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REVIEW

Research progress on community health management model for older adults with chronic diseases and multiple morbidities

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Abstract

With the rapid ageing of the population, the number of older adults with two or more chronic diseases is increasing. There are individual differences in health assessment, diagnosis, treatment, health management, and medication safety for older adults with chronic conditions and multiple morbidities. Managing these conditions poses increasingly complex challenges for the healthcare system. Developing effective community health management models specifically designed for older adults with multiple chronic diseases is crucial for improving their overall health. This study provides a comprehensive review of the progress in research on community health management models for older adults with multiple chronic diseases, aiming to offer valuable insights for health management in this population.

Key words: Chronic diseases; Community; Health management; Multiple morbidities; Older adults; Research progress

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Introduction

Chronic diseases are characterised by subtle onset, long incubation periods, prolonged and slow progression, and delayed healing (Boteanu et al, 2017). Various chronic diseases, including hypertension, diabetes, chronic obstructive pulmonary disease, and chronic respiratory diseases, are significant factors that threaten human health and shorten life expectancy (Strong et al, 2005). It is projected that chronic diseases will cause 70% of global deaths by 2030 (Dong et al, 2020). As people age, physiological functions like vision and hearing decline to varying degrees. The elderly population becomes a high-risk group for chronic diseases, which have long durations, complex etiologies, and are difficult to treat, imposing a heavy burden on individuals, families, and society (Abegunde et al, 2007; Lagoumtzi and Chondrogianni, 2021). By 2030, the number of people aged 60 and above is expected to peak at 1.4 billion, and by 2050, this number is projected to rise to 2.1 billion (Olshansky and Carnes, 2010). The rapidly ageing population is accompanied by an increasing number of patients with two or more chronic diseases, posing increasingly challenging tasks for the healthcare system (Samal et al, 2021).

The World Health Organization (WHO) defines comorbidity as the coexistence of two or more chronic diseases in a patient, lasting for at least 6 months (De Maria et al, 2021). Comorbid patients are more likely to have frequent visits, experience negative emotions, and face increased risks of adverse outcomes, disabilities, and even death. They are a population of special concern in nursing. However, most current chronic disease management plans focus only on controlling one chronic disease, leaving other chronic conditions inadequately addressed. Effective management aims to oversee medical behaviours and processes, including early screening of chronic diseases, prediction of chronic disease risks, early warning, comprehensive intervention, and evaluation of the effectiveness of chronic disease management (Yang et al, 2023). Previous researches have shown that early prevention, screening, diagnosis, and care measures can be beneficial to the prognosis of chronic disease diagnosis and treatment (Ha and Park, 2020; Vasan et al, 2020; Samal et al, 2021). However, due to the hidden onset and long course of chronic diseases, chronic disease care remains a bottleneck and a focus of attention in the academic field.

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In 1998, Wagner (1998) proposed a chronic disease management model based on joint interventions involving patients, providers, and healthcare policy to focus on healthcare systems, community resources, policy support, the design of healthcare delivery systems, data management of clinical information systems, and patient self-management. Currently, nursing research on chronic disease comorbidity primarily includes assessment, pattern recognition, and health management of comorbidity.

In 2002, the WHO (World Health Organization et al, 2002) introduced the Innovative Care for Chronic Conditions framework, which operates on three levels: micro-level (patients and their families), meso-level (health management and community), and macro-level (policy and mobilization of financial resources). In 2011, the 'Improving Chronic Care' programme was launched. This program focused on: (1) Increasing patient safety content in the healthcare system; (2) Considering patients' educational levels and ideologies in the design of healthcare delivery systems; (3) Increasing case management in the design of healthcare delivery systems; (4) Strengthening nursing coordination; (5) Supplementing community-related policies (Piette et al, 2011).

