Received: 8 February 2018 | Accepted: 13 February 2018

DOI: 10.1002/agm2.12009

REVIEW ARTICLE

WILEY Aging Medicine Open Access

# Epidemiology of chronic noncommunicable diseases and evaluation of life quality in elderly

Jiang B. Gong[1] | Xiao W. Yu[1] | Xiang R. Yi[2] | Chong H. Wang[3] | Xi P. Tuo[1]

[1]Department of Geriatrics, First Affiliated Hospital of Second Military Medical University, Shanghai, China

[2]Institute of Physical Education, Shandong University, Jinan, China

[3]Quality of Life and Applied Psychology Research Center, Institute of Humanity and Management, Guangdong Medical College, Dongguan, China

**Correspondence**
Xi P. Tuo, Department of Geriatrics, First Affiliated Hospital of Second Military Medical University, Shanghai, China.
Email: xptuo_01@126.com

## Abstract

Chronic noncommunicable diseases (NCDs) are the leading cause of death, accounting for 70% of global deaths. Also referred to as chronic diseases, NCDs mainly include cardiovascular disease (such as heart disease and stroke), cancer, chronic respiratory disease (such as chronic obstructive pulmonary disease and asthma), and diabetes. The incidence of NCDs is rising over time, becoming one of the most important threats to human health. As a measurement of quality of life, scales can reflect the entire health status of patients. But there are still many disadvantages in the multidimensional health status of elderly patients with chronic diseases, so it is of great significance to develop a simple and practical multidimensional health scale of good reliability and validity for chronic diseases in the elderly.

**KEYWORDS**
chronic noncommunicable diseases, elderly, quality of life

## 1 | PREVALENCE OF CHRONIC NONCOMMUNICABLE DISEASES IN THE ELDERLY POPULATION

According to a 2015 report by the National Health and Family Planning Commission,[1] the mortality rate of chronic noncommunicable diseases (NCDs) in 2012 was 533/10 million, and NCDs accounted for 86.6% of the total deaths. The main causes of death—cardiovascular disease, cancer, and chronic respiratory disease—accounted for 79.4% of total deaths. The mortality rate was 271.8/10 million due to cardiovascular and cerebrovascular disease, 144.3/10 million due to cancer (the top five being lung, liver, gastric, esophageal, and colorectal cancer), and 68/10 million due to chronic respiratory disease. After standardization, most mortality of NCDs declined, except for a small number of diseases such as coronary heart disease and lung cancer. The prevalence and mortality of NCDs are closely related to economy, society, population, behavior, environment, and so forth. On the one hand, because of continuous improvements in quality of life (QOL) and health care, the number of patients with NCDs in China is increasing along with the per capita life expectancy and elderly population. On the other hand, thanks to the deepening reform of the medical and health system, the survival time of NCD patients is also increasing with the growing demand for medical and health services by urban and rural residents, and the higher level of public health and medical services. Both the rise of NCD prevalence and the decline in mortality reflect the promotion of national socioeconomic condition and health care, and are the inevitable result of the improvement of the national standard of living and prolonged life span. However, we still need to be aware of what unhealthy lifestyles may bring to the pathogenesis of NCDs. Considering the aging population and social factors such as smoking, the present situation and trend of risk is still grim, posing great challenges to NCD prevention and control in China.

The prevalence of NCDs in the elderly over 65 years of age in China was 65.4%, according to the 2013 National Health Statistics Yearbook.[2] The data were also broken down by regions. A survey conducted by by Gu et al[3] in Hebei Province showed that the prevalence of NCD in the elderly was 75.1%, with three or more NCDs accounting for 38.6%. In Hubei Province, a study by Pan used the stratified cluster sampling method to select 8358 people aged 60 and above with a mean age of 68.5 ± 7.1 years, including 3738 citizens (44.7%) and

4092 males (49%).[4] In the study, 6169 (73.8%) suffered from NCDs. Li et al[5] used random cluster sampling to survey the elderly in eight communities in Nanning City in the Guangxi region. A total of 1526 people were randomly sampled with 1476 valid questionnaires. The prevalence of NCDs was 71.2 l%, of which 68.6% of the men and 74.2% of the women suffered from NCDs ($P > .05$).

Retired cadres are relatively special among the elderly groups. Sun et al[6] conducted a survey of 767 retired cadres from 30 military sanatoriums in Anhui Province and found that the prevalence of NCDs was 91.53%, while other studies on retired cadres revealed 98.6%-100% of NCD prevalence, in which 87.3%-96.2% of elderly have two to 12 kinds of NCDs.[7,8] Thus, retired cadres are more likely to be suffering from multiple chronic diseases than other elderly groups.

## 2 | REVIEW OF COMMON QUALITY-OF-LIFE MEASUREMENT SCALES

Increasing in prevalence with age, NCDs are a serious threat to human health.. Developing and promoting suitable measurement scales of NCDs are core in determining and positively affecting QOL in a timely manner.

