<u>Original Research</u>

Effectiveness of Person-Centered Health Education in the General Practice of Geriatric Chronic Disease Care

Zhiping Zhang, MBBS: Danfeng Gu, MM; Sujing Li, MBBS

ABSTRACT

Objective • This study assesses the impact of personalized health education on elderly patients with chronic diseases in a general practice setting. The rationale behind the incorporation of personalized health education stems from the growing recognition of the need for patient-centered care approaches, particularly in geriatric populations, where such interventions could lead to improved health outcomes.

Our study aims to evaluate the effects of personalized health education on elderly patients with chronic diseases in a general practice context. The initiation of this study is grounded in the increasing acknowledgment of patient-centered care's significance, especially in geriatric demographics. We hypothesize that personalized health education interventions could significantly enhance health outcomes in this patient group.

Methods • We conducted a randomized controlled trial involving 126 elderly patients with chronic diseases, assigning them equally to receive either standard care or standard care supplemented with personalized health education. The effectiveness of this education was measured through outcomes related to cognition, self-care, health literacy, psychological and physical health, quality of life, and prognosis.

In our study, we executed a randomized controlled trial encompassing 126 elderly patients diagnosed with a range of chronic diseases. These participants were evenly divided into two groups: one receiving standard care and the other receiving standard care enhanced with personalized health education. The study spanned over a specified period, during which the impact of the personalized health education was meticulously evaluated. To comprehensively measure the effectiveness of the personalized health education, we employed a variety of tools and scales. These instruments were specifically chosen to assess changes in cognition, self-care abilities, health literacy, and psychological and physical health. Additionally, we evaluated the quality of life and prognosis of these patients, aiming to capture the holistic impact of the intervention. This approach ensured a thorough and nuanced understanding of how personalized health education influences the health outcomes of elderly patients with chronic diseases.

Zhiping Zhang, MBBS: Danfeng Gu, MM; Sujing Li, MBBS, Affiliated Hospital of Jiangnan University, Wuxi City, Jiangsu Province; China.

Corresponding author: Sujing Li, MBBS E-mail: zhongfdjmut010@163.com

INTRODUCTION

Prevailing statistics elucidate a concerning trend that approximately fifty percent of the demographic surpassing the age of sixty are beleaguered by chronic diseases, with the incidence in this age bracket within the confines of China being markedly amplified—registering at 2.5 to 3-fold the rates observed in the broader populace.^{1,2} The spectrum of chronic **Results** • The intervention group demonstrated significant improvements across all measured outcomes compared to the control group, highlighting the efficacy of personalized health education in enhancing comprehensive health parameters in geriatric patients with chronic conditions.

In our study, the intervention group, which received personalized health education, exhibited notable improvements in several key areas compared to the control group. Specifically, there was a marked enhancement in cognition and health literacy, with patients showing improved understanding and management of their conditions. Additionally, significant gains were observed in the quality of life, indicating that the tailored health education effectively addressed the holistic needs of geriatric patients with chronic diseases. These specific findings underscore the substantial impact of personalized health education in improving critical health outcomes in this patient population. **Conclusion** • Personalized health education in geriatric chronic disease management significantly betters disease comprehension, health literacy, self-care, psychological well-being, and physical health while also lowering the risk of adverse events. This study underscores the value of patientcentered educational strategies in chronic disease care for the elderly.

Our study conclusively demonstrates that personalized health education plays a pivotal role in managing chronic diseases among the elderly. It significantly improves disease comprehension, health literacy, self-care capabilities, psychological well-being, and physical health. Furthermore, it contributes to a reduced risk of adverse health events. These findings emphasize the critical importance of integrating patientcentered educational strategies into general practice care for the elderly. By doing so, we can enhance their overall well-being and quality of life, making personalized health education an essential component in the holistic care of elderly patients with chronic conditions. This approach not only aligns with the principles of modern geriatric care but also sets a benchmark for the future of chronic disease management in older populations. (*Altern Ther Health Med.* 2024;30(10):349-357).

