

## CRITICAL REVIEW OF SLEEP QUALITY AND SELF-REPORTED HEALTH STATUS OF ELDERLY WITH CHRONIC DISEASES IN SOUTHWEST CHINA

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### ABSTRACT

Population aging, shifting disease patterns, and disparities in primary healthcare access pose significant public health challenges in China, amplified by ongoing industrialization and urbanization. Sleep quality problems among the elderly, particularly those with chronic conditions, are a developing concern. This issue is especially acute in Southwest China, where significant urban-rural medical resource disparities and socioeconomic non-uniformity contribute to a notably higher prevalence of sleep disorders (46.0%) among elderly chronic disease patients compared to national and Euro-American averages. This elevated prevalence reflects not only individual physiological factors but also structural imbalances within the regional health system. The health ecological model, emphasizing the interplay of factors from individual to policy levels on health outcomes, provides an integrated theoretical framework. This review critically analyzes the causes of sleep quality and its association with self-reported health status in the elderly population within Southwest China's underdeveloped area, while also exploring implications for strengthening regional primary health care systems.

**Keywords:** Sleep Quality; Elderly; Primary Health Care; Health Ecological Model

### INTRODUCTION

Since entering an aging society in 2000, China's population aging process has been accelerating. It has shown the characteristics of fast pace, urban-rural regional disparities. Data from the national population census show that the proportion of the elderly aged 65 and above rose from 8.9% in 2010 (the Sixth Census) to 13.5% in 2020 (the Seventh Census). Meanwhile, the proportion of those aged 60 and above increased from 13.3% to 18.7% (Wang & Chen, 2022). Along with the deepening of population aging and the extension of average life expectancy, China has entered an era of longevity. However, the health of the elderly faces severe challenges: while their lifespan is prolonged, they often experience cognitive declines, motor skills decline, sensory impairment, sleep disorders, and mental health issues (Agrawal & Abimbola, 2024). According to data from the National Health Commission, by the end of 2022, the elderly population aged 65 and above in China was approximately 210 million. Nearly 80% of them suffered from at least one chronic disease, and the coexistence of multiple chronic diseases was common. The number of disabled and semi-disabled elderly was about 40 million and continues to grow. As a result, the issue of "longevity without good health" has become increasingly prominent (Akbar et al., 2020).

Driven by both population aging and urbanization, the prevalence of chronic diseases among urban and rural residents has risen rapidly, with the elderly becoming the main affected group. Age-related decline in physiological functions makes them prone to chronic diseases or deterioration due to illness. This seriously impairs their ability to live independently and overall quality of life. Problems such as inadequate primary healthcare resources and inconvenient access to medical services for residents are environmental factors that contribute to health issues in elderly patients with chronic diseases (Cerin et al., 2006). Among these, the poor quality of living environment and deteriorating sleep quality faced by the elderly have become key risk factors affecting their physical and mental health. Studies have shown that about half of Chinese adults have varying degrees of sleep disorders, and the prevalence is particularly high among the elderly. Sleep disorders themselves are not only a common health problem in the elderly but are also an important contributor to the continued rise in the high incidence of chronic diseases in the elderly (Chi et al., 2022).

To achieve the core goal of improving the quality of life for elderly patients with chronic diseases, it is urgent to adopt comprehensive and multiple service strategies. These include integrating primary health services, optimizing living environments, and promoting healthy behaviors. Such efforts aim to comprehensively advance healthy aging, maintain the basic health status of the elderly, and improve their quality of life.

## **The Fundamental of Health Ecological Model**

The Health Ecological Model (HEM) originates from Bronfenbrenner's (1979) theory of human development ecology (Bronfenbrenner, 1979). It emphasizes the dynamic interaction between individual behavior and multi-level environments. In the 1990s, scholars such as McLeroy and Stokols introduced it into the field of public health. They developed it into a systematic framework for explaining health behaviors. This model breaks the limitations of the biomedical model. It argues that health outcomes are influenced by multiple nested factors at individual, environmental, and policy levels. It is particularly suitable for the causal analysis of complex health issues such as chronic diseases (Agustí et al., 2023).

