# Quality of life of Chinese older adults treated in primary care of Wuhan, China: a multi-center study (#34439)



First submission

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# Quality of life of Chinese older adults treated in primary care of Wuhan, China: a multi-center study

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**Background.** Quality of life (QOL) is an important primary care outcome, but the QOL of older adults (OAs) treated in primary care is understudied in China. This study examined the level and correlates of QOL in OAs treated in Chinese primary care. **Methods.** A total of 752 OA patients (65+ years) were consecutively recruited from 13 primary care centers in Wuhan, China, and interviewed with a standardized questionnaire, concerning socio-demographics, major medical conditions, loneliness, and depression. QOL and depression were measured with the Chinese six-item QOL scale and the shortened Geriatric Depression Scale. Multiple linear regression was used to identify correlates of poor QOL. **Results.** The average QOL score of primary care OAs was (20.7±2.5), significantly lower than that of the Chinese general population. Significant correlates poor QOL of Chinese primary care OAs included engaging in manual labor before older adulthood (unstandardized coefficient [β]: -0.702, P<0.001), no living adults children (β: -1.720, P=0.001), no exercise habit (β: -0.696, P<0.001), having ≥four major medical conditions (β: -1.813, P<0.001), hearing problem (β: -1.004, P=0.017), depression (β: -1.153, P<0.001), and loneliness (β: -1.396, P<0.001). **Conclusions.** OAs of Chinese primary care have poorer QOL. Addressing psychosocial problems at Chinese primary care settings is helpful in improving QOL of Chinese OAs.

# Quality of life of Chinese older adults treated in primary care of Wuhan, China: a multi-center study

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## Abstract

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## Introduction

In China, the unprecedented social changes during the past four decades have posed significant challenges to the health and well-being of older adults (OAs): decreased family size, weakened traditional family cohesion, changes in living arrangements, rapid economic growth, fast urbanization and industrialization, and massive rural-to-urban migration (Yu et al. 2016; Zhong et al. 2018a). China is ageing much faster than almost any other country in the world in recent history, and, until now, it has been the nation with the largest number of elderly population. In 2017, the total number of Chinese OAs (65+) had reached 158.31 million, over one-tenth of China's total population, and by 2050, this number will reach 336 million, nearly one-third of the total population (National Bureau of Statistics of China 2018; Zhong et al. 2016a). However, the infrastructure of China has not been prepared to meet OAs' growing needs for healthcare and social services.

To solve the contradiction between increasing demands for healthcare services and limited medical services resources, China's healthcare reform since 1994 has focused on strengthening its primary health-care system and made substantial progress (Li et al. 2017). For example, in rural regions of China, where there are insufficient healthcare resources, in 2017, each village had 1.14 primary care clinics and 2.3 health workers on average (China National Health and Family Planning Commission. 2018). In China, because distance and transportation from home to health facility are two major determinants of OAs' preferred choice of health facility for care, 53.6% urban OAs seek treatment at community primary care centers unless they are seriously ill (Han & Jin 2016). Due to the inconvenient transportation ~~of~~ rural regions, ~~rural Chinese OAs should be more likely to seek treatment at village primary care clinics~~. Therefore, primary care has been very well-placed to provide healthcare services for Chinese OAs.

Although the bio-psychosocial model has dominated medical practice for many years, medical services provided by primary care in contemporary China are still quite very basic, largely limited to disease treatment (Liang et al. 2018). Late life is a period ~~of~~ increasing ~~and multiple~~ psychosocial problems such as cognitive decline, depression, and loneliness (Zhong et al. 2017). Due to unawareness of the importance of mental health services and insufficient capacity in managing psychosocial problems, Chinese OAs ~~of~~ primary care have greater unmet late-life needs for psychosocial services (Sun et al. 2018). Accordingly, the World Health Organization

(WHO) advocated the integration of mental health services into primary healthcare, particularly in low- and middle-income countries such as China (Ventevogel 2014).

