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Research on Enhancing the Efficacy of Home-Based Diabetes Care and Health Management from the Perspective of Chronic Disease Management

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Abstract: Chronic disease management constitutes the core direction for diabetes prevention and control, with home-based nursing and health management serving as a critical component in enhancing patients' self-management capabilities. This paper examines chronic disease management as a framework to analyze the essential principles and efficacy of home-based diabetes nursing and health management. It identifies current challenges in the management system, such as incomplete structures, imprecise services, and weak patient self-management skills. The study explores pathways to improve efficacy from the perspectives of system development, model innovation, and capacity building, providing theoretical references and practical solutions for establishing a scientific home-based diabetes nursing and health management system and enhancing the effectiveness of chronic disease prevention and control.

Keywords: Chronic disease management; Diabetes mellitus; Home care; Health management efficacy

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1. Introduction

Diabetes mellitus, as a typical chronic metabolic disorder, is characterized by a prolonged disease course and a high propensity for complications, necessitating long-term and continuous health management. Home care serves as a critical link in the chronic disease management system, bridging hospital-based diagnosis and treatment with patients' daily care. Currently, home-based diabetes care and health management in China still face challenges, such as low standardization, insufficient collaboration between medical and elderly care services, and a mismatch between service provision and patient needs, resulting in suboptimal management efficacy and an inability to meet the practical demands of chronic disease prevention and control. This paper, from the perspective of chronic disease management, focuses on enhancing the efficacy of home-based diabetes care and health management, explores its core principles and implementation pathways, and aims to promote the standardized and scientific development of home-based care and health management, thereby contributing to the improvement of the diabetes chronic disease prevention and control system [1].

2. The core connotation of home-based diabetes care and health management from the perspective of chronic disease management

2.1. The connotation of chronic disease prevention and control adaptation in home-based diabetes care and health management

The core requirement of chronic disease management is to achieve long-term dynamic disease prevention and control while reducing the incidence of complications. Home-based diabetes care and health management are highly aligned with this requirement, serving as a critical vehicle for extending chronic disease prevention and control from hospitals to households. This alignment is reflected in its focus on patients' daily home scenarios, addressing core needs such as blood glucose monitoring, medication guidance, and dietary regulation through continuous and routine health management. This approach compensates for the limitations of hospital-based, episodic treatments, ensuring comprehensive diabetes prevention and control that aligns with the fundamental principle of chronic disease management, "long-term management and sustained intervention." Furthermore, home-based care and health management must closely adhere to the characteristics of diabetes as a chronic condition, particularly its susceptibility to lifestyle influences and diverse complications. The focus of prevention and control should extend beyond mere disease monitoring to include lifestyle interventions and early complication screening. Through personalized home care plans, patients can establish healthy lifestyle habits, thereby reducing the risk of disease progression and complication occurrence at the source. Consequently, home-based care becomes an integral component of the diabetes chronic disease prevention and control system, achieving precise integration with hospital-based treatments [2].

2.2. Core connotation of comprehensive home-based diabetes care and health management services

The comprehensive service framework for home-based diabetes care and health management encompasses the entire process, ranging from post-discharge guidance to daily home care, disease status monitoring, and follow-up appointment scheduling. It constitutes a systematic and continuous health service system. Its core principle lies in breaking down the service barriers between hospitals and households by providing professional home care guidance during the initial post-discharge period, conducting real-time health monitoring and counseling during routine care, promptly coordinating with hospitals for interventions when disease conditions change, and ensuring seamless follow-up reminders and clinical transition. The holistic nature of this service is further demonstrated by its comprehensive scope, which includes not only fundamental medical care services such as blood glucose monitoring and medication guidance but also comprehensive health services encompassing dietary planning, exercise instruction, and psychological counseling, addressing both physiological and psychological needs of patients. To meet the diverse care requirements of diabetic patients at home, this approach integrates professional resources from multiple disciplines, including medicine, nursing, nutrition, and psychology, to deliver one-stop home health management services, enabling patients to receive comprehensive and professional care support within their home environment. This exemplifies the core essence of the full-process service model.