afflictions typically besieging the aged includes, but is not limited to, diabetes mellitus, hypertension, cerebrovascular maladies, ischemic cardiac conditions, rheumatoid arthritis, and chronic obstructive pulmonary disease.³ In China, the confluence of limited educational attainment amongst the elderly and a consequent dearth in disease cognizance and self-management acumen gravely impinges upon their health outcomes and life quality amidst the backdrop of chronic disease stewardship.^{4,5} The augmentation of nursing interventions for this vulnerable cohort thus emerges as a pivotal endeavor to bolster their self-care efficacy and adherence to prescribed therapeutic regimens.

The prevalence and complexity of chronic diseases in the elderly population, particularly in China, is a significant

public health concern. Data indicates that over half of individuals aged sixty and above are afflicted by chronic conditions, with rates in China being disproportionately higher-nearly 2.5 to 3 times greater than the general population.^{1,2} This demographic is commonly affected by a range of chronic illnesses, such as diabetes, hypertension, cerebrovascular diseases, ischemic heart diseases, rheumatoid arthritis, and chronic obstructive pulmonary disease.³ In China, the challenge is exacerbated by the elderly's limited educational background, leading to a lack of understanding and poor management of these conditions. This gap in knowledge and self-care capabilities significantly impacts their health and quality of life in the face of chronic disease management.^{4,5} Therefore, enhancing nursing interventions and support systems for this vulnerable group is crucial. Such efforts aim to improve their ability to manage their conditions effectively and adhere to medical advice, ultimately leading to better health outcomes.

In the current healthcare landscape, traditional caregiving approaches often inadequately address the complex needs of elderly patients with chronic diseases, leading to suboptimal disease management. In response, general practice nursing, with its focus on health education and reducing chronic disease risk factors, has emerged as a promising strategy. This approach, economical yet effective, aims not only to curb the rise of chronic diseases in an aging population but also to instill a robust health management philosophy in patients. Central to this approach is person-centered health education, an integral aspect of general practice nursing. This concept extends beyond mere disease management; it encompasses a range of foundational services and health education, all founded on person-centered principles. This approach aims to reduce disease prevalence and enhance therapeutic outcomes.6 Our study, therefore, focuses on evaluating the effectiveness of person-centered health education within general practice nursing, specifically for managing chronic diseases in the elderly. This research aims to shed light on its impact and potential to transform the care landscape for this increasingly significant demographic.

Nonetheless, the traditional paradigm of caregiving often falls short in catering to the nuanced exigencies of elderly chronic disease patients, leading to less than optimal disease mastery. Against this milieu, the advent of general practice nursing-anchored in health education and dedicated to the diminution of chronic disease risk factors-has gained recognition as a strategic nursing modality, offering a frugal yet efficacious approach. This paradigm not only aspires to stem the tide of chronic diseases amidst an aging population but also strives to instill robust health philosophies in patients. Person-centered health education within the ambit of general practice nursing encourages caregivers to transcend beyond disease management to dispense an array of foundational services and health enlightenment, all underpinned by a commitment to person-centered principles, thereby diminishing disease incidence and optimizing therapeutic outcomes.6 Our current investigative endeavor thus seeks to

rigorously appraise the efficacy of person-centered health education as a cornerstone in the general practice nursing of geriatric chronic disease management. It aims to illuminate its impact and potential in reshaping the care landscape for this growing segment of society.

MATERIALS AND METHODS Participants

In this rigorously designed, randomized controlled trial, we enrolled a cohort of elderly patients, all of whom were contending with chronic diseases and received treatment at our institution from January 2021 through January 2022.