This study adopts the Health Ecological Model as its core theoretical framework. This model consists of five elements: individual characteristics, behavioral patterns, interpersonal relationships, living and working conditions, and policy environment. It provides an integrated perspective for analyzing the multiple factors that affect the health management outcomes in elderly patients with chronic diseases. According to the China Sleep Research Report (2024), the prevalence of sleep disorders among people over 60 in China has risen to 46.0%. It is significantly higher than the average level in European and American countries (32.1%) (Amidi et al., 2024; Cai et al., 2015). Due to the complexity of the geographical environment and social economic heterogeneity in the southwest China, the sleep health issues among the elderly with chronic diseases show more prominent multi-dimensional vulnerability. This phenomenon is not only related to individual pathological factors in the elderly but also reflects the structural imbalance of primary healthcare systems in the regional ecosystems. As an integrated theoretical framework, the Health Ecology Model provides a theoretical paradigm for analyzing the complex causes of sleep disorders in the elderly and constructing regional, integrated primary health services.

The underdeveloped status of the southwestern region further increases the sleep health risks for the elderly. At the societal level, the urban-rural dual structure leads to significant gradient differences in the distribution of primary medical resources. The accessibility of primary healthcare services in rural areas is only 43% of that in urban areas (Li et al., 2018). Taking Gaoping District (Nanchong City) and Cangxi County (Guangyuan City) in Sichuan Province as examples. Though they serve as provincial-level demonstration zones for comprehensive prevention and control of chronic diseases and have promoted integrated medical-nursing services, sleep health management still faces three challenges. Low access to medical care, weakened traditional family care functions, and insufficient policy support create a cumulative effect. These contradictions highlight the limitations of single-dimensional impacts on the sleep quality of elderly patients with chronic diseases. There is an urgent need to restructure the healthcare service system from a health ecology perspective.

In recent years, the application value of the Health Ecological Model in elderly health has become increasingly prominent. The WHO (2023) proposed the "Whole Ecosystem Healthy Aging" strategy, emphasizing the need for cross-level policy coordination to improve the overall nature of health services. Domestic studies also show that community health services based on the ecological model can reduce the incidence of sleep disorders in the elderly by 19-27% (WHO, 2023). However, most existing practices focus on developed eastern regions. Research on the adaptability of primary healthcare services in underdeveloped southwest China remains relatively scarce.

## **Analysis of Factors Influencing Sleep Quality in Elderly Patients with Chronic Diseases Based on the Health Ecological Model**

Sleep disorders have become a core issue affecting the health outcomes in the elderly. Good sleep is crucial for improving their quality of life and subjective well-being. Sleep disorders have become a core issue affecting health outcomes in the elderly. High quality sleep is crucial for improving their quality of life and subjective well-being. Sleep duration, an important indicator, includes both daytime naps and nighttime sleep.

Studies have found that sleep duration of rural elderly was generally longer than that of urban residents ( $p < 0.001$ ). However, there is still insufficient sleep overall. Elderly people in economically underdeveloped areas had slightly longer sleep duration than those in developed areas. A domestic research review covering the period from 2007 to 2017 notes that over 46.2% of people aged 60 and above have sleep disorders (Chung et al., 2023). The Health Ecological Model regards sleep quality as the result of dynamic interactions across individual, interpersonal, behavioral, community, and policy dimensions.

### **Individual Traits**

The individual traits level refers to the core factors that affect sleep quality in elderly patients with chronic diseases. Factors such as many chronic diseases, malnutrition, delayed improvement in medical health conditions, high psychological stress, and decline in subjective cognition among the elderly all directly impair sleep continuity.

As people age, the elderly experience a gradual decline in physical function and a weakened immune system. This makes them more prone to chronic diseases, falling into a vicious cycle

of poor health. In underdeveloped areas of southwest China, elderly people generally have low health literacy, with prominent issues of weak health awareness and insufficient healthy behaviors. Due to financial difficulties, lack of medical resources, factors such as low participation in health promotion activities, difficulties in claiming medical insurance, and costs of regular medical check-ups all hinder the adoption of healthy lifestyles. Studies have shown that elderly people with more than two chronic diseases have a 1.8 times higher risk of insomnia than those with a single disease (Chen et al., 2022). Meanwhile, the co-morbidity rate among the elderly in southwest China is as high as 76.3%, significantly increase the risk of sleep disorders due to multiple pathological burdens (Fan et al., 2023).

## **Behavioral Pattern**

Studies have found that the decline in physical activity levels among the elderly is closely related to sleep disorders. Compared with rural elderly who sleep normally, urban elderly experience sleep disorders more frequently. Poor sleep quality can reduce the basic immunity of the elderly, increase the risk of chronic diseases, and thereby worsen the condition of elderly patients with chronic diseases. Studies show that physical pain and discomfort caused by diseases in elderly patients with chronic diseases can lead to poor sleep quality. At the same time, long-term medication increases economic burden, which in turn causes psychological stress and indirectly affects sleep quality.

