsychosocial model and the WHO healthy ageing framework.

Wenzhou, a major commercial and central regional city on the Southeast coast of China, is facing significant challenges related to population aging⁽⁹⁾. Nursing homes in Wenzhou are developing rapidly but still face challenges in service quality and individualized care. However, there is a lack of regional data on QOL and its influencing factors among nursing home residents in Wenzhou. This study was therefore designed to analyze QOL levels in this population and to examine the impact of various determinants. The findings aim to provide evidence to support local healthcare policymakers and public health researchers in developing targeted health management strategies for the older adult population. Additionally, the results may inform nursing practice by helping nurses identify at-risk residents and implement individualized interventions to improve care quality and resident well-being.

Materials and Methods

This is a cross-sectional study design. The older adults were defined as those aged 60 years and above who lived in nursing homes in Wenzhou, China. The data were collected through face-to-face interviews from March 1 to June 2, 2024.

Population

The study population comprised 14,074 older adults across 247 nursing homes. This total divided into 4,392 residents from 97 public nursing homes and 9,682 from 150 private nursing homes.

Samples

The required sample size was calculated a priori using G*Power software (latest ver. 3.1.9.7). For a linear multiple regression with four predictors, the parameters were set as follows: an alpha level of 0.05, a statistical power of 0.95, and a moderate effect size of 0.15⁽¹⁰⁾. The computation yielded a minimum of 129 participants. To compensate for potential missing data, the sample size was increased by over 10%, resulting in a final sample of 142 cases for data collection. The study sample was selected based on the following inclusion criteria: (1) a residency duration of at least six months in the nursing home; (2) no significant cognitive impairment, as indicated by a Mini-Mental State Examination (MMSE) score above the education-stratified cutoff (≥ 24 for college education or above, ≥ 23 for middle school education, ≥ 21 for primary school education, ≥ 18 for illiteracy)⁽¹¹⁾; (3) the ability to communicate effectively in spoken Mandarin Chinese or the Wenzhou dialect; and (4) willingness to participate and provide informed consent. Exclusion criteria comprised severe auditory or visual impairment that would hinder communication. A stratified random sampling method was employed, with nursing home ownership type (public vs. private) as the stratification variable. The sample of 142 older adults consisted of 44 participants from public nursing homes (total: 97 facilities, 4,392 residents) and 98 participants from private nursing homes (total: 150 facilities, 9,682 residents). The allocation was proportional to the resident population size in each stratum.

Data collection

This study was approved by the Burapha University Institutional Review Board (Approval No. G-HS108/2566), prior to data collection. A formal request letter from the Graduate School of Burapha University was submitted to the directors of the nursing homes to obtain permission for data collection. The study employed the MMSE, a 5–10 minutes screening tool, to identify eligible older adult participants. A total of 142 individuals who met the inclusion criteria were enrolled.

Following the provision of informed consent, data were collected via face-to-face interviews that lasted approximately 30 minutes. Upon completion, all questionnaires were reviewed for completeness, assigned identification numbers, and handled with strict confidentiality, with access restricted solely to the principal investigator.

Research Instruments

Prior to data collection, permission to utilize all instruments was secured from the original and Chinese version authors. Participants were screened for cognitive impairments with the MMSE. The questionnaire consisted of six parts as follows:

First part: Demographic characteristics 9 questions regarding age, gender, educational level, marital status, residence situation, care levels, number of chronic diseases, pensions, and type of nursing home.

Second part: The Chinese version of the World Health Organization Quality of Life Instrument—Older Adults Module (WHOQOL-OLD) was employed as a specialized tool to assess the QOL among the older adult population⁽¹²⁾. This instrument comprised 24 items categorized into six domains: Sensory Abilities (SAB), Autonomy (AUT), Past, Present and Future Activities (PPF), Social Participation (SOP), Death and Dying (DAD), and Intimacy (INT). Responses were recorded on a 5-point Likert scale, with a higher score representing a better QOL. The Cronbach's α for this study was 0.94.

Third part: The Chinese version of the Barthel Index was utilized to evaluate the functional status of the participants⁽¹³⁾. The scale encompasses 10 items related to mobility and self-care, such as feeding, bathing, grooming, dressing, bowel and bladder control, toilet use, transfers (bed to chair and back), mobility on level surfaces, and stair climbing. Scores range from 0 to 100, with the following interpretations: 100 signifies no dependency, 61–99 indicates mild dependency, 41–60 represents moderate dependency, and ≤ 40 denotes severe dependency. The Cronbach's α for this study was 0.89.

