Am J Transl Res 2023;15(4):2957-2969
www.ajtr.org /ISSN:1943-8141/AJTR0147863

Original Article

Effect of new nurse-led healthcare collaborative model on self-efficacy, compliance and quality of life in patients with chronic diseases

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Received November 18, 2022; Accepted February 20, 2023; Epub April 15, 2023; Published April 30, 2023

Abstract: Objective: To explore the impact of routine management compared to case management on social support and self-efficacy of patients with chronic diseases and assess the new nurse-led healthcare collaborative model. Methods: This is a prospective study which was approved by the Biomedical Ethics Committee of Anhui Medical University. A total of 100 patients with chronic diseases who received treatment and care in Hefei First People's Hospital from January 2020 to December 2021 were selected as the study subjects and divided into a control group and an observation group according to the numerical table method, with 50 cases in each group. In the control group, conventional management was implemented, while the observation received a nurse-led healthcare collaborative care, which included community doctors providing treatment services and family doctors contracting to manage care. The patients in the two groups were compared in terms of self-efficacy, self-management ability, social support, and their attendance. Results: Before the intervention, there was no statistically significant difference in self-efficacy, compliance and quality of life scores between the two groups ($P>0.05$). After the intervention, self-efficacy, compliance and quality of life scores were significantly higher in the observation group than those in the control group, with statistically significant differences ($P<0.05$). A statistical assessment of the transfer of patients from the community to the hospital was also conducted for both groups, and it was found that the proportion of patients transferred from the community to the hospital was significantly higher in the observation group compared to that in the control group after surgery, with statistically significant differences in hospital costs, hospital days and readmission rates between the two groups ($P<0.05$). The proportion of patients transferred from the hospital to nursing home increased by 72.2% in the observation group compared to only 35.5% in the control group, and the discharge rate (home care) was significantly higher in the observation group ($P<0.05$). Conclusion: This study provides some references for the effective management of patients with chronic diseases. By comparing the data from the conventional and case care management models, it can be found that the use of a nurse-led healthcare collaborative model meets the acute medical and nursing service needs of older people, improves timely access to medical and nursing resources, and effectively improves self-efficacy, compliance and quality of life in patients with chronic diseases.

Keywords: Healthcare coordination model, self-efficacy, compliance, quality of life, referral

Introduction

At present, China is rapidly entering the stage of aging, with 190.64 million people aged 65 or above by 2020, accounting for 13.5% of the total population [1]. The prevalence of chronic diseases among the elderly aged 60 and above is as high as 74.45%, and the rational use of medical resources and the treatment costs for the elderly have become important social concerns [2, 3]. Integrated care has become an effective solution to this issue, and its advantages in systematic, continuous and efficient operations have been widely recognized by international community [4].

In China, the integration of chronic diseases in medical and health care is also explored in a multi-linked manner, but there are problems such as difficulties in coordination and the lack

of long-term mechanism [5]. The contract family doctor service model in many places has problems such as heavy workload, low income and insufficient social recognition [6-8]. In order to address the needs of medical care in elderly patients with chronic disease, a model of integrated care for the elderly in urban communities has been built. In this case, the social service department is responsible for sending out medical specialists, liaising with patients for referrals and providing home services [9]. However, there are problems such as imprecise match of supply and demand in terms of risk stratification assessment of conditions, follow-up of team referrals and multiple needs of residents, which make the linkage management have certain shortcomings. This study constructed an integrated care model for the elderly in urban communities based on the "medical and nursing integration-quadratic linkage", to improve the management of chronic diseases in the elderly. This nurse-led healthcare collaborative model is to precisely navigate medical resources in the areas of disease risk assessment, entry and exit preparation services, medical and nursing integration and home care. It also includes corresponding service connotations, nursing quality evaluation indexes and standards on a tiered intervention program, so as to provide sustainable nursing services for elderly patients with chronic diseases both inside and outside the hospital, online and offline. The medical resource utilization of elderly patients with chronic disease before and after the implementation of the model was analyzed to provide an empirical basis for the advanced care practice of elderly with chronic disease and the establishment of practicing nurses in China.

Compared to the traditional hospital-based management model, hospital-based case management is patient-centered, with the healthcare providers and patients working together to manage and control the disease. This model is humanized, personalized and targeted. By getting to know the patients and their actual needs, developing a personalized healthcare plan with the patient, and monitoring the conditions of the patient in real time, the care is holistic and continuous and can effectively compensate for the shortcomings of conventional management model. In addition, patients' conditions and behaviors are directly related to their lives, the development of their families, and even the society. The implementation of effective management for patients with chronic diseases is of far-reaching importance. Therefore, this study explored the value of conventional social management with case management on psychological support, self-efficacy, self-management skills and psychological flexibility in patients with chronic diseases.