### 2.1 | Katz index of independence in activities of daily living (Katz ADL)[9]

This Index assesses adequacy of performance in six daily activities: bathing, dressing, toileting, transferring, continence, and feeding. These are slightly adapted into physical ADL and instrumental ADL. Physical ADL is the basis for maintaining physical activity, and instrumental ADL for maintaining community activities such as shopping,, making a telephone call, and so on. ADL is mainly used to assess NCD patients and the elderly population.

### 2.2 | Nottingham health profile (NHP)[10]

Established in Nottingham, UK, in the 1970s, the purpose of NHP is to assess individuals' health needs and outcomes in two parts. The first part reflects problems with health, containing 38 statements focusing on six areas: sleep, physical mobility, energy, pain, emotional reactions, and social isolation. The second part examines the health effects on daily life in seven areas: paid employment, housework, social life, personal relationships, sex life, hobbies and interests, and holidays.

### 2.3 | Linear analogue self-assessment (LASA) Scale[11]

The LASA scale, the most used assessment for QOL in breast cancer patients, includes ten items. One of the advantages of the LASA scale is allowing patients to make the gestalt combination for subcontructs. LASAs also provide dimensional constructs in numerous settings, requiring subjects to mark each item on the 0-10 scale (0 being as bad as can be, 10 being as good as can be).

### 2.4 | The functional living index-cancer (FLIC)[12]

For self-assessment of the QOL of cancer patients, and as a screening tool for identifying specific dysfunctions, this Index includes 22 items to evaluate physical and social ability, role performing, emotional status, positive symptoms, and subjective feelings. This Index is more suitable for some cancer patients with better prognosis. Each answer should be marked on a 1-7 scale. The English version of FLIC was translated into and published in Chinese.

### 2.5 | 36-Item short form survey (SF-36)[13]

As part of the Medical Outcomes Study (MOS), SF-36 is a multiyear, multisite study developed by RAND to explain variations in patient outcomes. SF-36 is a set of generic, coherent, and easily administered quality-of-life measures. These measures rely upon patient self-reporting and are now widely utilized by managed care organizations and by Medicare for routine monitoring and assessment of care outcomes in adult patients. The American Standard Version and the English Developed Version are the most used, assessing eight health concepts—physical functioning, bodily pain, role limitations due to physical health problems, general health perceptions, energy/fatigue, social functioning, role limitations due to personal or emotional problems, and emotional well-being. In 2002, Li et al[14] carried out the development of the Chinese version of the SF-36 health survey.

## 3 | MEASURING QUALITY OF LIFE OF OLDER NCD PATIENTS

Now, NCDs are becoming an important health issue in the elderly, with obvious daily life dysfunctions and effects on QOL. Defined by the World Health Organization in 1993, QOL is an individual's experience of living conditions in relation to their goals, expectations, standards, and matters concerned.[15] Compared to previous evaluation indicators, QOL is more comprehensive in reflecting the health situation of patients. At present, the assessment tools for the quality of life in elderly and even those with chronic diseases are mainly scales, including the universal scales and the specific scales. The SF-36 health survey has received international recognition, as well as the world health organization quality of life instrument-older adults module, ADL, mini-mental state examination, and so on. The specific scale of QOL evaluation for NCD patients is being developed at present in China and abroad based on the modern development scale method, namely the combination of the common module and the characteristic module.

According to the specific module scale developed separately for each disease, the common module and the specific module were combined to form the corresponding scale for evaluating each disease. Wan et al[16] have developed a system to measure the QOL of chronic patients in China.

However, there are still some difficulties in evaluating the multidimensional health of older patients with NCDs. Some scales, although suitable for the whole population, are not very pertinent to the

elderly, and although some scales can be applied to the elderly, they do not involve all aspects of the health status of elderly patients with NCDs, so they cannot comprehensively evaluate their health. Although some tools that examine several aspects of the health status of elderly NCD patients do exist, the questionnaire items are too many, and are unsuitable especially for the older patients.

So far, the evaluation of the QOL of population is still based on subjective indexes, however the objective indexes should also be considered for their changes seriously affecting the QOL. The clinical objective index consists of mainly three major routines (blood, urine, and stool), blood biochemistry, and indexes specific to various diseases. Yang et al found that injuries affecting lung function was negatively correlated with the long-term QOL.[17] The study had 1356 cases of detection of pulmonary function test in patients with QOL after 9 years, it was found in age and gender, FEVl% was significantly correlated with QOL patients in the general situation, physical activity, independence and psychological field score, score and domain independent social activities. However there are studies with opposite results.[18,19] Zhang's study on patients with diabetes showed that different clinical objective indicators had certain effects on the scores of all fields of QOL, and clinical objective indicators could reflect QOL of NCD patients to a certain extent.[20] At present, not much research has been done on the correlation between clinical objective indicators and QOL. Clarifying this correlation in the elderly can provide a scientific basis for better QOL.