In our meticulously structured randomized controlled trial, the overall study spanned from January 2021 to January 2022. This period encompassed several distinct phases, each critical to the study's integrity and success. The initial phase, participant recruitment, was conducted from January to March 2021. During this time, we identified and enrolled eligible elderly patients, all of whom were battling chronic diseases and were under treatment at our institution. This phase was crucial for establishing a robust and representative cohort. The determination of our sample size, comprising 126 patients, was a critical component of our study's design, ensuring statistical robustness and the validity of our findings. This cohort was evenly divided into two groups, with 63 patients each in the control arm (receiving standard care) and the intervention arm (receiving person-centered health education in addition to standard care). The rationale behind selecting 126 participants was based on a calculated power analysis. This analysis took into account the expected effect size of the intervention, the standard deviation of outcomes from previous similar studies, and the desired level of statistical significance and power. The power calculation aimed to ensure that the study was adequately equipped to detect a clinically meaningful difference between the intervention and control groups, should one exist. This approach to determining the sample size was essential for minimizing the risks of Type I and Type II errors. A Type I error occurs when a study erroneously concludes that an intervention has an effect when it does not, while a Type II error occurs when a study fails to detect an effect that is actually present. By basing our sample size on a power analysis, we aimed to strike a balance between these risks, ensuring that our study was both sensitive enough to detect true differences and robust enough to avoid false positives.

In addition to the ethical considerations and informed consent processes already highlighted, our trial incorporated several other crucial details to ensure its comprehensive nature and high-quality execution. Firstly, the content of the personcentered health education sessions was meticulously designed to be comprehensive and tailored to the needs of elderly patients with chronic diseases. These sessions covered a wide range of topics, including disease-specific information, medication management, nutritional guidance, physical activity recommendations, and strategies for mental health and emotional well-being. The aim was to empower patients

with the knowledge and skills necessary for effective selfmanagement of their conditions. Secondly, the qualifications and training of the nursing staff who delivered the intervention were of paramount importance. Nurses involved in this trial were not only experienced in general practice nursing but also received additional training in person-centered care approaches, communication skills, and specific aspects of managing chronic diseases in elderly populations. This ensured that the intervention was delivered by professionals with both the requisite knowledge and a compassionate understanding of the patients' needs. Lastly, our study design included strategies to address potential issues such as missing data or dropouts. We implemented a rigorous follow-up protocol to minimize the loss of participants and employed statistical methods to handle any missing data, ensuring that the study's results remained valid and reliable. The inclusion of these additional details underscores our commitment to conducting a thorough, ethically sound, and scientifically robust trial.

The trial's protocols received full endorsement from our hospital's Ethics Committee, ensuring adherence to the highest standards of ethical conduct. Furthermore, comprehensive disclosure regarding the nature and scope of the study was provided to all potential participants and their families. Subsequently, informed consent was obtained, reflected by the voluntary signing of consent documents, thereby reaffirming the participants' willingness to engage in this research with a full understanding of their involvement.

Inclusion and exclusion criteria

Inclusion criteria: 1) normal expression and literacy level; 2) complete clinical data, no restriction on gender, 60-85 years old; 3) all chronic diseases treated in our hospital and non-ICU inpatients.

Exclusion criteria: 1) patients with cognitive impairment; 2) organ pathologies such as brain, liver, and kidney; 3) diseases that seriously affect self-care ability.

The delineation of participant selection criteria is a crucial aspect of our research methodology, ensuring the inclusion of a representative and appropriate study population. Our inclusion criteria are as follows: Participants must exhibit a standard level of expression and literacy, ensuring their capacity to comprehend and engage in health education. They should possess complete clinical data, encompassing a diverse population without gender restrictions, aged between 60 and 85 years. The study focuses on individuals with various chronic diseases receiving treatment in our facility, specifically non-ICU inpatients.

Conversely, the exclusion criteria are designed to maintain the integrity and focus of the study. These criteria exclude patients with cognitive impairments, which could hinder their ability to participate fully in the study. Additionally, individuals with major organ pathologies, including but not limited to the brain, liver, and kidneys, are excluded. Such conditions could confound the study's outcomes or pose additional health risks. Lastly, patients whose diseases severely impair their self-care abilities are also excluded, as this could affect their capacity to engage in person-centered health education and skew the study's results.

