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Research status and recommendation on chronic diseases multimorbidity in the elderly in China

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Abstract. As China's population ages, the management of multimorbidity in the elderly has become a significant public health issue. Understanding the current state of research on chronic disease multimorbidity among elderly Chinese is now an urgent priority. This review addresses the growing problem of multimorbidity in elderly Chinese, focusing on prevalence, disease patterns, risk factors, and demographic characteristics. Current research highlights the significant impact of lifestyle habits and socioeconomic factors on multimorbidity. It also explores the negative effects on health-related quality of life (HRQoL), longevity, depression, and catastrophic health expenditure (CHE). This study provides valuable insights for public health governance and the development of targeted interventions for managing chronic disease multimorbidity in elderly Chinese. However, existing studies lack unified standards and definitions in disease classification and multimorbidity, and differences in study design and statistical methods may also affect the generalizability of the results. Therefore, future research should pay more attention to the important area of multimorbidity in the elderly and should focus on prevention and comprehensive management policies.

Keywords: Chronic diseases, multimorbidity, elderly.

1. Introduction

Multimorbidity is defined as "two or more" chronic diseases occurring simultaneously, with the elderly being a high-risk group in this increasingly serious public health issue [1]. China, as a populous country, is experiencing deepening aging trends [2]. The issue of multimorbidity among the elderly aggravates patients' disease burden and significantly affects their quality of life [3]. Therefore, it is necessary to summarize and clarify the current research status of multimorbidity among elderly individuals in China and propose recommendations for its development and intervention.

Several studies have focused on multimorbidity among elderly individuals in China. In terms of disease status, aspects such as disease patterns, spatial distribution, and prevalence have received considerable attention. Some articles have also explored the impacts of multimorbidity and its associated factors. According to previous research, multimorbidity is associated with lower HRQoL among elderly residents in communities [1]. There is also an association between multimorbidity and socioeconomic factors, with higher prevalence rates observed in specific populations [4]. Socioeconomic and lifestyle factors also influence disease prevalence [5].

Studying the issue of multimorbidity among elderly individuals in China can contribute to public health governance and improvements. Different populations exhibit varying degrees of vulnerability and

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disease risk concerning multimorbidity [6]. Such differences may necessitate specific intervention methods or policies. Furthermore, this research can help identify risk factors for specific disease patterns, aiding in the selection of preventive and intervention measures [7]. Disparities in disease prevalence exist between elderly populations in urban and rural areas of China [8], possibly reflecting issues from economic disparities and resource allocation.

In summary, this review focuses on the current status of multimorbidity among elderly individuals in China. It compares and summarizes disease prevalence, patterns, risk factors, and demographic characteristics. Additionally, it examines health outcomes associated with multimorbidity, such as its impact on quality of life and lifespan. Finally, the review offers recommendations for intervention methods and strategies.

2. Research status: the elderly suffer from multiple diseases

2.1. Prevalence

There is consensus across multiple articles regarding the relationship between multimorbidity prevalence and age, as well as the types of common diseases. Research generally finds that as age increases, the prevalence of multimorbidity rises [4,5,9]. As people age, their immune system weakens, increasing the risk of developing more diseases. Additionally, the prevalence of individual chronic diseases may also increase with age [4]. For example, adults aged 70-79 are six times more likely to have a disease than those aged 30-39 [4]. Regarding disease types, hypertension or arthritis are commonly believed to have higher prevalence rates among chronic diseases [3,7,10]. Moreover, rheumatism, gastric diseases, other digestive system disorders, and diabetes are also common chronic diseases [2,3,7,9], with diabetes being most likely to coexist with other chronic diseases [10]. However, there isn't a high consensus among several studies regarding the prevalence of multi-morbidity in older adults, with rates fluctuating around 50%. This variability may stem from differences in how each study classifies diseases and defines the number of conditions constituting multimorbidity. It could also result from variations in study design, inclusion criteria for diseases, and statistical analysis methods. Currently, research and disease management concerning multimorbidity is a relatively new field, and there is no widely accepted consensus on definitions and standards. As the number and scope of studies increase, it will be possible to adopt more consistent standards and methods for defining multimorbidity, classifying diseases, categorizing population groups, and reporting diseases.