Materials and methods

Patients and treatments

This is a prospective study which was approved by the Biomedical Ethics Committee of Anhui Medical University. A total of 100 patients with chronic diseases were selected as the study subjects. Among them, 50 patients who received nurse-led and contracted family doctor-assisted care at Dayang Town, Luyang District, Hefei City, Anhui Province Health Service Center from January 2020 to December 2021 were included in the observation group, with 35 males and 15 females, aged 67-80 years, and a mean age of 72.17±3.42 years. Their body mass index (BMI) was 17-25 kg/m^2, with a mean BMI of 22.13±1.35 kg/m^2. The other 50 patients treated routinely from January 2019 to December 2019 were included in the control group, with 37 male cases and 13 female cases, aged 71-83 years, and a mean age of 80.14±1.16 years. Their BMI was 18-25 kg/m^2, with a mean BMI of 22.52±3.6 kg/m^2. Health resource utilization indicators such as the number of referrals, home visits, hospital costs, hospital days, readmissions and satisfaction were recorded.

Inclusion criteria: (1) patients met the diagnostic criteria for chronic diseases and confirmed by examinations at the health center; (2) patients were able to give normal communication and feedback; (3) patients were 65 years old or older; (4) patients had resided in Dayang town for one year or longer; (5) patients signed an informed consent form; (6) the chronic diseases targeted are hypertension and diabetes.

The exclusion criteria: (1) those who had psychiatric abnormalities; (2) those who showed severe aphasia, dementia or cognitive dysfunction; (3) those who were receiving other motor and psychological interventions during the study period.

The control group received routine nursing, including adjusting indoor temperature and humidity, ensuring peaceful environment of the ward and examination room, regular ventilation, issuing disease brochures to patients, answering patients' questions, and visiting the ward on time. On the basis of customary nursing in the control group, the observation group received interventions in the new nurse-led healthcare collaborative model. A nursing team was established as the main part, and regular nursing from family contracted doctor was the auxiliary part. The nursing team allocated patients and special nursing tasks to each group. The nursing frequency was three times a week, 40 minutes each time. The specific work was divided into the following steps: (1) The nurses explained pathogenesis, diagnostic and intervention process as well as relevant precautions to patients and their families in detail, using slides, short videos, pictures and books as tools. The patients were guided to introduce their personal treatment experience through seminars. (2) The team formulated personalized medication and diet plans according to patients' psychological and behavioral changes, and guided patients' family members to participate in the care. (3) The nurses guided patients to adjust negative emotions and treatment mentality, helped them to actively cooperate with treatment, and regularly organized the patients to summarize their experience. The study participants were followed up for 2 years, t_1 is the period of time when community health service centers of the control group will be implemented in the family doctor management mode in 2020, and t_2 is the period of time when community health service centers of the control group will be implemented in the family doctor management mode in 2021. This management model is currently limited to the regions of China.

Indicators

The observation indicators included the following. (1) Patients' self-efficacy was assessed using the General Self-Efficacy Scale (GSES) at both time points. The total score is 40 points, and the self-efficacy is positively correlated with the score. (2) Patients' adherence was assessed using the Morisky Medication Adherence Scale (MMAS-8), with a total score of 8 points. The first 7 items are 'yes' or 'no' questions, with 0 or 1 point for each item. The eighth item has 5 options according to their frequency of occurrence, with scores of 1, 0.75, 0.5, 0.25 and 0, respectively. Compliance to medication is positively correlated with the score. (3) The World Health Organization Quality of Life Scale (WQL-100) was used to evaluate patients' quality of life at the 2 time points. The scale evaluates 3 dimensions (independence, psychological status and comfort of living) using a 5-point rating system, with a total of 25 items and 25-125 points. The quality of life is positively correlated with the score.

Prognostic evaluation

One week after admission, the patient's physical signs, blood gas indicators, inflammatory indicators blood sugar and blood pressure and chronic disease status were assessed. Patients with varying degrees of improvement or full recovery were assessed as having a "good prognosis", and those with no significant improvement, deterioration, or even death were assessed as having a "poor prognosis".

General information

The nurse-led healthcare collaborative model was constructed and operated during January 2020 - December 2021, and the family physician contracting model was operated during January 2019 - December 2019. The health resource utilization indexes, such as the number of inter-transfers, home visits, hospitalization costs, hospitalization days, readmissions and satisfaction, were compared in patients under the operations of the two models.