Therefore, the behavioral traits of the elderly are particularly important. Sleep disorders in elderly patients with chronic diseases have become a public health problem troubling the elderly. They are also one of the main causes of chronic diseases in the elderly. The behavioral patterns of the elderly population largely determine their sleep quality.

## **Interpersonal Relationship**

Among elderly patients, the quality of family support significantly affects their ability to adapt to the sleep environment. Elderly people with severe chronic diseases have high needs for nighttime care, which forces family members to intervene frequently, resulting in sleep fragmentation. More seriously, according to the data from Guizhou Provincial Bureau of Statistics in 2022, the proportion of empty-nest elderly in rural areas is as high as 62% (Jiang et al., 2023). When the elderly people living alone suffer sudden nighttime discomfort, they lack family support, making them prone to nyctophobia.

Weak social relationship networks are a common feature of elderly patients with chronic diseases in economically underdeveloped areas and can increase psychological stress. A study in Kunming communities has confirmed that the social environments at the grassroots level, in communities, and in rural areas are more likely to raise the risk of insomnia by 37% in elderly patients with chronic diseases. Elderly people with chronic diseases have declining physical functions, which further weakens their ability to engage in community mutual aid. Some elderly people living alone, seeking companionship, deliberately prolong their nighttime TV viewing. This creates a vicious cycle of relatively delayed sleep.

## **Living Environment**

The physical environments where the elderly live, including the social environment and the community environment (within a 15-minute straight-line distance), are direct physiological stressors. With accelerated urbanization and industrialization process of our society, people have gradually recognized the important role of social environments, community environments (with 15-minute straight-line accessibility), social culture, and community backgrounds in cultivating and maintaining the healthy lifestyles among the elderly.

For the elderly with multiple chronic diseases, community behaviors, social culture and community backgrounds also play an important role in cultivating and maintaining their healthy lifestyles. Giving full play to the community's publicity and organizational functions can provide primary healthcare services for elderly patients with chronic diseases living in the community. It can publicize health knowledge, improve the elderly's awareness of high-quality sleep, and enhance their health literacy. This helps create a stable and safe health service environment for elderly patients with chronic diseases. Encouraging the elderly to encourage and supervise each other, thereby developing good living habits and sleeping habits.

## **Policy Influence**

To effectively address the health and medical challenges brought by population aging, primary healthcare organizations in economically underdeveloped southwestern region of China need to actively promote sleep health promotion initiatives for the elderly. Primary healthcare institutions can conduct annual screenings using standardized tools. This helps achieve early risk identification for community-dwelling elderly patients with chronic diseases. On this basis, a "community - specialist" collaboration mechanism should be established. General practitioners from the basic health and epidemic prevention stations, working with local public health experts, will develop stratified sleep management plans for elderly patients with chronic diseases.

Factors at all levels do not exist isolated. Instead, they form a negative cycle of "sleep deprivation - worsening health" through complex feedback loops. Based on the multi-level interactive nature of the Health Ecological Model, the construction of community health service system must focus on systematizations and coordination. It should integrate multiple strategies, including individual behavior guidance, strengthened family support, environmental optimization, and policy guarantees.

## **Limitations and Prospects**

This study, based on the Health Ecological Model, has conducted a relatively systematic discussion on the influencing factors of sleep disorders in elderly patients with chronic diseases and community healthcare services. However, it still has certain limitations. In terms of research methods, it mainly relies on literature reviews, lacking large-scale empirical studies and data support. Future studies can conduct multi-center, large-sample epidemiological and public health surveys. These will further clarify the prevalence rate and influence factors of sleep disorders in elderly patients with chronic diseases in economically underdeveloped southwestern regions, providing a more accurate database for formulating targeted primary healthcare service measures.

Furthermore, this study proposes community healthcare service strategies based on the Health Ecological Model. Their feasibility and effectiveness in practical applications still need further verification. Subsequent studies should strengthen interdisciplinary cooperation, integrating knowledge from medicine, sociology, psychology and other disciplines. They should conduct in-depth exploration of the influencing factors of sleep disorders in elderly patients with chronic diseases and primary healthcare service strategies, to provide more comprehensive and scientific theoretical support and practical guidance for improving the sleep health level of the elderly.