Forth part: The Chinese version of the Multidimensional Scale of Perceived Social Support (MSPSS) was administered to assess social support from three sources: family, friends, and significant others⁽¹⁴⁾. The total score ranges from 12 to 84, with higher scores indicating a greater level of perceived social support. Based on the author's recommendation, total scores were categorized into three levels: low (12–36), moderate (37–60), and high support (61–84). The Cronbach's α for this study was 0.89.

Fifth part: The Chinese version of the Satisfaction with the Nursing Home Instrument (SNHI) was employed to assess resident satisfaction⁽¹⁵⁾. This instrument requires 'yes/no' responses to all questions. A 'yes' response indicates satisfaction for positively phrased items, while the reverse is true for negatively worded questions. Each response indicating satisfaction was assigned one point, resulting in a total possible score ranging from 0 to 29, with higher scores denoting a greater level of satisfaction. The Cronbach's α for this study was 0.73.

Sixth part: The Chinese version of the 15-item Geriatric Depression Scale (GDS-15) was administered to screen for depressive symptoms⁽¹⁶⁾. This self-report instrument consists of 15 dichotomous (yes/no) items. Scores were interpreted as follows: 0–4 for no depression, 5–9 for mild depression, and 10–15 for severe depression. The Cronbach's α for this study was 0.78.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics version 22.0. Descriptive statistics (means, SDs, frequencies, percentages) were computed for all study variables. Prior to multiple linear regression analysis, assumptions including normality of residuals (Shapiro–Wilk test, P–P plot), linearity (partial regression plots), homoscedasticity (scatterplot of residuals), multicollinearity (variance inflation factor, $VIF < 10$), and independence of residuals (Durbin–Watson statistic) were tested and met. Multiple linear regression using the enter method was conducted to examine factors associated with QOL (WHOQOL-OLD total score), with functional status, perceived social support, care satisfaction, and depression entered as independent variables. A p -value < 0.05 (two-tailed) was considered statistically significant.

Results

A total of 142 older adults participated in the study. The majority (66.9%) were aged 80 years or older, and more than half (58.5%) were female. Approximately half (52.1%) had an educational level of primary school or below, and two-thirds were widowed (64.8%). Over half of the participants (57.8%) resided in studio apartments, the majority (58.5%) were self-managed, and 41.6% had one chronic disease. Regarding individual pensions, 26.8% received between RMB 3,001 and RMB 5,000, as detailed in Table 1.

Table 1 Demographic characteristics of the participants (n=142).

Characteristics	Number	Percentage
Age (yrs)		
60-69	11	7.7
70-79	36	25.4
≥80	95	66.9
mean 82.8, S.D. ±8.2, min-max 60-98		
Gender		
Female	83	58.5
Male	59	41.5
Educational level		
Primary school and below	74	52.1
Junior middle school	35	24.7
Senior high school	22	15.5
University and above	11	7.7
Marital status		
Single	3	2.1
Married	43	30.3
Divorced	4	2.8
Widowed	92	64.8
Residence situation		
Studio apartment	82	57.7
Twin or multiple room	60	42.3
Care levels		
Self-managed	83	58.5
Semi-managed	54	38.0
Full-time care	5	3.5

Table 1 Demographic characteristics of the participants (n=142) (Cont.)

Characteristics	Number	Percentage
Number of chronic diseases		
0	21	14.8
1	59	41.6
2-3	54	38.0
> 3	8	5.6
mean 1.6, S.D. $\pm$ 1.1, min-max 0-5		
Pensions (RMB)		
≤ 1000	26	18.3
1001-3000	32	22.5
3001-5000	38	26.8
> 5000	46	32.4
mean 3654.2, S.D. $\pm$ 2197.3, min-max 200-8000		
Type of nursing home		
Publicly run	44	31.0
Privately run	98	69.0

All QOL domains were measured on a 0-100 scale, where higher scores reflect better QOL. The average QOL score among the participants was moderate (Mean = 68.05). Among the six subdomains, past, present and future activities (PPF) had the highest mean score (78.43), suggesting that participants maintained relatively positive engagement with life activities. In contrast, death and dying (DAD) had the lowest mean score (60.39), indicating that concerns related to end-of-life issues were the most compromised aspect of QOL in this sample. Notably, the autonomy (AUT) and past, present and future activities (PPF) domains demonstrated less variability (SD = 11.42 and 9.25, respectively), while sensory ability (SAB) and intimacy (INT) scores showed greater dispersion among participants (SD = 16.65 and 15.18, respectively) (table 2).

Table 2 Description of QOL among older adults (n=142).