2.2. Incidence pattern

Currently, there is no clear consensus on disease patterns, and there is diversity in pattern categorization. Common combinations include hypertension with lipid abnormalities, hypertension with arthritis or rheumatism, and arthritis or rheumatism with gastric or digestive system disorders. There are also patterns centered around hypertension, such as hypertension with heart disease, hypertension with cataracts, and hypertension with chronic lung disease [10]. Disease patterns are also categorized as degenerative diseases, digestive/respiratory system diseases, and cardiovascular/metabolic diseases [1]. Asthma and chronic lung disorders, asthma and arthritis or rheumatism and chronic lung diseases, and lipid abnormalities/hypertension/arthritis or rheumatism and heart disease are examples of established multimorbidity patterns [3].

2.3. Demographic characteristics and spatiotemporal distribution characteristics

Multimorbidity exhibits significant characteristics in demographic and spatiotemporal distribution. There are statistically significant gender differences in the prevalence of chronic diseases and multimorbidity. The prevalence of certain chronic diseases is higher in females, such as hypertension and diabetes [5]. However, studies yield different results regarding whether males or females have a higher prevalence of multimorbidity. Elderly individuals who are single, divorced, or widowed are more prone to multimorbidity compared to those who are married or cohabiting [6]. Moreover, elderly individuals with lower household incomes, unemployment, lower education levels, lack of health

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insurance, poor medical conditions, and a family history of chronic non-communicable diseases are more likely to have a higher prevalence of multimorbidity [4,5].

In terms of both time and location, older Chinese people are becoming more likely to be multimorbid. Urban environments have greater prevalence rates of most chronic diseases [3, 10]. However, diseases such as digestive system issues, emotional and neurological problems, arthritis, and asthma have higher incidence rates in rural areas [3]. This discrepancy may be due to the generally better economic status and lighter work demands of the urban elderly, who enjoy a more refined diet. In contrast, rural elderly individuals often continue to work in agriculture and face poorer living conditions [3]. From 1998 to 2008, the prevalence of multimorbidity was higher in the northeast and north-central regions of China compared to the southern regions. By 2018, this gap had narrowed, and the prevalence rates became more balanced [10]. Given the overall increase in multimorbidity among the elderly in China, geographical factors such as climate, culture, and diet likely influence the rates of various diseases.

2.4. Risk factors

2.4.1. Smoking

Lifestyle is a significant factor affecting disease incidence. Elderly smokers are more likely to have multiple chronic diseases, with male smokers showing higher incidence rates than female smokers [5]. Smoking adversely impacts the respiratory system, leading to conditions like chronic lung disease and asthma. Therefore, smokers are 2.07 times more likely to develop respiratory diseases compared to non-smokers [5, 7].

2.4.2. Alcohol consumption

Elderly individuals who consume alcohol have a higher incidence of multiple chronic non-communicable diseases compared to their peers [5]. Similar to smoking, male drinkers exhibit higher disease incidence rates than female drinkers [5]. This issue is particularly prevalent in rural areas, where male smoking and drinking often begin during adolescence.

2.4.3. Obesity and diet

Obesity is another important factor influencing the occurrence of multiple diseases. Elderly individuals with obesity or central obesity have higher rates of multiple chronic diseases [5]. Consistent research findings indicate that elderly individuals with lower or normal BMI have lower disease incidence rates compared to those who are overweight [6].

3. Consequences

3.1. Health-related quality of life

Using a multidimensional scale, the researchers measured the health-related quality of life [HRQoL] of elderly people living in the community at baseline, 18 months, and 24 months into the trial. A linear mixed-effects model was employed to examine the relationship between multimorbidity and HRQoL measures. The results showed that multimorbidity negatively affects the quality of life in the elderly. This was evident in lower general health, physical function, emotional well-being, self-care ability, and social adaptation [1]. Additionally, the number of chronic diseases was negatively correlated with HRQoL [1]. Understanding this relationship is crucial for developing targeted health services and elder care programs.