Model construction

Based on the quality chain management theory and the design concept of graded diagnosis and treatment and graded care of chronic diseases, the model is constructed according to the needs of elderly patients with chronic disease in the community to identify the key linkage points in the whole process of chronic disease management for the elderly, and construct a medical and nursing care collaboration model led by nurses for elderly chronic diseases (**Figure 1**). Full-time and dedicated nurses collaborated with the medical and nursing specialist outpatient teams of tertiary hospitals and community medical teams [10]. Three rings of graded diagnosis and treatment were constructed. The first ring was hospitals and community health service centers, the second ring was hospitals and nursing homes for extended

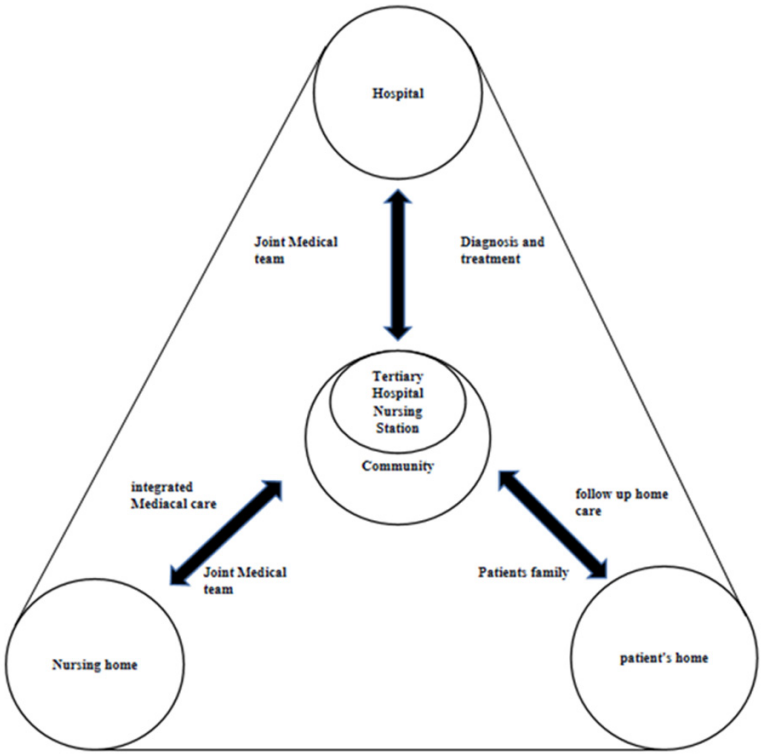

Figure 1. Nurse-led healthcare collaboration model for geriatric chronic diseases.

care, and the third ring was home care by family nurses. The dilemma of medical and extended care needs of elderly patients with chronic illnesses is addressed.

Model operation

Criteria for senior nurses transferring to community health service centers: nurses with more than 15 years of clinical work experience; geriatric nurses; specialist nurses in wound trauma, diabetes, cardiovascular or critical care; nurses with master's degree; nurses with professional and technical titles of competent nurse practitioner; nurses with strong communication and coordination skills [10].

Division of labor and health care coordination

Nurses in hospitals were full-timely relocated to community health service centers. Nursing stations, chronic disease care outpatient and one-stop referral nursing positions were set up. They manage high-risk groups in collaboration with hospital teams of experts from tertiary hospitals. In cooperation with the medical nursing team of the hospital and the medical nursing team of the community health service center, the family medical nursing team was formed to provide medical nursing services for the elderly patients with chronic diseases in the region.

The nursing outpatient positions were mainly selected senior hospital nurses, who carried out regular weekly outpatient services for high-risk patients with chronic diseases (hypertension and diabetes) in the community, provided timely face-to-face nursing needs assessment, and precisely matched the corresponding medical and nursing teams to give personalized interventions.

One-stop referral nursing positions were held by nurses transferred from the hospital, who were responsible for hospital and community referrals, one-stop admissions, discharge preparations, tracking referred patients, visiting discharged patients, collaborating with hospital physician teams, liaising and consulting with patients in the community, and initiating green channel referral procedures when necessary.

The combined medical and nursing care positions were mainly responsible for nursing homes and patients living at home. A home service team was formed by the combined medical and nursing care team and community health service center. This team was responsible for graded care assessment and services, carrying out pre-home telephone or on-site assessment, providing 18 home care services and life care for the disabled, demented, alone and single elderly, and customizing personalized care service plans. They also provided assessment of the aging environment, popularized scientific guidance on home care techniques, such as elderly feeding techniques, position transfer techniques, incontinence care techniques and hospice care.