Variables	Possible score	Actual score	Mean	SD
Sensory ability (SAB)	0-100	25.00-100.00	63.73	16.65
Autonomy (AUT)	0-100	43.75-87.50	72.18	11.42
Past, present and future activities (PPF)	0-100	62.50-93.75	78.43	9.25
Social participation (SOP)	0-100	37.50-81.25	66.33	11.84
Death and dying (DAD)	0-100	31.25-75.00	60.39	8.12
Intimacy (INT)	0-100	25.00-100.00	67.25	15.18
Overall Quality of life (QOL)	0-100	44.79-85.42	68.05	9.60

Participants overall exhibited favorable profiles, as evidenced by high functional status (Mean = 83.06) and relatively low depressive symptoms (Mean = 4.75). Meanwhile, their levels of perceived social support (Mean = 53.09) and care satisfaction (Mean = 21.86) were in the moderate range (table 3).

Table 3 Description of study variables (n=142).

Variables	Possible score	Actual score	Mean	SD
Functional status	0-100	25-100	83.06	16.54
Perceived social support	12-84	39-71	53.09	5.97
Care satisfaction	0-29	10-28	21.86	3.43
Depression	0-15	0-11	4.75	3.85

The enter method was used for multiple regression analysis, with QOL as the dependent variable. The results showed that all the variables together explained 65.2% for the variance of QOL (with an adjust R^2 of 0.652). The significant predictors of QOL were functional status ($B=0.110$, $p=0.001$), perceived social support ($B=0.786$, $p<0.001$), care satisfaction ($B=0.728$, $p<0.001$), depression ($B=-0.536$, $p<0.001$) (table 4).

Table 4 Summary of multiple regression analysis of factors influencing QOL (n=142).

Variables	B	SE	β	t.	P-value
Functional status	0.110	0.031	0.189	3.513	0.001
Perceived social support	0.786	0.087	0.489	8.996	<0.001
Care satisfaction	0.728	0.152	0.260	4.779	<0.001
Depression	-0.536	0.137	-0.215	-3.909	<0.001

$R=0.813$, $R^2=0.662$, Adjust $R^2=0.652$, $F=66.972$.

Discussion

The QOL in this study was measured with a mean score of 68.05, indicating a moderate level among older adults in nursing homes. This finding aligned with the conclusions of prior research^(17, 18), which reported generally favorable QOL among elderly nursing home residents.

Of the participants, 66.9% were over 81 years of age. Advanced age was generally associated with a gradual decline in social adaptability and physical functioning, which may negatively affect QOL⁽¹⁷⁾. Additionally, approximately half (52.1%) had only a primary school education or less, a factor that could hinder effective communication and comprehension of health information, thereby restricting social participation and access to health resources⁽¹⁹⁾. Widowhood was another prevalent characteristic, reported by 64.8% of the older adults. The absence of spousal support had been linked to higher risks of depressive symptoms due to reduced emotional and communicative interaction, which might further contribute to diminished QOL⁽²⁰⁾. Furthermore, chronic diseases were highly prevalent, affecting 85.2% of the participants. These conditions often led not only to physical discomfort but also to considerable financial and psychological burdens. In more severe cases, complications could impair self-care capacity, substantially compromising QOL⁽¹²⁾. Conversely, approximately 58.5% of the participants retained self-management ability, which was associated with greater independence, sustained social engagement, and better psychological well-being⁽²¹⁾. Similarly, financial stability—reported by 59.2% of the participants who received a monthly pension of at least 3,000 yuan—was shown to improve QOL by alleviating economic pressure on older adults and their families, while also expanding options for institutional care⁽⁷⁾.

In this study, the QOL scores for past, present, and future activities were the highest, while those for death and dying were the lowest. The results indicated that the participants were at a good level in the past, present, and future activity domain. This suggested that older people were satisfied with what they had achieved in life and were looking forward to the future. The results of this study were not consistent with other studies that had found that scores tend to be low in the past, present and future activity domain⁽¹⁸⁾. It was possible that the traditional culture and ideas represented by Confucianism, Buddhism, and Taoism permeated every aspect of the lives of the Chinese people, resulting in the character of the older adults who were contented with what they had⁽¹⁸⁾. Conversely, the results indicated that the participants were at a poor level in the death and dying domain. This was consistent with previous findings⁽²²⁾. Traditionally, death was a sensitive subject, often considered taboo, and it was considered unlucky to discuss it directly in China⁽²³⁾.