The integration of healthcare delivery systems enables chronic disease patients to receive timely diagnosis and treatment under any circumstances. However, in remote and isolated communities, hospital nursing is often slow, leading to a significant increase in hospitalization rates for outpatient care. There are individual differences in health assessment, diagnosis, health management, and medication safety for patients with chronic disease comorbidities, making clinical work more challenging than for those with a single disease. Exploring and developing effective community-based health management models for older adults with chronic disease comorbidities is crucial for improving their quality of life and overall health. In recent years, community health management has become an essential component of community health services. Scholars have gathered substantial research data on various issues, including how to integrate health management of chronic senile diseases with community management, the service content that community health management should provide, the personnel composition and task allocation for managing chronic senile diseases in the community, and the operational strategies for managers.

This study provides a review of the research progress in health management models for older adults with chronic disease comorbidities in the community, aiming to offer valuable references for managing this population.

In the field of chronic disease and comorbidity health management models, different countries and regions implement various models based on their development and social characteristics. However, there are also some commonalities. Community health management models can be mainly categorized into the following four types.

Community intervention self-management model

In the management of chronic diseases and comorbidities, it is imperative to consider the perspectives of both healthcare professionals and patients themselves. Patient awareness of these conditions and improvement in treatment adherence are pivotal for effectively controlling chronic diseases and comorbidities. However, due to the constraints of time during patient visits, there may be limited opportunity for in-depth and comprehensive communication between doctors and patients. This limitation makes it challenging for doctors to fully grasp the patients' disease and lifestyle situations within the confines of a brief consultation.

Therefore, it becomes essential for patients and their families to educate themselves about chronic diseases and their management, thereby enhancing their motivation for prevention and control. This proactive approach empowers patients to effectively manage their conditions. It is estimated that over 99% of daily care for chronic diseases is carried out by individuals and family caregivers (Riegel et al, 2017). Self-management entails self-care activities occurring within recognised health parameters, with a certain degree of involvement from healthcare providers (Matarese et al, 2018).

According to the theory of self-care for chronic diseases (Riegel et al, 2012), self-care encompasses three key aspects: adherence to treatment and health promotion practices, monitoring of behaviours and conditions, and managing arising signs and symptoms.

Primary healthcare workers serve as the initial guides for community patients with chronic diseases, and they must emphasise the importance of health education, enhance patient adherence, and assist patients in modifying unhealthy habits.

Yang et al (2021) evaluated the effectiveness of nurse-led medication self-management interventions in enhancing medication adherence and health outcomes among community-dwelling elderly patients with multiple chronic conditions, and found that nurse-led medication self-management interventions significantly improved patients' adherence and health status.

In a prospective cohort study conducted across five European countries over a 6-month period, community-based health education interventions were found to significantly enhance self-efficacy, health behaviours, health-related quality of life, and sense of health responsibility among elderly patients with chronic diseases and comorbidities.

In a subsequent long-term follow-up study involving 951 patients with chronic diseases, several key health indicators displayed significant improvement trends:

1. Enhanced self-efficacy: Patients demonstrated improved self-management skills, as evidenced by a notable increase in the Self-Efficacy for Managing Chronic Diseases 6-item scale (SEMCD-6), rising from 6.4 at baseline to 6.7 at follow-up.
2. Reduction in depressive symptoms: Evaluated using the Patient Health Questionnaire (PHQ) depression scale, there was a marked decrease in depressive symptoms among patients, with scores declining from 7.0 to 6.3.
3. Improved quality of life regarding physical and mental health: Significant enhancements were observed in both physical health (physical score increased from 40.2 to 42.3) and mental health (mental score increased from 41.4 to 42.8) aspects of patients' quality of life.
4. Enhanced health effectiveness: Patients' health effectiveness, as measured by the EuroQol-5 Dimensions-5 levels (EQ-5D-5L) index, rose from 0.86 to 0.88, indicating a positive change in overall health.
5. Improved self-evaluation of overall health: Patients reported a significant improvement in their subjective perceived health status, with the EQ-5D-5L score increasing from 63.9 points to at least 67.2 points.

These findings underscore the efficacy of interventions aimed at promoting self-management and improving the wellbeing of patients with chronic diseases.

All of these observed improvements were statistically significant, with their corresponding *p*-values being less than 0.002, thus providing robust evidence supporting the treatment and management of patients with chronic diseases (Korenhof et al, 2023).