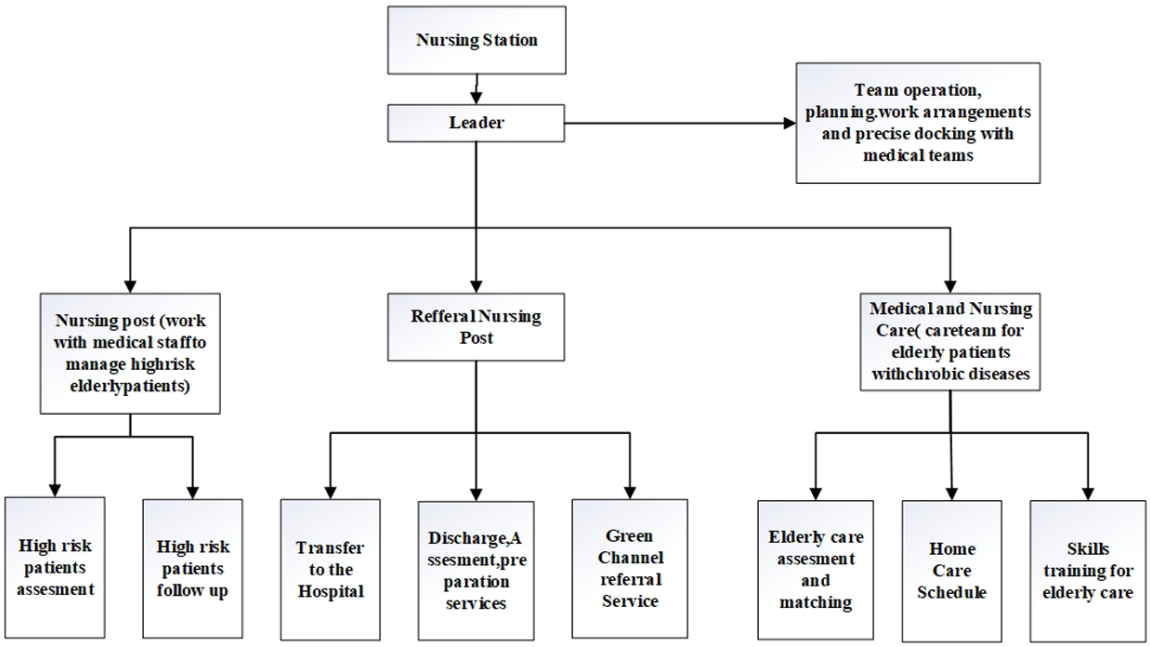

Figure 2. Collaborative working structure of nursing station.

Mode operation

Through the nursing station (**Figure 2**), which plays a synergistic role with other medical care teams, acute medical care, chronic disease prevention, combined medical and nursing care and home medical care services were provided to elderly patients with chronic disease in hospitals, community, nursing homes and at home. A linkage loops were established between hospitals, nursing homes, communities and homes, i.e., community-hospital graded treatment, and precise navigation and integration of resources. The team dynamically managed the service demand of elderly patients with chronic disease and established a closed loop for the hierarchical delivery and flow of care for elderly patients among the four elements.

Operational evaluation

The study period was from January 2020 to December 2021.

Evaluation of hospital-community graded diagnosis and treatment: Through the hospital-community referral platform, the number of elderly people who were transferred from community health service centers to general tertiary hospitals for hospitalization, hospitalization days, hospitalization costs, readmission rate and outpatient checkups was recorded. Also, the number of elderly people who were transferred from hospitals to community health service centers was recorded.

Evaluation of nursing homes on the functions of carrying out rehabilitation, care of the elderly with disability and dementia, and hospice care: the number of patients admitted to comprehensive tertiary care hospitals and home services referred to medical and nursing homes were collected through nursing home data reports.

Evaluation of home nursing services by the Hospital Social Service Department: The number of home nursing visits and programs in five communities were collected through the data reports of Social Service Department. A multifactorial analysis was conducted to collate statistical information on patients and possible factors affecting the treatment of patients and caregivers with chronic diseases, such as the patient's age, other underlying illnesses, the interval between caregiver early warning assessments and the duration of care, in order to find a relationship between them (See **Table 4**).