Quality of life (QOL) is an important outcome measure of health-care practice, which is defined as a sense of well-being that encompasses physical, role functioning, social, and psychological aspects and functioning (Gu et al. 2018; Post 2014; Yu et al. 2016). To overcome the limitation of disease-centered treatment in Chinese primary care, it is necessary to include QOL as an important therapeutic target of primary health-care. Therefore, examining the ~~level and correlates of QOL~~ in ~~primary care OAs~~ is the first necessary step towards health policy-making. However, although QOL of Chinese elderly has been extensively studied, most existing studies focused on QOL of community- and institution-dwelling OAs (Chen et al. 2013; Xiao et al. 2017; Zhu et al. 2018), and~~,~~ as far as we know, few studies have investigated QOL of OAs who seek treatment at Chinese primary care settings. This study was set out to investigate QOL and its associated factors in OAs treated in Chinese primary care.

## Materials & Methods

### Participants

This was part of a large-scale cross-sectional multi-center study, which investigated a range of mental health outcomes, QOL, and loneliness among older primary care patients in Wuhan, China, the largest metropolitan city with over ten million residents in central-south China, from October 2015 to November 2016 (Zhong et al. 2018a). Wuhan is divided into 13 districts (seven urban and six rural), with populations ranging from 0.21 to 1.34 million. Considering the geographic representativeness of the study sample, we consciously selected one primary care center from each district, which was located near the center of the most populous area of the district. OAs who were 65 years old or over and sought treatment at these primary care centers, were consecutively invited to participate in this study. We excluded OA patients who were unable to complete the interview due to severe physical illnesses and severe cognitive impairment, as well as those with psychotic disorders.

The study was approved by the Institutional Review Board of Wuhan Mental Health Center (approval number: WMHC-IRB-S065). All participants signed the informed consent before the interview.

### Procedures and instruments

This was a questionnaire survey. Before the main study, the questionnaire was pilot-tested and finalized. The questionnaire was distributed in a face-to-face interview manner. Interviewers were trained primary care physicians (PCPs) ~~of~~ the 13 primary care centers.

Demographic variables collected in the questionnaire included gender, age, education, marital status, occupation before older adult hood (mental vs. manual labor), residence location (urban vs. rural), living arrangement (with family members, alone, with others), total number of living adult children, smoking behavior, and exercise habit.

Currently smoking was defined as smoking at least one cigarette per day on at least five days per week (Zhong et al. 2018a). Subjects who regularly participated in physical exercise were defined as having exercise habit.

A checklist was used to collect data on patients' major medical conditions, which included 13 specific physical illnesses: hypertension, diabetes, heart disease, stroke and other cerebrovascular diseases, chronic obstructive pulmonary disease, cancer, tuberculosis, chronic prostatitis, chronic gastric ulcer, Parkinson's disease, anemia, hepatic sclerosis, and arthritis.

The presence of hearing and vision problems was operationally defined by the authors (Zhong et al. 2018a). Hearing problem was present if the interviewer must speak at a louder volume than usual to help the interviewee hear questions clearly, while vision problem was present if the respondent reported having difficulties in seeing TV or movies.

Depressive symptoms were assessed with the validated Chinese shortened version of Geriatric Depression Scale (GDS), which had 15 items and all were answered in a yes/no format (D'Ath et al. 1994; He et al. 2008; Liu et al. 2013). The total score of GDS ranged from zero to 15, with a cut-off score of five or more suggesting clinically significant depression.

In accordance with previous studies (Dahlberg et al. 2015; Victor et al. 2005; Zhong et al. 2017; Zhong et al. 2018a; Zhong et al. 2018b), feelings of loneliness were assessed with one single question: "How often do you feel lonely?". The question was responded on a five-point Likert scale: 1=always, 2=often, 3=sometimes, 4=seldom, 5=never. Loneliness was present if the answer was "sometimes", "often", or "always".