Furthermore, a multicenter, single-blind randomised controlled trial conducted in Europe, focusing on community interventions for elderly patients with type 2 diabetes and other chronic conditions, demonstrated enhancements in quality of life, self-management capabilities, and a reduction in depressive symptoms, all achieved without a concomitant increase in overall healthcare costs (Markle-Reid et al, 2018).

HealthRise model

To bolster community-based interventions for non-communicable diseases, HealthRise was launched in 2014. This localised programme was designed to implement and pilot hypertension and diabetes screening, diagnosis, management, and control initiatives in underserved communities. The primary objective of HealthRise is to enhance access to care for these prevalent chronic diseases through a tailored approach. By testing and adapting interventions within local settings, HealthRise aims to address health challenges more effectively, ensuring interventions are aligned with the needs and cultural contexts of specific communities.

By doing so, health enhancement programs contribute to improving the quality of healthcare for underserved populations, diminishing health disparities, and fostering the overall wellbeing of the community. Between 2016 and 2018, pilot programs were executed in nine communities to evaluate the efficacy of the HealthRise model in screening, diagnosing, managing, and controlling common chronic diseases like hypertension and diabetes within the community, in comparison to conventional care (Flor et al, 2020; Fullman et al, 2023).

The HealthRise study presented pivotal cross-national survey findings aimed at offering insights into community-based non-communicable disease management strategies for underserved populations worldwide. Research outcomes indicate that in both Brazil and the United States, the HealthRise model holds the promising potential to significantly enhance patient health outcomes, including improved quality of life, decreased complications, and heightened disease control rates (Flor et al, 2020).

Subsequent studies conducted in 2023 by Fullman et al (2023) further underscored the positive impact of participation in the HealthRise community-based healthcare programme in narrowing healthcare disparities and improving outcomes for hypertension and diabetes. Through a difference-difference analysis of patient data spanning from June 2016 to October 2018, HealthRise demonstrated remarkable success in enhancing the health of individuals with hypertension and diabetes in underserved communities, transcending the scope of traditional healthcare services.

Key findings included:

1. Enhanced blood pressure management: The programme notably reduced systolic blood pressure (SBP) levels among participants, enabling a greater number of patients to achieve the clinical control goal for hypertension, defined as an SBP of less than 140 mmHg.
2. Improved blood sugar control: The HealthRise programme facilitated the effective management of blood sugar levels among patients with diabetes, with a significant proportion of patients achieving glycated hemoglobin A1c (HbA1c) levels below the recommended threshold of 8%, indicating substantial improvements in blood sugar control.
3. Increased attainment of clinical goals: Comparative analysis between the intervention and control groups revealed that patients participating in the HealthRise programme achieved clinical goals for blood pressure and blood glucose at a higher rate compared to those receiving standard care.

The analysis reveals efficacy beyond usual care, providing further evidence of the effectiveness of localised and targeted interventions through HealthRise in enhancing patient health outcomes beyond the scope achievable by relying solely on traditional medical services. These findings not only underscore HealthRise's potential to elevate the quality of chronic disease management but also offer empirical support for scaling up similar programs globally in the future.

Moreover, Kaza et al (2022) discovered that amidst the coronavirus disease 2019 (COVID-19) pandemic, the adoption of the HealthRise management model, particularly the Support, Appreciate, Learn, and Transfer-Community Life Competence Process (SALT-CLCP) intervention, led to significant strides in maintaining healthy behaviours and enhancing self-care practices among patients with comorbidities.

Ageing, community, and health research unit-community partnership program model

To address the health management needs of older adults with diabetes and multiple comorbidities, Canada implemented the person-centred Ageing, Community, and Health Research Unit (ACHRU)-Community Partnership Program (CPP). This initiative focuses on assessing the feasibility of the ACHRU-CPP model, emphasising enhanced communication and collaboration within community teams. Monthly case conferences are conducted, involving nurses, researchers, project coordinators, and patients, to develop patient-centred, case-based care plans for each participant. Registered nurses play a crucial role in care coordination, facilitating access to services and support across the care continuum, and fostering communication among participants, care providers, project teams, and primary care (Markle-Reid et al, 2017; Ploeg et al, 2022).