Patient satisfaction with the medical care. Self-developed forms were used for satisfaction

Table 1. Referrals from tertiary hospitals and community health centers

Group	Community Health Center Upward Referral Hospital Clinic	Community health center upward hospitalization	Hospital downward referral to community health center clinics
Control group	37.9% (106/280)	26.4% (74/280)	30.7% (86/280)
Observation group			
First year of observation	43.9% (130/296)	17.6% (52/296)[a]	35.1% (104/296)
Second year of observation	49.2% (179/364)[a]	11.8% (43/364)[a,b]	69.2% (252/364)[a,b]
X^2	8.232	22.974	42.273
P	0.016	0.001	0.001

Note: a: Significantly different from the control group; b: Significantly different from the first year of observation.

Table 2. Health resource utilization of elderly patients with chronic diseases

Group	Hospitalization costs (median)	Inpatient days (median)	Number of rehospitalizations (median)
Control group	8853.37	20	3
Observation group			
First year of observation	7397.56	9**	1**
Second year of observation	2315.69**	9**	1**
H (K)	51.711	54.440	65.248
P	<0.001	<0.001	<0.001

**means the difference is significant at the 0.01 level.

evaluation in elderly patients and their families in hospital, nursing home, community, and home. The satisfaction rate was calculated.

Statistical methods

The data were input into EpiData 3.0 software by two researchers. Statistical analysis was performed using SPSS 22.0. The measurement data were expressed as $\bar{x} \pm sd$ and subjected to t-test. Counting data were expressed as rates and processed by χ^2 test or Fisher test. The comparison among three groups or above was done by ANOVA. The difference was statistically significant when $P<0.05$.

Results

Mutual referrals between hospitals and community health centers

Before and after the operation of the nurse-led healthcare collaborative model, there were 86, 104 and 252 hospital downward referrals to community health service centers, respectively, and 106, 130 and 179 outpatient referrals from community health service centers to hospitals, respectively, showing a significant upward trend year by year, with statistically significant differences between the groups ($P<0.05$; **Table 1**). The median hospitalization cost, hospital days and number of rehospitalizations all decreased, and the differences between the groups were statistically significant ($P<0.05$; **Table 2**).

Variable analysis of factors affecting the prognosis of patients with chronic diseases

According to the analysis, the differences in age, basic diseases, early warning assessment interval, junior nurse between the control and observation groups were statistically significant ($P<0.05$; **Table 3**).

The statistically significant factors in the univariate analysis were used as independent variables in further multi-factor logistic regression analysis. The results showed that the factors influencing the prognosis of patients with chronic disease were age ≥75 years, comorbid underlying disease, hyponatremia, hypoalbuminemia, interval between early warning assessments and fewer seniority nurses ($P<0.05$; **Table 4**).

Table 3. Univariate analysis of prognostic factors in elderly patients with chronic diseases in the community

Factors of analysis	Category	Control group	Observation group	χ^2	P
Sex	Male	37	35	0.025	0.725
	Female	13	15		
Age	≥75	24	38	13.795	0.004
	<75	26	12		
Basic diseases	yes	32	40	14.015	0.015
	no	18	10		
Hyponatremia	yes	22	16	0.924	0.885
	no	28	34		
Hypoalbuminemia	yes	17	10	0.831	0.738
	no	33	40		
Early warning assessment interval (d)	≥2	39	18	33.285	0.001
	<2	11	32		
Junior Nurse (year)	≥5	21	33	31.054	0.003
	<5	29	27		

Table 4. Multi-factor logistic regression analysis of factors influencing the prognosis of patients with chronic diseases

Factors of analysis	β	SE	Wald χ^2	P
Age (≥75)	0.764	0.318	7.156	0.011
Basic diseases	0.726	0.305	8.935	0.006
Early warning assessment interval (d)	0.765	0.381	10.973	0.001
Junior Nurse (year)	0.739	0.342	12.005	0.001

Table 5. Hospital-nursing home reciprocal transfers

Year	Nursing home upward bound hospital	Hospital downward transfer nursing home
Control group	10	36
Observation group		
First year of observation	12	62
Second year of observation	15	84
Year-on-year increase over the previous year	20%/25%	72.2%/35.5%

Table 6. Hospital patient sources of integrated medical and nursing care before and after the operation of the nurse-led healthcare collaborative model

Group	Home (n, %)	Nursing homes (n, %)
Control group	60.1 (74/123)	10.6% (13/123)
Observation group		
First year of observation	48% (72/150)[a]	10.7% (16/150)
Second year of observation	39.9% (65/163)[a,b]	8.6% (14/163)
χ^2	93.315	0.476
P	0.001	0.788

Note: a: Significantly different from the year before the run; b: Significantly different from the year after the run.