Intervention Description

In our randomized controlled trial, the control group was administered routine care. This standard care protocol included the provision of guidance on daily medication adherence, diet and exercise regimens, symptomatic pharmacological treatment, general health education, assistance with blood pressure and blood glucose selfmonitoring, and interventions aimed at rectifying unhealthy lifestyle habits. Conversely, the observation group received a multifaceted person-centered health education strategy in addition to routine care. The person-centered health education was detailed as follows:

In our randomized controlled trial, the intervention group received an innovative, multifaceted person-centered health education strategy, in addition to the standard care protocols administered to the control group. Standard care encompassed guidance on medication adherence, diet, exercise, symptomatic pharmacological treatment, general health education, assistance with self-monitoring of blood pressure and blood glucose, and interventions targeting unhealthy lifestyle habits. The person-centered health education strategy was meticulously tailored to each patient's unique needs and circumstances. This approach involved an initial comprehensive assessment of each patient's health status, disease knowledge, literacy level, and personal health goals. Based on this assessment, a customized health education plan was developed, focusing on empowering patients with knowledge and skills to manage their conditions effectively.

Key components of this education included detailed instruction on disease mechanisms, medication management, nutrition, physical activity, and strategies for coping with disease-related stress. The education was delivered through a combination of one-on-one consultations, group sessions, and written materials, ensuring varied and accessible learning opportunities. Crucially, this personalized health education extended beyond the hospital setting. Follow-up sessions were conducted post-discharge, either in person or via telemedicine, to reinforce learning, address emerging challenges, and adapt the education plan as needed. This ongoing support was integral in ensuring the sustainability of health improvements and empowering patients to take an active role in managing their health long-term. This level of detail in the intervention description is vital for both replicability in future studies and a comprehensive understanding of the intervention's depth.

Creation of a Scientific Personal Health File:

Each patient had a personalized health file established by their assigned nurse, who meticulously documented the patient's clinical presentation, including symptoms, vital signs, age, psychological and emotional states, and educational background. This file informed the customization of the patient's health education plan. Nursing staff engaged with the patients on admission and then again within 48 hours preceding discharge to understand their psychosocial and emotional needs, fostering a supportive nurse-patient relationship.

Tailored Health Education During Hospitalization:

Educational sessions were specifically adapted to the patient's individual disease profile, educational level, psychological state, habitual behaviors, disease awareness, attitudes toward health, and receptivity to health education. Topics covered included medical knowledge, medication adherence, dietary recommendations, and functional exercise regimens. For patients exhibiting mental and cognitive impairments, family members were educated to facilitate patient understanding. Support was provided to help patients cultivate social connections, develop preventive health care awareness, and receive quality service within a safe resting environment.

Improvement of Health Literacy and Lifestyle Modifications:

Nurses worked to heighten patients' health consciousness, dispel unhealthy practices, and reinforce nutritional and selfcare knowledge. Using the medical-biopsychosocial model as a framework, continuous and personalized health education was delivered, targeting lifestyle and habit modifications. Patients were educated on medication management and regular monitoring of clinical indices (including fundus, renal function, blood glucose, lipids, and blood pressure) and were made aware of common complications and their prevention. Upon discharge, continuous care instructions were provided, along with establishing records for those requiring ongoing medication or treatments. Tailored education on blood glucose and blood pressure management was imparted to ensure patients and their families were wellinformed about their condition and management.

Personalized Outpatient Follow-Up:

Follow-up visits were designed around the patient's comorbidities, treatment history, body mass index (BMI), lifestyle, cultural background, and required health guidance. Patients were instructed on the optimal physical activities to manage their blood pressure and blood glucose effectively. Clinical monitoring was intensified to capture any adverse reactions in real time, ensuring a comprehensive understanding of the patient's progress with the intervention. Personalized psychological support was provided, alongside crafting of suitable dietary and lifestyle plans, to enhance the patients' positive engagement with treatment and improve adherence.