Preliminary evidence of the program's potential effectiveness has been garnered based on changes in self-management behaviours, health status, and the utilization of health and social services over a period of 6 months or more. This preliminary evidence has identified the most suitable primary outcome measures for larger randomised controlled trials. The ACHRU-CPP model has demonstrated improvements in older adults' knowledge of managing

diabetes and other chronic conditions, enhanced physical activity and functioning, improved dietary habits, and increased social opportunities (Yous et al, 2023).

Community pharmacy management model

Elderly patients with multiple chronic comorbidities often face polypharmacy, rendering them particularly vulnerable to medication-related issues which are linked with heightened morbidity, adverse drug events (ADEs), prolonged hospital stays, and increased mortality rates (Alfahmi et al, 2023; Murry et al, 2023). Within hospital settings, pharmacists play a pivotal role in providing medication care in both outpatient clinics and inpatient departments. In primary care, pharmacist interventions encompass medication reviews with feedback to physicians and medication education for patients. Within long-term care facilities, pharmacists collaborate with other healthcare professionals in case conferences and offer education to staff while providing medication management services. In the community pharmacy setting, health management interventions are spearheaded by pharmacists, supported by a multidisciplinary team, and revolve around planning, delivering, and coordinating care tailored to individual needs.

Initially, a healthcare professional conducts an interview with the patient to gather comprehensive data on medication treatments, encompassing medication usage, knowledge, and experiences. Additionally, information on non-pharmacological treatments, lifestyle, living conditions, allergies, functional status, hospitalizations, and fall events is collected. Subsequently, the pharmacist undertakes medication therapy analysis to identify medication-related issues, with a specific focus on medication aspects such as dosing frequency, timing, and precautions. Interventions are discussed and implemented with the patient, followed by a review of medication summaries to ensure the patient's understanding of all aspects. In subsequent follow-ups, the pharmacist evaluates the effectiveness of interventions and monitors for the occurrence of new issues or the need for further interventions.

Multiple studies have demonstrated the positive impact of community pharmacy-based health management on the outcomes of elderly patients with polypharmacy (Khera et al, 2019; Alfahmi et al, 2023; Murry et al, 2023). For instance, a survey conducted in Belgium involving 75 pharmacies, with 12 patients recruited per pharmacy, totalling 900 individuals, revealed that intermediate and advanced medication assessments conducted by community pharmacists significantly improved adherence and subsequently enhanced the health status of elderly patients (Wuyts et al, 2018).

Family doctor model

The family doctor model of care revolves around general practitioners and is bolstered by a team of healthcare professionals. This model, established through contractual agreements, fosters long-term, stable relationships between general practitioners and enrolled families. It offers basic medical services, public health services, and personalized health management services to enrolled family members, ensuring comprehensive care. As a chronic disease management model centred on family doctor teams, community-based family doctor contracting services have emerged as an effective approach to bridge gaps in primary healthcare services.

The treatment and management of elderly patients with multiple chronic comorbidities necessitate long-term, intricate, and multifaceted interventions. Traditional healthcare models often fall short in meeting their needs. Therefore, the introduction of family doctor contracting services aims to forge closer connections between patients and doctors, thereby enhancing treatment adherence and self-management capabilities, ultimately leading to improved outcomes and prognosis. Elderly patients with chronic comorbidities benefit from family doctor contracting services alongside routine management.

The community family doctor service, comprising community nurses, general practitioners, and public health doctors, should establish teams tailored to the specific needs of patients. General practitioners are responsible for gathering medical histories, conducting physical examinations, devising personalized health management plans, and providing exercise guidance. Family nurses create patient profiles, educate patients about

the content of family doctor contracting, perform constitutional assessments, offer lifestyle guidance, and evaluate the functional abilities of the elderly. Public health doctors are tasked with delivering health education.