2.3. The connotation of collaborative medical and elderly care practices in home-based diabetes care and health management

The integration of medical and elderly care constitutes the core practical essence of home-based diabetes care and health management. It involves combining medical treatment resources with elderly care resources to achieve collaborative efforts among hospitals, communities, and families, thereby providing patients with professional and personalized home care services. Hospitals leverage their expertise in diagnosis and treatment to develop tailored home care plans, deliver technical guidance, and manage complications; community health service institutions provide daily home care services, health monitoring, and information feedback; families, as the primary caregivers, implement routine care measures. This tripartite approach forms a clearly defined and coordinated practical system. This model also requires establishing

an efficient information-sharing and coordination mechanism to enable real-time transmission and exchange of patient health data among hospitals, communities, and families. This allows hospitals to promptly monitor patients' home care status and adjust treatment and care plans based on disease progression, communities to accurately implement hospital recommendations, and families to receive professional real-time guidance, thereby breaking down information barriers. Through this integrated model, professional medical and nursing services are extended to households, ensuring that home care combines medical professionalism with the humanized approach of elderly care, thereby enhancing its practical effectiveness.

3. Existing issues in home-based diabetes care and health management from the perspective of chronic disease management

3.1. The standardized service system for home nursing health management remains underdeveloped

Currently, China's home-based diabetes care and health management lacks a nationally unified standardized service system. Significant disparities exist in service content, operational protocols, and evaluation criteria across regions and healthcare institutions, resulting in inconsistent service quality. In some areas, home care is limited to basic blood glucose monitoring and medication reminders, lacking standardized guidance on diet, exercise, and psychological counseling. Additionally, the qualifications and operational procedures for home care providers lack uniform standards, with non-professional caregivers often lacking adequate nursing knowledge to deliver professional home care services. The absence of a standardized service system is further reflected in inadequate management processes and evaluation mechanisms. Key aspects such as home care workflows, data recording, and condition feedback lack standardized requirements, compromising service traceability. Moreover, a scientific evaluation system for home care health management effectiveness has not yet been established. Current evaluation metrics predominantly focus on blood glucose control while neglecting core indicators such as patient self-management capabilities and quality of life, hindering comprehensive and objective assessment of management outcomes and providing insufficient evidence for service optimization, thereby constraining the standardized development of home-based diabetes care and health management [3].

3.2. There is a gap in the provision of precision-based home nursing and health management services

There is a significant mismatch between the provision of home-based diabetes care and health management services and patients' personalized needs, with a pronounced lack of precision-oriented service delivery. Patients exhibit substantial variations in age, disease duration, complication status, and lifestyle habits, resulting in diverse home care requirements. For instance, elderly patients primarily require basic nursing care and safety guidance, while younger patients prioritize personalized dietary and exercise plans. However, current home care predominantly adopts a "one-size-fits-all" service model, lacking tailored service protocols for different patient populations, thereby failing to meet precise patient needs. The absence of precision-oriented services is further reflected in uneven resource allocation and limited service formats: high-quality home care services are predominantly concentrated in urban core areas, while rural and remote regions suffer from inadequate service resources, making it difficult for patients to access professional home care support. Additionally, home care services primarily rely on offline in-person visits and telephone consultations, lacking diversified service formats such as real-time monitoring and online guidance enabled by digital technologies, resulting in insufficient timeliness and convenience. Furthermore, the connection between service delivery and patients' disease progression is inadequate, preventing timely adjustments to service plans based on dynamic disease changes, which significantly compromises service precision and effectiveness.

3.3. The self-management capacity for home healthcare among diabetic patients urgently needs improvement

The self-management capacity of diabetic patients at home is pivotal to enhancing management efficacy. However, the

self-management skills of most patients currently require significant improvement. Some patients lack fundamental knowledge of diabetes care, demonstrate insufficient understanding of blood glucose monitoring frequency, medication adherence protocols, and dietary and exercise management principles, and even exhibit behaviors such as indiscriminate discontinuation of medications or irrational dietary habits, leading to suboptimal glycemic control and disease recurrence. Additionally, certain patients exhibit misconceptions about the disease, neglecting early screening and prevention of complications, thereby increasing the risk of complications. The weak self-management capabilities of patients are also closely linked to the absence of systematic health guidance and sustained behavioral interventions. Discharge instructions from hospitals are often one-time and fragmented, lacking follow-up monitoring and guidance. Furthermore, the training systems for improving patient self-management remain inadequate, with content predominantly theoretical and lacking practical guidance, making it difficult for patients to apply acquired knowledge to daily home care. Moreover, some patients exhibit negative psychological states, lack confidence in disease management, and suffer from insufficient family support and supervision, resulting in inadequate motivation and self-discipline for long-term adherence to evidence-based home care measures.