Referrals from medical and nursing homes

The overall base of nursing home to hospitals transfers was low, and the number of referrals to hospitals increased by 20% and 25% year-on-year (**Table 5**); while hospital to nursing homes transfers increased by 72.2% and 35.5% year-on-year (**Table 5**). Statistics on the source distribution showed a gradual decrease in home to nursing homes transfers and a steady increase in general hospitals to nursing homes transfers (**Table 6**), with statistically significant differences between groups (P<0.05). The number of nursing homes to other nursing homes transfers was relatively stable, and the differences were not statistically significant.

Home care in-home

Among the care services, timely change of medica-

Table 7. In-home care

Group	Gastric tube replacement	Change of medicine and removal of stitches	Urinary catheter replacement	Intravenous blood collection
Control group	44.1% (79/179)	24.6% (44/179)	14.5% (26/179)	12.8% (23/179)
Observation group				
First year of observation	55.6% (105/189)[a]	32.8% (62/189)	21.2% (40/189)	20.6% (39/189)[a]
Second year of observation	64.7% (154/238)[a]	57.1% (136/238)[a,b]	28.9% (69/238)[a]	15.5% (37/238)
X^2	17.533	50.979	12.545	4.256
P	0.001	0.001	0.001	0.119

Note: a: Significantly different from the control group; b: Significantly different from the first year of observation.

Table 8. Comparison of patient and family satisfaction before and after model operation (%)

Indicators	Control group	First year of observation	Second year of observation	Year-over-year growth
Hospital	90.73	97.5	98.2	7.44/0.72
Nursing Home	92.63	99.5	99.7	7.42/0.20
Community Health				
Service Center	90.24	95.3	96.1	5.61/0.84
Home	91.2	99.8	99.9	9.43/0.10

tion and physiotherapy were the most common ones, and there was an upward trend in the second year of team operation compared with those in the first year, and the differences between groups were statistically significant (P<0.05; **Table 7**).

Patient satisfaction

A satisfaction survey was conducted using a self-developed questionnaire in patients and their families in hospitals, nursing homes, community and homes (**Table 8**), and the results showed that satisfaction increased year by year, with an increase of 7.46% and 0.72% in hospitals, 7.42% and 0.2% in nursing homes, 5.61% and 0.84% in communities, and 9.43% and 0.1% in homes, respectively, when comparing with the previous year.

Comparison of self-efficacy at two study time points

The self-efficacy of patients in both groups showed an increasing trend, and the self-efficacy scores at t_1-t_2 in the observation group were higher than those in the control group, with statistically significant differences (P<0.05), as shown in **Table 9**.

Comparison of compliance at two study time points

The compliance score increased gradually in both the control and observation groups from t_1-t_2. There was also a significant difference (P<0.05) between the observation group and the control group at t_1. See **Table 10**.

Both groups showed an increase in quality of life, and the observation group had higher stand-alone score, psychological and comfort scores than the control group from t_1 to t_2, and the differences were statistically significant (P<0.05). See **Table 11**.

Discussion

Nurse-led healthcare collaboration model for stratified management and needs of older patients with chronic conditions has attracted more and more attention.

Data from the Ring One showed that there was an increase in the number of patients in the observation group who were transferred to the hospital outpatient. The hospital inpatient number, hospital inpatient costs, hospital days, and readmissions decreased in the observation group when comparing to the control group. Nurse-led health care collaborative model set chronic disease care clinics in the community, carried out specialized assessments and identification of access blockages, collaborated with hospital specialist teams and community GP teams to manage geriatric chronic diseases, integrated multidisciplinary resources to consulate and initiate referrals,

Table 9. Changes in self-efficacy scores at two study time points

Group	Point of time	Self-efficacy score
Observation group	t_1	11.45±1.15
	t_2	22.42±1.02**
Control group	t_1	10.13±1.34
	t_2	16.43±1.13**
$F_{\text{time point}}$		513.254
$P_{\text{time point}}$		<0.001
$F_{\text{time point}}$		534.575
$P_{\text{time point}}$		<0.001

**means the difference is significant at the 0.01 level. The two groups were followed up one year before the intervention, whose time period was recorded as t_1, and the two groups were returned one year after the intervention, whose time period was recorded as t_2.