In summary, the base population of patients with NCDs is huge, and the prevalence rate is increasing annually. The elderly is in the high-risk population for NCDs, among which retired cadres face a higher prevalence rate of chronic diseases and proportion of various diseases than the general elderly. The existing scale has many drawbacks in the comprehensive evaluation of the multidimensional health status of the elderly patients, including retired cadres, so it is of great significance to develop a simple and practical multidimensional health scale for the elderly with good reliability and validity. When evaluating the elderly QOL, we should combine the clinical objective indicators to clarify the correlation between the common clinical objective indicators and the elderly QOL, which can provide a scientific basis for better ensuring their quality of life.

## CONFLICT OF INTEREST

The authors have declared no competing interest.

## ORCID

*Jiang B. Gong* http://orcid.org/0000-0002-8129-0286
*Xi P. Tuo* http://orcid.org/0000-0001-9284-4718

## REFERENCES

1. National Health and Family Planning Commission. Report on the status of Chinese residents' nutrition and chronic diseases (2015) [EB/OB]. http://www.nhfpc.gov.cn/zhuz/xwfb/201506/6b4c0f873c174ace9f57f11fd4f6f8d9.shtml[2015-06-30]
2. National Health and Family Planning Commission. *2013 China Health Statistics Yearbook*. Beijing, China: Peking Union Medical College press; 2013.
3. Gu YX, Hao XJ, Chen CX, et al. Prevalence and influential factors of chronic diseases among community elderly people in Hebei province. *Chinese J Public Health*. 2015;31:132-136.
4. Pan Q. Investigation on health status of elderly people in Hubei province. *Chinese J Geriatrics*. 2016;35:672-676.
5. Li CX, Pan ZM, Zeng XY, et al. The relationship between the distribution of chronic diseases and health self-assessment of the elderly in some communities in Nanning. *Chinese J Geriatrics*. 2012;32:3748-3750.
6. Sun XC, Wang Q, Huang F, et al. A survey on prevalence of the chronic diseases among the elderly in army. *Chinese J Clini Healthcare*. 2005;8:107-109.
7. Shao H, Zhang JX, Zhao CH, et al. Study on the relationship between the quality of life and chronic diseases of the elderly in army. *Chinese J Geriatrics*. 2005;25:1460-1461.
8. Fan HM, Yan X, Rong J, et al. The analysis on chronic diseases and death of retired cadres in Chengdu area from 2006 to 2009. *Chongqing Med*. 2012;41:160-162.
9. Katz S, Ford AB, Moskowitz RW, et al. Studies of illness in the aged: the index of ADL: a standardized measure of biological and psychosocial function. *JAMA*. 1963;185:914-919.
10. Hunt SM, McKenna SP, McEwen J, et al. The Nottingham Health Profile: subjective health status and medical consultations. *Soc Sci Med A*. 1981;15:221-229.
11. Priestman TJ, Baum M. Evaluation of quality of life in patients receiving treatment for advanced breast cancer. *Lancet*. 1976;307:899-901.
12. Schipper H, Clinch J, McMurray A, et al. Measuring the quality of life of cancer patients: the Functional Living Index-Cancer: development and validation. *J Clin Oncol*. 1984;2:472-483.
13. Stewart AL, Ware JE. *Measuring Functional and Well-Being: The Medical Outcomes Study Approach*. Durham, NC: Duke University Press; 1992.
14. Li R, Wang HM, Shen Y. Development and psychometric tests of a Chinese version of the SF-36 Health Survey Scales. *Chinese J Prevent Med*. 2002;36:109-113.
15. WHO. *The Development of the WHO Quality of Life Assessment Instrument*. Geneva, Switzerland: WHO; 1993.1.
16. Wan CH, Gao L, Li XM, et al. Development of the general module for the system of quality of life instruments for patients with chronic disease: items selection and structure of the general module. *Chinese Mental Health J*. 2005;19:723-726.
17. Xie GQ, Li Y, Shi P, et al. Baseline pulmonary function and quality of life 9 Years Later in a Middle-Aged Chinese Population. *Chest*. 2005;128:2448-2457.
18. Morgan AD, Peck DF, Buchanan D, et al. Psychological factors contributing to disproportionate disability in chronic bronchitis. *J Psychosom Res*. 1983;27:259-263.
19. Scharloo M, Kaptein AA, Schlösser M, et al. Illness perceptions and quality of life in patients with chronic obstructive pulmonary disease. *J Asthma*. 2007;44:575-581.
20. Zhang QQ, Luo N, Wang CH, et al. Relationship of quality of life with clinical objective parameters in patients with diabetes mellitus the application of QLICD-MD. *J Pract Med*. 2013;29:1684-1686.

**How to cite this article:** Gong JB, Yu XW, Yi XR, Wang CH, Tuo XP. Epidemiology of chronic noncommunicable diseases and evaluation of life quality in elderly. *Aging Med*. 2018;1:64-66. https://doi.org/10.1002/agm2.12009