The results of this study confirmed that perceived social support had a significant positive effect on QOL, it was one of the predictors of QOL. The finding was similar to a study done in India, there was a significant positive correlation between QOL and the perceived social support⁽²⁴⁾. Social support is defined as various forms of assistance or aid received from family, friends, and other social connections, and it is a critical determinant of QOL⁽²⁵⁾. Due to the influence of traditional Chinese culture, family relationships are indispensable and often become an important form of social support for older adults⁽²⁶⁾. Older adults can receive practical material support and emotional comfort from their families, which greatly reduces their inner loneliness and financial stress, which improves their mental health. In addition, professional caregivers such as doctors, nurses, and clerks, as well as partners or other supportive individuals, play a crucial role in providing assistance that complements family support. Consistent with a survey of 205 elderly Chinese rural nursing home residents, perceived social support has been shown to have a significantly positive effect on QOL⁽²⁷⁾. In conclusion, these combined results support the idea that strong social support systems, which included connections with friends, family, and significant others, are essential to raising the general QOL of the elderly residents.

Care satisfaction was the second factor predicting QOL. This finding aligns with von der Warth et al.'s QOL study, which identified nursing care satisfaction as the strongest predictor of QOL⁽²⁸⁾. When the elderly left their families and chose to live in an institution, they had high expectations of the members of the institution and the conditions of its facilities and equipment, just as they would have if they had chosen to live in a new home. The service attitude, skill level, and service staffing ratio of service personnel, as well as the conditions of facilities and equipment in elderly care institutions, affected the QOL of the elderly residents⁽²⁹⁾. If the elderly residents perceived that they were surrounded by caring people in a person-centered environment, they adjusted better to the environment and, in particular, experienced less negative emotional distress and had a better QOL. This environment included staff who were supportive, maintained positive attitudes, helped residents feel welcome, and enabled residents to easily talk to staff about their feelings and experiences while allowing them to ask for additional help when needed. Although one study reported a weaker correlation using staff-rated QOL⁽³⁰⁾, our results, together with those of von der Warth et al., support a positive association between care satisfaction and self-perceived QOL among nursing home residents.

Among the current set of predictors, depression was also significant in predicting QOL. In this study, the mean depression score was 4.75, which was close to the threshold (5.00), indicating

that overall depressive symptoms were mild in older adults, but some individuals had reached mild levels of depression. This result was similar to the results of a Chinese study of depression in elderly nursing home residents⁽⁶⁾. A possible reason for this finding that two-thirds of the participants was over 81 years of age could be that older adults tend to have reduced activity levels due to declining physical function. Moreover, the older adults in nursing homes may experience sadness, loneliness, and boredom because of the monotonous routine and institutional atmosphere. Consistent with previous studies^(22,31), the results of this study demonstrated a progressive decline in QOL corresponding to elevated depression levels among elderly populations.

Functional status was also significant in predicting QOL. The higher the ability of the functional status, the higher the level of QOL of the elderly residents. The results of this study were also consistent with the research results carried out by Wang in Singapore, who reported that the elderly residents who were less independent in their daily lives had poorer QOL in terms of autonomy⁽³²⁾. A study in Turkey also used the score of ADL as an indicator of QOL, demonstrating that significant positive associations were observed across all QOL domains⁽⁸⁾. Consistent with a study by Medhi et al. in India, functional status was strongly and positively associated with HRQOL among older adults⁽³³⁾. Numerous studies have shown that the functional status is the basis and important influencing factor of QOL.

This study boasts a key strength: it employs the WHOQOL-OLD instrument, which is psychometrically robust, for assessing the QOL of older adults residing in nursing homes, thus upholding strict methodological standards⁽¹²⁾. Nevertheless, it is important to consider several limitations of this study. First, the cross-sectional design precludes the establishment of causal relationships between the variables. Second, the limited sample size constrains the statistical power of the study and restricts the generalizability of the findings to the broader population of nursing home residents in China. Third, as all participants were older adults from China, the results are likely shaped by cultural and the local pension system, reducing their direct applicability to other settings. Despite these limitations, these findings highlight the importance of multidimensional interventions that address psychological, social, and functional factors to improve the quality of life among older adults in nursing homes. Enhancing care satisfaction, reducing depressive symptoms, and fostering social support should be key priorities for nursing home management and policy development.

Conclusion

This study examined factors predicting the QOL among nursing home residents. It demonstrated that functional status, perceived social support, depressive symptoms, and care satisfaction significantly impacted QOL. Furthermore, the evidence generated from this study may inform nursing practice and guide the development of evidence-based strategies to improve QOL in long-term care settings.

Ethical Approval Statement

This research was approved by the Burapha University Institutional Review Board, on January 22, 2024, under project code G-HS108/2566.

Author Contributions

All authors contributed significantly to this work. LR and PL were involved in the study design, data collection, data analysis, and writing of the main manuscript text. PL, and PH contributed to the study design, discussion, as well as the editing and revision of the manuscript.

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Conflicts of Interest

The authors have no conflicts of interest to declare.

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