Table 10. Comparison of adherence between the two study time points

Group	Point of time	Compliance score
Observation group	t_1	2.16±0.33
	t_2	3.42±0.10**
Control group	t_1	2.13±0.35
	t_2	3.03±0.27**
$F_{\text{time point}}$		463.165
$P_{\text{time point}}$		<0.001
$F_{\text{time point}}$		444.146
$P_{\text{time point}}$		<0.001

**means the difference is significant at the 0.01 level. The two groups were followed up one year before the intervention, whose time period was recorded as t_1, and the two groups were returned one year after the intervention, whose time period was recorded as t_2.

increased the referral rate between community and hospital outpatient clinics, formed a mature and convenient referral pathway, and reduced patients' hospitalization costs.

Relying on the quality resources, hospitals took the lead in setting up a specialist nurse studio in the community in 2017 to provide tertiary disease prevention guidance and education for community residents in the field of diabetes care and other specialist care [11]. The nurse-led medical care coordinative model integrates the most cost-effective and shortest-cycle extended medical care according to the function of the linkage ring, referral criteria and resource allocation. It is the key to the "acute and critical medical care and transitional medical care" in the model, bridging the gap between the community and the acute medical care, extended care, as well as medium- and long-term care in the elderly. Ouwens et al. have summarized the effects of integrated care programs on chronic diseases and found positive effects such as lower hospitalization rates, less costs, better patient health, higher quality of life and greater satisfaction [12]. An integrated care strategy implemented in Australia showed reduced number of emergency department visits for older patients and improved the quality of life of participants [13]. It was suggested that high-intensity multifactorial and multidisciplinary interventions might be effective in reducing readmission rates for older patients without increasing costs [14]. Wei et al. concluded that the application of community hypertension management with advanced practice nurses as a link was effective. Li et al. reported that the cluster management model could significantly improve the level of disease-related knowledge and self-management ability of elderly patients with type 2 diabetes in the community, because it was beneficial to patients' glycemic control [15, 16]. The result of this study is basically consistent with the findings of other studies.

The nurse-led health care collaborative model operates to closely link the medical care pathways among hospitals, nursing homes, the community and at home for elderly patients.

The results of the Ring 2 showed obviously increased hospitals to nursing homes transfers, suggesting that the nurse-led healthcare collaborative model played an important role in medical rehabilitation care in a hierarchical manner. The unaccompanied medical and nursing care services in nursing homes effectively meet the rehabilitation and nursing needs of patients with chronic diseases, and provide stable acute treatment to avoid overtreatment. Home and nursing facility referrals to nursing homes were on the decline, suggesting that in nurse-led healthcare collaborative model, training of geriatric nursing techniques improved the skills of caregivers and they were able to provide cares to meet the diversified needs of elderly patients. The number of home care visits was increasing year by year, and the primary care services were changing gastric tubes,

Table 11. Changes in quality of life at different points in time

Group	Point of time	Stand-alone score	Psychology	Life comfort
Observation group	t_1	9.22±1.04	25.46±1.05	9.26±1.13
	t_2	19.38±1.24**	52.19±4.14**	22.18±1.34**
Control group	t_1	9.05±1.01	25.15±1.66	9.19±1.01
	t_2	15.75±1.37**	44.50±3.68**	18.46±1.25**
$F_{\text{time point}}$		583.106	555.147	603.128
$P_{\text{time point}}$		<0.001	<0.001	<0.001
$F_{\text{time point}}$		423.467	564.336	567.224
$P_{\text{time point}}$		<0.001	<0.001	<0.001

**means the difference is significant at the 0.01 level. t_1 is the period of time when community health service centers of the control group will be implemented in the family doctor management mode in 2020, and t_2 is the period of time when community health service centers of the control group will be implemented in the family doctor management mode in 2021.

wound dressing and catheter replacement. In this case, the disabled or elderly people with limited mobility can have professional support services at home, reducing the number of trips to and from hospitals and the cost, and improving the efficiency of care.

The nurse-led health care collaborative model enhanced the patient care experience by providing timely and accessible communication with the patients.

The nurse-led healthcare collaborative model upgrades family nursing in the hospital's social service department, broadens the scope of practice, increases work content, more accurately identifies patients' health needs, and applies its professional capabilities in independent assessment, clinical care, clinical decision-making and leadership to give support when primary care physicians lack service capability and when hospitals lack expert resources.

Studies have shown that the care time from health care teams for patients outside the hospital and in the community was crucial to the management of chronic diseases in the elderly. The nurse-led health care collaborative model in this study assumed the management of chronic disease in community. Moreover, it undertakes the specialized assessment of the first consultation of the elderly in the community, integrates and optimizes the quadratic medical and nursing resources of hospitals, nursing homes, communities and homes. It provides patients with face-to-face nursing setting, which has become the main responsible place for the health management of elderly patients. This also enhanced patients' experience of medical care [17].