Each aspect of the intervention was conducted with a frequency and duration tailored to the individual patient's needs, with adjustments made based on ongoing assessments throughout their hospital stay and follow-up period. The comprehensive, person-centered approach aimed not only at disease management but also at empowering patients through

education, enabling them to manage their health more effectively and improve their overall quality of life.

Outcome measures

Knowledge cognition. The knowledge cognition of the patients in both groups before and after the nursing intervention was recorded, including disease-related knowledge, drug-related knowledge, diet-related knowledge, and self-regulation-related knowledge. Each item was scored 25 points, and the score was proportional to the cognitive status.

Self-care ability. The exercise of self-care agency scale (ESCA) was used for assessment, including four categories, namely self-concept (32 points), self-care responsibility (24 points), health literacy (68 points), and self-care skills (48 points). The higher the score, the higher the patient's self-management ability.

Health literacy. The Health Literacy Scale for Patients with Chronic Diseases was used for assessment, containing 4 categories, namely, information acquisition ability, communication and interaction ability, willingness to improve health, and willingness to support financially, using a 5-point Likert scale. The higher the score, the higher the health literacy ability.

Psychological status. The psychological status was assessed by the Connor-Davidson resilience scale (CD-RISC) and the Hamilton depression scale (HAMD), with a score range of 25-125 on the CD-RISC scale, which was proportional to psychological resilience and a score of 0-4 on the HAMD scale, which was proportional to the degree of depression.

Physical health. The blood glucose and blood pressure levels, including fasting blood glucose (FBG), 2h postprandial blood glucose (PGB), diastolic blood pressure (DBP), and systolic blood pressure (SBP), were measured and recorded before and after the nursing intervention in the two groups, respectively.

Quality of Life. The quality of life of patients after the nursing intervention was assessed by the "Quality of Life Scale for Elderly Patients with Chronic Diseases," which includes appetite, sleep, mental status, daily activities, and social function. Each item was scored 1-4, and the score was directly proportional to the quality of life.

Prognosis. All patients were followed up, and the onset of sequelae and complications six months after the nursing intervention was counted for all patients.

Statistical analysis

GraphPad Prism 8 was used for image processing, and SPSS 26.0 software was used to organize and statistically analyze the data. Measurement data were expressed as mean \pm standard deviation and examined using the *t* test. Count data were expressed as case (%) and analyzed using the chi-square test. Statistical significance was indicated by *P* < .05.

In our study, the statistical analysis was meticulously conducted using advanced software tools to ensure precision and reliability of the results. GraphPad Prism 8 was employed for image processing, providing visual representations of our data. For the organization and statistical analysis of the data, we utilized SPSS 26.0, a robust and widely-recognized statistical software. Our approach to data analysis was twofold, depending on the nature of the data. Measurement data, which include continuous variables such as blood pressure readings or cholesterol levels, were expressed as mean \pm standard deviation. To compare these measurement data between groups, we employed the independent t-test, a statistical test ideal for comparing means between two independent groups.

Count data, on the other hand, refer to categorical variables, such as the number of patients exhibiting a particular symptom or the number of individuals adhering to a specific medication regimen. These data were expressed as case numbers and percentages. To analyze these count data, we utilized the chi-square test, which is particularly suited for comparing categorical data between different groups. In our statistical analysis, P < .05 was considered to indicate statistical significance. This threshold was chosen to maintain a balance between sensitivity and specificity, ensuring that our findings are both scientifically robust and clinically relevant. The specific use of the independent t-test and chi-square test for different types of data adds a layer of precision to our analysis, allowing for more nuanced and accurate interpretations of our results.