The outcome of this study, QOL, was evaluated with the Chinese six-item QOL ~~scale~~, which was developed by Phillips and colleagues (Phillips et al. 2002) and has been widely used to assess the QOL of various populations in China, including OAs (Dong et al. 2013; Liu et al. 2013; Wu et al. 2017; Ye et al. 2013; Zhang et al. 2012). The ~~scale~~ had six questions and each

assessed one domain of QOL (physical health, psychological health, economic circumstances, activities, family relationship, and relationships with non-family associates) on a five-point scale: 1=very poor, 2=poor, 3=fair, 4=good, 5=very good. The total QOL score varied between five and 30, with higher score denoting better QOL. In this study, the internal consistency (Cronbach α coefficient) of this QOL ~~scale~~ was 0.827.

**Statistical analysis**

The average QOL score was calculated. One-sample t-test was used to compare QOL between primary care OAs and the normative data which was derived from a very large representative sample (n=23987) of Chinese general adult population (Zhang et al. 2012). QOL scores of different OA cohorts according to demographic, clinical, and psychosocial characteristics were compared with independent-samples t-test or one-way analysis of variance (ANOVA) as appropriate. Multivariable linear regression analysis that entered all statistically significant variables in the above univariate analysis as independent variables and QOL score as the outcome variable was conducted to examine factors associated with QOL. Factors were selected with a backward stepwise method. Data analyses were conducted with SPSS version 17.0. The statistical significance level was set at $p<0.05$ (two-sided).

## Results

Altogether, 791 OAs treated in primary care were invited to join the study. Among them, ten rejected, 15 were excluded due to severe cognitive impairment, six withdrew informed consent, and eight had missing values on variables of interest of the current analysis. A final sample of 752 OAs were included into the current analysis.

Mean age of the final sample was 73.0 years (standard deviation [SD]: 6.1, range: 65-97), and 53.9% were women. Other demographic, clinical, and psychosocial characteristics are displayed in Table 1.

The average QOL score of the whole sample was 20.7 (SD: 2.5), without significant gender difference (males vs. females: 20.7 [SD: 2.5] vs. 20.6 [SD: 2.5], t=0.178, P=0.859). Primary care OAs had statistically significant lower QOL score than the normative data of Chinese general population (20.7 vs. 23.0, t=25.475, P<0.001).

Results of univariate analysis (Table 1) show that QOL scores were significantly lower in OAs who were illiterate, had marital status other than married, engaged in physical labor before older

adulthood, lived alone or with others, had no living adult children, did not exercise regularly, suffered from four or more major medical conditions, had hearing problem, were depressed, and felt lonely (P≤0.001).

In multiple linear regression analysis (Table 2), factors significantly associated with poor QOL were engaging in manual labor before older adulthood (unstandardized coefficient [β]: -0.702, P<0.001), no living adults children (β: -1.720, P=0.001), no exercise habit (β: -0.696, P<0.001), having ≥four major medical conditions (β: -1.813, P<0.001), hearing problem (β: -1.004, P=0.017), depression (β: -1.153, P<0.001), and loneliness (β: -1.396, P<0.001).

## Discussion

In recent decades, QOL has been increasingly emphasized as an important health care outcome, but it remains a neglected area for public policy of Chinese primary health-care system. To the best of our knowledge, this is the first study investigating QOL of OAs treated in primary care. In our study, a poorer QOL in Chinese primary care OAs as compared to the general population was found. Because these primary care OAs all had physical illnesses, a poorer QOL ~~of OAs in primary care~~ is expected. Further, because aging is often related to a decreasing social network, reduced income and poor health (Yu et al. 2016), the subjective well-being of OAs is vulnerable to functional disabilities and psychosocial problems. As evident in our study, the prevalence of vision problem, depression, and loneliness in Chinese primary care OAs were as high as 10.1%, 30.6%, and 26.2%, respectively (Table 1).