The nurse-led health care collaborative model has been operating for two years, focusing on accurate assessment of patient needs, giving low-cost and high-efficiency services, integrating and optimizing the pathways among hospitals, communities, nursing homes and homes, accurately navigating medical care resources, dynamically managing the follow-up feedback information in real time, and realizing a closed loop of chronic disease care for the elderly in the region. However, there are still some shortcomings, for example, the area where this study was carried out is only the medical association community and its subordinate nursing homes, but not the medical association community and the health care integration institution. Also, the medical caregiver teams still have a shortage of staff in the medical care home service.

This study showed significantly higher standalone, psychological and comfort scores in the observation group than those in the control group after the intervention, suggesting that nurses combined with family physician care management can effectively improve the self-efficacy of patients with chronic diseases. Due to the unique nature of the patient population, patients with chronic diseases not only endure the pain caused by the disease itself, but also worry that they may become a long-term burden to the people around them. Their psychological and behavioral susceptibility to negative emotions can lead to a reduced sense of self-efficacy and an inability to deal with existing health problems [18]. Studies have shown that by improving patients' self-efficacy, patients with chronic diseases can be driven to cooperate with treatment and care, improve confidence and competence in fighting their illnesses, and thus increase selfcare [19]. In this study, the observation group was educated on self-management by having more exchanges and giving detailed psychological counselling. In addition, according to the patients' wishes,

peer education was adopted to view videos of positive cases, and they were encouraged to speak freely during psychological counselling to reduce the stress, which helped them to actively cooperate with the treatment and to manage their own health [20].

Our results showed significantly higher self-efficacy, compliance and quality of life scores in the observation group than those in the control group after the intervention, indicating that community hospitals combined with family doctor care management can be effective in improving chronic diseases. The analysis may be limited, as only chronic disease hospitals were surveyed and only hypertension and diabetes patients were involved. There are some differences among ethnic groups in terms of population distribution, customs, and language environment [21]. Compared with the traditional management model, the special management model is able to deal with changes in a timely manner and provides patients with personalized management services and professional support [22]. In addition, this transfer analysis model is useful in facilitating patients' choice of the appropriate facility to visit. There may be inadequate communication between healthcare professionals and patients, and a lack of understanding and acceptance of the self-management content by patients [23]. Patients with chronic diseases often neglect daily life management such as diet, smoking, alcohol consumption, sleep and exercise. In addition, the progression of illness is slow. Most patients are reluctant to have others around for long periods of time when they are ill. After knowing their condition, they are reluctant to ask for help [24]. Therefore, it is recommended that medical workers provide personalized health guidance and assistance with a patient-centered approach, such as assigning medical worker of the same ethnicity or gender as the patient to provide health education and symptom management, and improve medication adherence and lifestyle behaviors [25]. Furthermore, patients are provided with adequate medical information and emotional support. With informed consent, patients can communicate with people who voluntarily help them establish a good social support system, promote awareness of self-management and improve their self-management skills [26]. In this study, the case management team was patient-centered and worked with the patient to develop a management plan by assessing and discussing the patient's family situation, disease status and self-management skills. Members of the case management team provided patients with bilingual health education and publicity materials, and gave personalized health guidance and assistance to patients through micro-consultations, telephone follow-up visits, peer education and volunteer activities. Subsequently, multidisciplinary approaches such as pharmacology, psychology and nutrition were used in the treatment [27]. It enables health care professionals to communicate with patients and their families, understand patients' needs and provide medical, financial, interpersonal and information support, so as to effectively improve patients' self-management skills.

This study is limited. A controlled trial was used in this study. There may be some confounding factors in the intervention for both groups, which may result in bias. Therefore, in future research work, the confounding factors should be controlled as far as possible to make the findings more reliable. The implementation of the case management model should be long term and consistent. However, due to time constraints, the intervention period in this study was relatively short. It is hoped that this model can be implemented long-termly in the future to explore the advantages of the personalized management model and to improve the patients' self-management skills and quality of life. It is recommended to repeat this pilot study in the future with different disease populations in different regions to further prove the efficacy of the nursing model.

Acknowledgements

The Third Affiliated Hospital of Anhui Medical University's basic and clinical cooperative research promotion plan cultivation special funding project (2022sfy011) and Open Project of Health Policy Research Center of Anhui Medical University (2022wszc10).

Disclosure of conflict of interest

None.

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