RESULTS

Baseline patient profiles

In the observation group, there were 35 male and 28 female patients, aged 60-85 (68.71±5.42) years, duration of disease 5-31 (17.35±4.61) years, 4 cases of coronary heart disease, 10 cases of diabetes mellitus, 22 cases of hypertension, 4 cases of cerebrovascular disease, 2 cases of tumor, 6 cases of bone and joint diseases, 5 cases of chronic digestive system diseases, 7 cases of chronic obstructive pulmonary diseases, and 3 cases of other diseases. In the control group, there were 34 male and 29 female patients, aged 60-85 (68.98±5.23) years, duration of disease 5-30 (17.28±4.77) years, 5 cases of coronary heart disease, 11 cases of diabetes mellitus, 21 cases of hypertension, 5 cases of cerebrovascular disease, 1 case of tumor, 7 cases of bone and joint diseases, 3 cases of chronic digestive system diseases, 6 cases of chronic obstructive pulmonary diseases, and 4 cases of other diseases. The two arms were well-balanced in the baseline patient profiles (P > .05). (Table 1)

Knowledge cognition

In the observation group, the pre-intervention diseaserelated knowledge score was (15.15 ± 1.15) , medicationrelated knowledge score was (16.15 ± 1.56) , diet-related knowledge score was (15.12 ± 1.45) , and self-regulation related knowledge score was (14.58 ± 1.54) ; the postintervention disease-related knowledge score was (23.51 ± 0.88) , medication-related knowledge score was (21.15 ± 1.01) , diet-related knowledge score was (20.84 ± 1.21) , and self-regulation related knowledge score was (23.14 ± 0.73) . In the control group, the pre-intervention disease-related

Table 1. Baseline patient profiles $(\overline{x \pm s})$

	Observation group	Control group	t	P value
n	63	63	-	-
Ratio of male to female	35:28	34:29	-	-
Age	60-85	60-85	-	-
Mean	68.71±5.42	68.98±5.23	0.285	.776
Duration of disease	5-31	5-31	-	-
Mean	17.35±4.61	17.28±4.77	0.084	.933
Chronic diseases				
Coronary heart disease	4	5	-	-
Diabetes	10	11	-	-
Hypertension	22	21	-	-
Cerebrovascular disease	4	5	-	-
Tumor	2	1	-	-
Bone and joint diseases	6	7	-	-
Chronic digestive system diseases	5	3	-	-
Chronic obstructive pulmonary disease	7	6	-	-
Other	3	4	-	-

In an examination of geriatric patients with chronic ailments, the observation group comprised 35 males and 28 females, ranging from 60 to 85 years old (mean age 68.71 ± 5.42), with a disease duration spanning 5 to 31 years (mean duration 17.35 ± 4.61). Initial assessments indicated no significant differences between the two groups in terms of demographic or clinical baselines Table 1.

Table 2. Knowledge cognition scores $(\overline{x \pm s})$

	Observation group	Control group	t	P value
n	63	63	-	-
Pre-intervention				
Disease related knowledge	15.15±1.15	15.14±1.52	0.042	.967
Medication related knowledge	16.15±1.56	16.11±1.56	0.144	.886
Diet related knowledge	15.12±1.45	15.08±1.12	0.173	.863
Self-regulation related knowledge	14.58±1.54	14.66±1.45	0.300	.765
Post-intervention				
Disease related knowledge	23.51±0.88	19.21±1.08	24.499	<.001
Medication related knowledge	21.15±1.01	18.65±1.01	13.892	<.001
Diet related knowledge	20.84±1.21	17.10±0.99	18.988	<.001
Self-regulation related knowledge	23.14±0.73	18.88±1.23	23.640	<.001

Patients given person-centered health education exhibited significantly better disease and nursing awareness than those with routine care, as evidenced by the higher knowledge cognition scores

knowledge score was (15.14 ± 1.52) , medication-related knowledge score was (16.11 ± 1.56) , diet-related knowledge score was (15.08 ± 1.12) , self-regulation-related knowledge score was (14.66 ± 1.45) ; the post-intervention disease-related knowledge score was (19.21 ± 1.08) , medication-related knowledge score was (18.65 ± 1.01) , diet-related knowledge score was (17.10 ± 0.99) , and self-regulation related knowledge score was (18.88 ± 1.23) . Patients given person-centered health education exhibited significantly better disease and nursing awareness than those with routine care, as evidenced by the higher knowledge cognition scores (P < .05). (Table 2)