4. Implementation principles of home-based diabetes care and health management from the perspective of chronic disease management

4.1. Principles for integrating chronic disease prevention and control with personalized nursing care

Home-based diabetes care and health management must adhere to the core principle of chronic disease prevention and control, consistently focusing on the primary objectives of "long-term disease management, complication reduction, and quality of life improvement." The core components of home care include maintaining long-term stable blood glucose levels, early screening and prevention of complications, and fostering healthy lifestyle practices. All nursing interventions must serve the overarching goals of chronic disease management, ensuring that home care aligns closely with the essential requirements of diabetes management and avoiding superficial implementation. While maintaining a chronic disease prevention orientation, nursing services must be tailored to patients' individual needs, achieving an organic integration of prevention-focused approaches with personalized care. Tailored home care plans should be developed based on individual factors such as age, disease duration, complication status, lifestyle habits, and cultural background. For example, patients with comorbid hypertension should receive dual control of blood glucose and blood pressure; elderly patients living alone should receive enhanced basic care and safety guidance; and younger patients should receive customized dietary and exercise plans. This approach ensures that home care not only meets the unified standards of chronic disease management but also addresses patients' specific needs, thereby improving the precision and effectiveness of care.

4.2. The principle of synergy: Integration of medical-care coordination and home-based self-management

The integrated collaboration between medical and elderly care services is a fundamental principle for home-based diabetes care and health management. It is essential to strengthen the coordinated efforts among hospitals, communities, and families, clarify the respective responsibilities and divisions of labor, establish an efficient information-sharing and coordination mechanism, and achieve seamless integration of specialized medical resources with elderly care resources. This ensures that patients receive professional and convenient medical and nursing services in their home environment, compensating for the limitations of family-based self-care and providing professional support for home-based health management. The integrated collaboration must be combined with self-management at home, fully leveraging the proactive role of patients and their families to achieve synergistic development between professional care and self-management. The core of home-based care lies in enhancing patients' self-management capabilities, enabling them to independently perform daily tasks such as blood glucose monitoring, medication adherence, and dietary regulation. The ultimate goal of this integrated approach is to empower patients and their families to improve their self-management skills. Therefore,

alongside providing specialized integrated medical and elderly care services, emphasis should be placed on training and guiding patients and their families to actively participate in home-based care management, fostering a positive framework characterized by "professional guidance, independent implementation, and collaborative supervision."

4.3. The principle of continuity: Equal emphasis on whole-process dynamic monitoring and long-term intervention services

Comprehensive dynamic monitoring serves as the fundamental principle for home-based diabetes care and health management. As a chronic disease, diabetes exhibits dynamic changes influenced by multiple factors. It is essential to conduct continuous monitoring of core patient indicators such as blood glucose, blood pressure, and body weight, as well as lifestyle factors including medication adherence, dietary habits, and physical activity. Real-time and continuous monitoring data enable timely assessment of disease progression and nursing implementation, providing precise data support for adjusting care plans and achieving dynamic disease control. Building upon comprehensive dynamic monitoring, the principle of sustained intervention services must be upheld to integrate monitoring with targeted interventions, ensuring the continuity of home-based diabetes care and health management. For issues identified during monitoring, prompt and tailored interventions should be implemented, such as adjusting medication and dietary regimens when blood glucose levels are elevated, or providing guidance and supervision when patient self-management is inadequate. Additionally, a long-term intervention service mechanism should be established, offering sustained care support through regular home visits, real-time online consultations, and periodic health follow-ups. This approach prevents interventions from being one-off or fragmented, ensuring the long-term and continuous effectiveness of home-based diabetes care and health management.

5. Strategies for enhancing the efficacy of home-based diabetes care and health management from the perspective of chronic disease management

5.1. Establish a standardized home-based diabetes care and health management service system

A nationally unified standardized service system for home-based diabetes care and health management should be established by clearly defining core elements such as service content, operational protocols, qualification requirements, and evaluation criteria. Standardized service coverage should include blood glucose monitoring, medication guidance, dietary planning, exercise instruction, psychological counseling, and complication screening, while standardized operational procedures should be developed for each service component. Concurrently, a unified qualification assessment and training system for home care providers should be established to specify professional competency requirements and implement systematic professional training, thereby enhancing service capabilities and ensuring professionalism and standardization in home-based diabetes care services.