Numerous studies have highlighted the positive impact of family doctors on the healthcare of elderly patients with chronic comorbidities, notably increasing treatment adherence and reducing patient depression (Liu et al, 2021; Zheng et al, 2021; Du et al, 2023; Liu et al, 2023; Lv et al, 2023; Yu et al, 2023). Following eligibility screening of 10,970 patients, 968 patients were categorized into two groups based on the type of service package received: the observation group (receiving 'basic package + personalized hypertension package' service, n = 403) and the control group (receiving only the 'basic package' service, n = 565). The study revealed that the observation group demonstrated significant advantages in several key health measures compared to the control group 6 months after joining the programme. The mean systolic blood pressure (SBP) in the observation group was significantly lower than that in the control group ($p = 0.023$), indicating superior blood pressure control in the observation group with the aid of personalized hypertension packages. Moreover, regarding blood pressure control rates, the observation group surpassed the control group, with the difference being highly statistically significant ($p < 0.001$), suggesting a higher proportion of patients in the observation group achieved effective blood pressure management. Additionally, patients in the observation group exhibited significantly lower levels of cardiovascular disease risk compared to those in the control group ($p < 0.001$), indicating that personalized hypertension packages not only enhanced blood pressure control but may also mitigate the risk of cardiovascular events. Furthermore, the level of self-management ability among patients in the observation group was significantly higher than that in the control group ($p < 0.001$), underscoring the positive impact of personalized services in enhancing patients' awareness and capacity for disease management (Du et al, 2023).

In conclusion, the family doctor service model emerges as an effective approach for managing elderly patients with chronic comorbidities and warrants promotion.

Discussion

Based on the research advancements in community-based health management models for elderly patients with chronic comorbidities, it is apparent that community-based approaches are effective in delivering health management for elderly individuals. This strategy holds substantial promise for chronic disease prevention and control, as it plays a pivotal role in enhancing patients' quality of life. However, there are also notable limitations in current research endeavors. Most studies and trials have relatively short durations, typically spanning from 6 months to 1 year, and there is a dearth of long-term follow-up and large-scale randomised controlled studies. Consequently, there remains a pressing need for further exploration and evaluation of implementation strategies, as well as effectiveness assessment for community health management initiatives.

In future research endeavors, a comprehensive meta-analysis study is recommended to fully assess the effects of chronic disease self-management interventions and their influencing factors. This study should delve into factors such as the duration, content, and context of the intervention, exploring their potential impact on intervention effectiveness. Moreover, for studies focusing on behaviour and lifestyle changes, extending the follow-up period is advised to better evaluate the persistence and stability of the intervention effect. Objective measures such as blood pressure, blood sugar, and body mass index should be utilized in this process to provide a more accurate assessment.

Furthermore, to address health disparities, special attention and inclusion should be directed towards marginalized groups in society who are vulnerable to neglect. Ensuring that they receive appropriate care and support in chronic disease management plans is imperative. It is essential to strengthen practical exploration of community health management models. This entails the development of scientific, standardized, and practical community health management programs, leveraging modern information technology tools, establishing chronic disease management systems, and enhancing health monitoring systems. These efforts will yield more evidence for the development of scientific and effective strategies for chronic disease prevention and control.

Conclusion

With the rapid ageing of the population, the prevalence of older adults living with two or more chronic diseases is on the rise. Given the individual differences in health assessment, diagnosis, treatment, health management, and medication safety among this demographic, there is a critical need for effective health management models tailored to their specific needs. This study offers a comprehensive review of research progress in various health management models for older adults with chronic disease comorbidities in the community. These models include the Community Intervention Self-Management Model, HealthRise Model, ACHRU-CPP Model, Community Pharmacy Management Model, and Family Doctor Model, aiming to provide valuable insights and reference points for effectively managing this population, thereby improving their overall health outcomes and quality of life.

Key points

- This study offers a comprehensive review of research progress in health management models tailored to older adults with chronic disease comorbidities in the community.
- We found that community health management models can be mainly categorized into four types.
- We are given older adults with chronic disease comorbidities a reference to choose effective health management models tailored to their specific needs.
- We are providing valuable insights and reference points for effectively managing this population and enhancing their overall wellbeing.

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Availability of data and materials

All the data of this study are included in this article.

Author contributions

MYZ, MZ and XQW contributed to the conception or design of the work. MYZ analyzed the data, drafted and revised the manuscript. All authors contributed to important editorial changes of important content in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

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Conflict of interest

The authors declare no conflict of interest.

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