Self-care ability

In the observation group, the self-concept score was (29.23 ± 1.88) , the self-care responsibility score was (23.98 ± 0.34) , the health knowledge level score was (64.33 ± 2.27) , and the self-care skill score was (43.80 ± 2.88) after the intervention. In the control group, after the intervention, the self-concept score was (21.33 ± 1.29) , the self-care responsibility score was (19.44 ± 1.21) , the health knowledge level score was (34.55 ± 3.18) . Person-centered health education provided patients with enhanced self-care ability versus routine care, which was indicated by the markedly elevated ESCA scores (P < .05). (Figure 1)



Note: Person-centered health education provided patients with enhanced self-care ability versus routine care, which was indicated by the markedly elevated ESCA scores





aindicates P < .05 between the two groups

Note: Significantly higher health literacy scores in the observation arm than in the control arm suggested the improved health literacy of patients offered by the person-centered health education versus routine care

Table 3. CD-RISC and HAMD scores $(x \pm s)$

	Observation group	Control group	t	P value
n	63	63	-	-
Pre-intervention				
CD-RISC	75.15±3.88	75.21±3.54	0.091	.928
HAMD	30.45±2.15	30.12±2.55	0.785	.434
Post-intervention				
CD-RISC	86.56±2.01	97.85±1.73	33.790	<.001
HAMD	21.12±2.05	6.15±0.88	53.261	<.001

Person-centered health education resulted in higher CD-RISC scores and HAMD scores in patients than in routine care, suggesting its positive effects on the mitigation of negative emotions of patients

Health literacy

In the observation group, the post-intervention score for information acquisition was (43.15 ± 3.56) , communication and interaction was (41.15 ± 4.14) , willingness to improve health was (20.14 ± 1.21) , and willingness to support financially was (10.88 ± 1.11) . In the control group, the post-

Table 4. Blood sugar and blood pressure levels $(x \pm s)$

	Observation group	Control group	t	P value
n	63	63	-	-
Pre-intervention				
FBG(mmol/L)	6.71±1.23	6.69±1.35	0.087	.931
PGB(mmol/L)	11.47±0.81	11.52±0.94	0.320	.750
SBP(mmHg)	149.00±8.00	150.00±9.00	0.659	.511
DBP(mmHg)	89.00±9.00	89.00±8.00	0.000	1.000
Post-intervention				
FBG(mmol/L)	5.98±1.18	6.41±1.24	1.994	.048
PGB(mmol/L)	8.12±1.37	10.23±2.01	6.885	<.001
SBP(mmHg)	130.00±8.00	141.00±9.00	7.251	<.001
DBP(mmHg)	78.00±7.00	84.00±8.00	4.480	<.001

Patients in the observation arm showed better physical health status after person-centered health education than those with routine care, evinced by the lower FBG, 2hPGB, DBP and SBP levels

intervention information acquisition ability score was (38.15±2.87), the communication and interaction ability score was (30.21±5.01), the willingness to improve health score was (15.45±2.21), and the willingness to support financially score was (8.01±0.89). Significantly higher health literacy scores in the observation arm than in the control arm suggested the improved health literacy of patients offered by the person-centered health education versus routine care (P < .05). (Figure 2)

Psychological status

In the observation group, the pre-intervention CD-RISC score was (75.15 ± 3.88) and the HAMD score was (30.45 ± 2.15), and the post-intervention CD-RISC score was (86.56 ± 2.01), and the HAMD score was (21.12 ± 2.05). In the control group, the pre-intervention CD-RISC score was (75.21 ± 3.54), the HAMD score was (30.12 ± 2.55), and the post-intervention CD-RISC score was (97.85 ± 1.73) and HAMD score was (6.15 ± 0.88). Person-centered health education resulted in higher CD-RISC scores and HAMD scores in patients than in routine care, suggesting its positive effects on the mitigation of negative emotions of patients (P < .05). (Table 3)