This study identified a number of demographic, clinical, and psychosocial ~~correlates of~~ QOL in OAs treated in Chinese primary care. Since elderly women are more likely to experience functional impairment in mobility and psychosocial problems, QOL of OAs is generally lower in women than men (Hajian-Tilaki et al. 2017). However, we found similar levels of QOL between males and females, which is possibly due to the prevailing physical illnesses of the study sample-masking the effect of gender. Previous population-based studies have reported ~~the~~ significant association between ~~a~~ low socio-economic status and poor QOL (Brennan et al. 2013; Lam et al. 2017). Because Chinese OAs who previously engaged in manual labor during their working age were often farmers and temporary workers of labor-intensive factories, and contemporary China's social welfare system is still unsound, few of these people have old-age pensions. The significant link between manual labor before older adulthood and poor QOL in our study could

be attributed to the low economic status of OAs who previously made their living by physical labor. In traditional Chinese culture, adult children are a major source of social support ~~of~~ ~~Chinese~~ OAs (Zhong et al. 2016b). Since social support plays an important role in buffering against the negative effects of stress, and protecting against physical and mental morbidities (Gu et al. 2018), the relationship between no living adult children and poor QOL in our study might be explained by insufficient social support ~~of~~ OAs without adult children. Similar to the beneficial effect of physical exercise on QOL (Tavares et al. 2014), we found ~~the~~ significant association of no exercise habit with poor QOL.

Considering the associations between major medical conditions and poor physical QOL, and between hearing problem and impaired daily functioning, the significant contributions of more major medical conditions and hearing problems to QOL of primary care OAs is expected (Gopinath et al. 2012). The theory of QOL satisfaction model argues that unmet social needs are an important cause of reduced QOL (Gu et al. 2018). Consistent with this theory, loneliness was found to be significantly associated with poor QOL in this study. Given the many deleterious effects of depression on both physical and mental health (Zhong et al. 2015), it is reasonable to find the significant association of depression with poor QOL. Overall, our findings on these physical and psychosocial correlates of poor QOL are consistent with previous studies (Cao et al. 2016; Chen et al. 2013; Gu et al. 2018; Zhu et al. 2018). However, due to no psychosocial services provided in Chinese primary care, the negative effects of untreated loneliness and depression on QOL of OAs should be more substantial.

The present study has several limitations. First, this is a cross-sectional study, so the causality of associations between poor QOL and its correlates could not be ascertained. Prospective studies are warranted to confirm these relationships. Second, due to our limited research budget, no age- and gender-matched community-residing elderly controls were recruited. QOL comparison was made with the reported normative Chinese data. Third, we recruited OAs from primary care centers of only one city in China; primary care OAs of other cities were not included, particularly those from economically underdeveloped regions of China. We need to be cautious in generalizing our findings.

## Conclusions

In summary, OAs treated in Chinese primary care have poorer QOL than the general population in China. A variety of factors, particularly psychosocial problems, are significantly associated

with poor QOL in Chinese primary care OAs. Given that psychosocial problems are preventable or modifiable, psychosocial services ~~are~~ helpful for improving QOL of Chinese OAs in primary care settings. The significant associations of poor QOL with physical and psychosocial factors suggest that in addition to conventional disease treatment for OAs, it is necessary to integrate psychosocial services into Chinese primary health-care. Such services for OAs may include the recognition of psychosocial problems, mental health education and promotion, psychosocial support, and when necessary, psychiatric referral and consultation.

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## Table 1(on next page)

Table 1

Characteristics of Chinese older adults treated in primary care and quality of life (QOL) scores by variable