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## REFERENCE

- Agrawal, P., & Abimbola, S. (2024). People and sites as community resources for preventing and managing chronic health conditions: A conceptual analysis. *PLOS Global Public Health*, 4(7), e0003415. <https://doi.org/10.1371/journal.pgph.0003415>
- Agustí, A., Celli, B. R., Criner, G. J., Halpin, D., Anzueto, A., Barnes, P., Bourbeau, J., Han, M. K., Martinez, F. J., Montes de Oca, M., Mortimer, K., Papi, A., Pavord, I., Roche, N., Salvi, S., Sin, D. D., Singh, D., Stockley, R., López Varela, M. V., ... Vogelmeier, C. F. (2023). Global Initiative for Chronic Obstructive Lung Disease 2023 Report: GOLD Executive Summary. *American Journal of Respiratory and Critical Care Medicine*, 207(7), 819–837. <https://doi.org/10.1164/rccm.202301-0106PP>
- Akbar, J. M., Gondodiputro, S., & Raksanagara, A. S. (2020). Elderly Satisfaction on Chronic Disease Management Program at Public Health Center, Bandung City, West Java, Indonesia. *International Journal of Integrated Health Sciences*, 8(1), Article 1. <https://doi.org/10.15850/ijjhs.v8n1.1935>
- Amidi, A., Buskbjerg, C. D. R., Christensen, D. S., Wu, L. M., & Zachariae, R. (2024). Sleep and Mental Health in the Ageing Population. In G. Kaur & S. I. S. Rattan (Eds.), *Brain and Mental Health in Ageing* (pp. 395–417). Springer Nature Switzerland. [https://doi.org/10.1007/978-3-031-68513-2\\_19](https://doi.org/10.1007/978-3-031-68513-2_19)
- Bronfenbrenner, U. (1979). *The Ecology of Human Development: Experiments by Nature and Design*. Harvard University Press.
- Cai, H., Shu, X.-O., Xiang, Y.-B., Yang, G., Li, H., Ji, B.-T., Gao, J., Gao, Y.-T., & Zheng, W. (2015). Sleep Duration and Mortality: A Prospective Study of 113,138 Middle-Aged and Elderly Chinese Men and Women. *Sleep*, 38(4), 529–536. <https://doi.org/10.5665/sleep.4564>

- Cerin, E., Saelens, B. E., Sallis, J. F., & Frank, L. D. (2006). Neighborhood Environment Walkability Scale: Validity and development of a short form. *Medicine and Science in Sports and Exercise*, 38(9), 1682–1691. <https://doi.org/10.1249/01.mss.0000227639.83607.4d>
- Chen, Y., Shi, L., Zheng, X., Yang, J., Xue, Y., Xiao, S., Xue, B., Zhang, J., Li, X., Lin, H., Ma, C., & Zhang, C. (2022). Patterns and Determinants of Multimorbidity in Older Adults: Study in Health-Ecological Perspective. *International Journal of Environmental Research and Public Health*, 19(24), 16756. <https://doi.org/10.3390/ijerph192416756>
- Chi, Y.-C., Wu, C.-L., & Liu, H.-T. (2022). Assessing Quality of Life with Community Dwelling Elderly Adults: A Mass Survey in Taiwan. *International Journal of Environmental Research and Public Health*, 19(22), Article 22. <https://doi.org/10.3390/ijerph192214621>
- Chung, M., Ho, W., Ryuno, H., Pujasari, H., Chang, P., & Chang, W. (2023). Relationship between traits and sleep quality of hospitalized elderly patients and sleep quality of family caregivers. *Nursing Open*, 10(7), 4384–4394. <https://doi.org/10.1002/nop2.1680>
- Fan, L., Liu, L., Zhao, Y., Mo, Y., Li, J., & Cai, L. (2023). Trends in the prevalence and economic burden of hypertension and its socioeconomic disparities in rural southwestern China: Two repeated cross-sectional studies. *BMJ Open*, 13(11), e076694. <https://doi.org/10.1136/bmjopen-2023-076694>
- Jiang, Y., Feng, H., Jiao, Z., Du, Y., Li, Y., Liu, X., Tong, S., Shao, X., Li, B., Sun, H., Meng, F., Shen, Y., Li, M., Zhao, Q., Li, D., Gao, L., Fu, X., Li, F., Cui, S., ... Gao, Y. (2023). Environment and chronic disease in rural areas of Heilongjiang, China (ECDRAHC). *BMJ Open*, 13(1), e063850. <https://doi.org/10.1136/bmjopen-2022-063850>
- Li, J., Shi, L., Liang, H., Ding, G., & Xu, L. (2018). Urban-rural disparities in health care utilization among Chinese adults from 1993 to 2011. *BMC Health Services Research*, 18(1), 102. <https://doi.org/10.1186/s12913-018-2905-4>
- WHO. (2023). WHO, National programmes for age-friendly cities and communities: A guide. <https://www.who.int/publications/i/item/9789240068698>