Standardized management processes and evaluation mechanisms should also be refined through the establishment of standardized home care service workflows and the clarification of operational requirements for data recording, condition feedback, and treatment plan adjustments. Such measures can ensure traceability and controllability throughout the entire service process. In addition, a scientific health management efficacy evaluation system should be developed by incorporating key indicators such as glycemic control achievement rate, complication incidence rate, patient self-management capacity, quality of life, and patient satisfaction. Through regular assessments, management outcomes can be comprehensively and objectively evaluated, while identified issues can be promptly addressed to optimize the service system. This approach can establish a closed-loop management cycle of "standard formulation–service implementation–evaluation–optimization," thereby promoting the standardized development of home-based diabetes care and health management.

5.2. Development of a precision-based home-based diabetes care and health management service model

To establish a precision-based home-based diabetes care and health management service model, the primary task is to conduct accurate patient needs assessment through methods such as questionnaires, home visits, and disease analysis. This enables comprehensive collection of patient information, including age, disease duration, complication status, lifestyle habits, and individualized requirements, to create personalized health records. Based on the assessment results, patients are categorized into different groups, and tailored home care plans are developed for each group to achieve precise service matching and address the shortcomings of a one-size-fits-all approach. Leveraging digital technologies, a digital platform for home-based diabetes care and health management is established, integrating functions such as online consultation, real-time monitoring, remote guidance, and follow-up appointment reminders. This facilitates real-time submission of patient health data and online physician guidance, enhancing service timeliness and convenience. Concurrently, service resource allocation is optimized to extend high-quality home care services to rural and remote areas through the establishment of community-based home care service stations and mobile service initiatives, thereby addressing the scarcity of primary care resources. Additionally, a dynamic disease monitoring and service plan adjustment mechanism is implemented to promptly optimize care protocols based on patient condition changes and care implementation outcomes, ensuring dynamic and precise service delivery.

5.3. Strengthening the system for cultivating home-based self-health management competencies in diabetic patients

A systematic patient health knowledge training system should be established, focusing on core topics such as blood glucose monitoring, medication adherence, dietary regulation, exercise guidance, and complication prevention. Tiered and categorized training programs tailored to patients of different ages and educational backgrounds should be developed, while diverse instructional formats, including specialized lectures, practical drills, illustrated manuals, and short videos, should be adopted to integrate theoretical knowledge with hands-on skills. These measures can enable patients to rapidly acquire essential home care knowledge and practical competencies. In addition, personalized discharge guidance should be provided upon hospital release, and seamless continuity of subsequent training should be ensured to maintain the consistency and effectiveness of patient education.

A sustainable patient behavior intervention and family support mechanism should also be established by implementing continuous interventions through regular home visits, real-time online monitoring, and family follow-ups. Such measures can promptly correct nonstandard care practices and guide patients toward long-term adherence to evidence-based self-management strategies. Concurrently, training and guidance for family members should be strengthened to improve their caregiving capabilities and supervision awareness, thereby fostering a strong family support system that enables effective patient care and monitoring while enhancing patients' motivation and initiative in self-management. Furthermore, targeted psychological counseling services should be provided to alleviate negative emotions such as anxiety and depression, strengthen patients' confidence in disease management, and enhance their self-health management capabilities.

6. Conclusion

Enhancing the efficacy of home-based diabetes care and health management from the perspective of chronic disease management constitutes a pivotal measure for improving the diabetes chronic disease prevention and control system, directly impacting patients' glycemic control outcomes, complication incidence rates, and quality of life. This study establishes a research framework comprising four dimensions: core concepts, existing challenges, implementation principles, and improvement strategies, delineating the standardized, precise, and sustainable development direction for home-based care and health management. By establishing a standardized service system, implementing tailored service models, and strengthening patients' self-management capabilities, this approach effectively addresses current challenges

such as incomplete systems, imprecise services, and limited patient competence, fostering deep integration of medical-care coordination and autonomous home management. Ultimately, it achieves comprehensive enhancement of home-based diabetes care and health management efficacy, solidifying home-based care as a robust support for diabetes chronic disease prevention and control, thereby elevating the overall effectiveness of diabetes management.

Disclosure statement

The author declares no conflict of interest.

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