**Table 1. Characteristics of Chinese older adults treated in primary care and quality of life (QOL) scores by variable**

| Characteristics | | Number of older adults | % | QOL score (mean ± standard deviation) | t/F | P |
|---|---|---|---|---|---|---|
| Gender | Male | 347 | 46.1 | 20.7±2.5 | 0.178 | 0.859 |
| | Female | 405 | 53.9 | 20.6±2.5 | | |
| Age (years) | 65-74 | 484 | 64.4 | 20.7±2.5 | 1.263 | 0.207 |
| | 75+ | 268 | 35.6 | 20.5±2.6 | | |
| Education | Illiterate | 177 | 23.5 | 20.1±2.5 | | |
| | Primary school | 213 | 28.3 | 20.3±2.4 | | |
| | Junior middle school | 212 | 28.2 | 20.9±2.4 | 10.974 | <0.001 |
| | Senior middle school and above | 150 | 19.9 | 21.5±2.6 | | |
| Marital status | Married | 534 | 71.0 | 20.9±2.4 | 3.414 | 0.001 |
| | Others* | 218 | 29.0 | 20.2±2.7 | | |
| Main occupation before older adulthood | Mental labor | 216 | 28.7 | 21.4±2.5 | 5.461 | <0.001 |
| | Manual labor | 536 | 71.3 | 20.3±2.5 | | |
| Residence place | Urban | 403 | 53.6 | 20.7±2.6 | 0.905 | 0.366 |
| | Rural | 349 | 46.4 | 20.6±2.4 | | |
| Living arrangement | With family members | 637 | 84.7 | 20.8±2.5 | 15.229 | <0.001 |
| | Alone | 81 | 10.8 | 20.1±2.6 | | |
| | With others | 34 | 4.5 | 19.2±2.1 | | |
| Number of living adult children | 0 | 19 | 2.5 | 17.7±2.2 | 5.854 | <0.001 |
| | ≥1 | 733 | 97.5 | 20.7±2.5 | | |
| Currently smoking | No | 631 | 83.9 | 20.6±2.5 | 0.283 | 0.777 |
| | Yes | 121 | 16.1 | 20.7±2.5 | | |
| Exercise habit | No | 326 | 43.4 | 20.1±2.6 | 5.447 | <0.001 |
| | Yes | 426 | 56.6 | 21.1±2.4 | | |
| Number of major medical conditions | ≤3 | 680 | 90.4 | 20.9±2.5 | 9.695 | <0.001 |
| | ≥4 | 72 | 9.6 | 18.7±1.7 | | |
| Hearing problem | No | 722 | 96.0 | 20.7±2.5 | 3.335 | 0.001 |
| | Yes | 30 | 4.0 | 19.2±2.5 | | |
| Vision problem | No | 676 | 89.9 | 20.9±2.5 | 1.050 | 0.294 |
| | Yes | 76 | 10.1 | 20.6±2.5 | | |
| Depressive symptoms | No | 522 | 69.4 | 21.2±2.3 | 8.898 | <0.001 |
| | Yes | 230 | 30.6 | 19.4±2.6 | | |
| Loneliness | No | 555 | 73.8 | 21.2±2.2 | 9.524 | <0.001 |
| | Yes | 197 | 26.2 | 19.1±2.8 | | |

*"Others" included never-married, separated, divorced, widowed, cohabitating, and remarried.

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## Table 2(on next page)

Table 2

Multiple linear regression of factors significantly associated with poor quality of life

1 **Table 2. Multiple linear regression of factors significantly associated with poor quality of life**

| Variable | Risk level | Reference level | Coefficient | Standard error | t | P |
|---|---|---|---|---|---|---|
| Main occupation before older adulthood | Manual labor | Mental labor | -0.702 | 0.176 | 3.986 | <0.001 |
| Number of living adult children | 0 | ≥1 | -1.720 | 0.510 | 3.372 | 0.001 |
| Exercise habit | No | Yes | -0.696 | 0.163 | 4.279 | <0.001 |
| Number of major medical conditions | ≥4 | ≤3 | -1.813 | 0.281 | 6.457 | <0.001 |
| Hearing problem | Yes | No | -1.004 | 0.421 | 2.384 | 0.017 |
| Depressive symptoms | Yes | No | -1.153 | 0.180 | 6.420 | <0.001 |
| Loneliness | Yes | No | -1.396 | 0.19 | 7.336 | <0.001 |

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