3.2. Life span

The examination of the Charlson Comorbidity Index revealed that the 10-year survival rate of elderly people decreased with the number of chronic diseases they had [3]. Three levels of multimorbidity severity were identified by the study: mild, moderate, and severe. The rank-sum test was used to determine these groups' survival rates. Higher multimorbidity severity was significantly correlated

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($p<0.001$) with decreased 10-year survival rates, according to the findings [3]. This demonstrates the significant detrimental effect that multimorbidity has on an older person's lifespan. Therefore, effective management of chronic multimorbidity in the elderly could be beneficial for extending lifespan. This may include regular health check-ups, early intervention, and continuous care.

3.3. Increased risk of depression

A study included 5,296 elderly participants from Eastern China, collecting self-reported histories of chronic diseases and using the Geriatric Depression Scale (GDS) to assess depressive symptoms. The results showed that elderly individuals with depression had a higher multimorbidity rate compared to those without depression ($P<0.001$) [11]. The depressed group had certain characteristics, such as living in urban areas, being older, male, engaging in less physical activity, and having lower social health scores [11]. In the urban-rural comparison, rural elderly individuals were less likely to exhibit depressive symptoms [11]. This indicates that, in addition to basic healthcare resources, the psychological state of the elderly is a significant factor in multimorbidity and needs attention.

3.4. Increase in CHE

Multimorbidity poses a significant risk for CHE, potentially placing a substantial financial burden on families. Overall, multimorbidity is significantly associated with an increased likelihood of CHE [13]. CHE refers to expenses that exceed a household's ability to maintain a normal standard of living, threatening their capacity to purchase other goods and services. Among 3,511 elderly individuals over 60 with multimorbidity, 31.5% to 45.6% of households experienced CHE [12]. The study also found that the incidence of CHE increases with the number of reported chronic diseases [12]. In terms of demographics, elderly individuals who are male, older, have completed primary or secondary education, and live in households with two or fewer members are more likely to experience CHE [12].

4. Suggestions

Preventing, treating, and managing multimorbidity among elderly Chinese is essential. Regular health check-ups help detect health risks early and enable preventive measures. Considering the convenience for elderly individuals, community healthcare centers can offer health check-up services, reducing transportation risks and medical burdens. The summarized research indicates that lifestyle habits significantly impact multimorbidity. Community health service centers can provide health education activities, offering lifestyle recommendations and encouraging family involvement in monitoring these habits. In terms of mental health, elderly individuals, whether living alone or with family, can benefit from appropriate social connections. Daily interactions, such as chatting and walking with other elderly individuals, provide psychological support and promote physical activity. With the deepening of aging, multimorbidity is becoming a common health issue among the elderly in China. To address this, the healthcare system should not only provide vaccination services but also consider offering preventive care services in the community.

5. Conclusion

This review summarizes the current research on multimorbidity among elderly Chinese, focusing on prevalence, disease patterns, risk factors, and demographic characteristics. It emphasizes the significant impact of lifestyle habits and socioeconomic factors on multimorbidity. Additionally, the review explores the negative effects of multimorbidity on HRQoL, longevity, depression, and CHE, highlighting the importance of comprehensive management and preventive measures. Differences in morbidity rates between urban and rural elderly populations partly reflect economic and resource allocation issues. The findings underscore the importance of regular health check-ups and community health services to detect and mitigate health risks early. Community health centers play a crucial role in providing health education and promoting healthier lifestyles.

Furthermore, regardless of whether the elderly live alone or with family, attention to their mental health is vital for improving overall health outcomes. The insights from this review are significant for

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public health governance. Understanding the vulnerability and disease risk in different populations can inform specific intervention methods or policies. Identifying risk factors for specific disease patterns can guide the selection of preventive and intervention measures. However, this review also has limitations. It primarily relies on existing literature, which may have inconsistencies in disease classification and the definition of multimorbidity. Differences in research design, inclusion criteria, and statistical methods can lead to varied results, affecting the generalizability of the findings.

Additionally, the review does not extensively explore genetic factors that might contribute to multimorbidity. Future research should aim to establish more consistent standards in defining and classifying diseases related to multimorbidity. To gain a deeper comprehension of the causal connections and underlying mechanisms of multimorbidity, longitudinal research including bigger sample sizes and various populations are necessary. Exploring the genetic and environmental influences on multimorbidity will also provide deeper insights. Ultimately, developing targeted interventions and policies based on comprehensive and consistent research will be crucial in managing and preventing multimorbidity among elderly Chinese.

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