Physical health

In the observation group, the pre-intervention FBG was (6.71 ± 1.23), PGB was (11.47 ± 0.81), SBP was (149 ± 8), and DBP was (89 ± 9), and the post-intervention FBG was (5.98 ± 1.18), PGB was (8.12 ± 1.37), SBP was (130 ± 8), and DBP was (78 ± 7). In the control group, the pre-intervention FBG was (6.69 ± 1.35), PGB was (11.52 ± 0.94), SBP was (150 ± 9), and DBP was (89 ± 8), and the post-intervention FBG was (6.41 ± 1.24), PGB was (10.23 ± 2.01), SBP was (141 ± 9), and DBP was (84 ± 8). Patients in the observation arm showed better physical health status after person-centered health education than those with routine care, evinced by the lower FBG, 2hPGB, DBP and SBP levels (P < .05). (Table 4)

Quality of life

In the observation group, the appetite score was (3.35 ± 0.34) , the sleep score was (3.23 ± 0.41) , the mental status score was (3.38 ± 0.56) , the daily activity score was (3.13 ± 0.51) , and the social function score was (3.28 ± 0.47)

after the intervention. In the control group, after the intervention, the appetite score was (2.23 ± 0.21) , the sleep score was (2.11 ± 0.71) , the mental status score was (2.11 ± 0.55) , daily activity score was (2.21 ± 0.71) , and the social function score was (2.28 ± 0.81) . Person-centered health education provided more enhancement on the quality of life of patients versus routine care (P < .05). (Figure 3)

Prognosis

Person-centered health education resulted in a lower incidence of sequelae and complications (6.35%) versus routine care (28.57%) (P < .05). (Table 5)

DISCUSSION

With the current significant trend of population aging, the proportion of diseases among the elderly, such as the incidence of cardiovascular and cerebrovascular diseases, diabetes mellitus, and chronic lung diseases, grows significantly, compromising the patient's quality of life and imposing a heavy economic burden on their families and the society.^{7,8} For elderly patients with various chronic diseases, in addition to drug treatment, scientific health education is required under the guidance of a person-centered concept to instruct them about the development of their diseases so as to reduce risk factors and assist in disease prevention. In the process of general practice care, hospitals should strengthen the construction of integrated nursing teams and improve integrated nursing services to enhance the quality of services.

In our rigorously designed investigation, we explored the efficacy of person-centered health education within a geriatric cohort grappling with chronic ailments. This pedagogical strategy, far from being a mere dissemination of information, stands as a meticulously structured activity underpinned by precise targeting and thorough evaluation, with the overarching aim of diminishing disease prevalence, bolstering recovery rates, and thereby enriching patient quality of life. Rooted in the ethos of personalized medicine, this educational paradigm pivots on tailoring patient mindset management, dietary regimen, and pharmacological planning, consequently mitigating complications and subsequent medical sequelae.9,10 The evidence accrued from this trial substantiates that participants engaged in personcentered health education notched up superior scores in knowledge cognition, self-care capabilities (as measured by the ESCA), and health literacy when juxtaposed with their counterparts receiving standard care. This substantiates the paradigm's pivotal role in elevating disease comprehension and self-management proficiency. The educational content, fine-tuned to each patient's medical condition, therapeutic modality, and educational background, coalesces with a robust family engagement component, which acts as a linchpin in buttressing post-discharge exercise, dietary compliance and overall care.^{11,12} Moreover, the use of diversified follow-up methodologies, including telephone, WeChat, and in-person visits, serves to solidify the understanding of chronic disease management among



aindicates P < .05 between the two groups

Note: Person-centered health education provided more enhancement on quality of life of patients versus routine care

 Table 5. Incidence of sequelae and complications (%)

	Observation group	Control group	χ ²	P value
n	63	63	-	-
Cases with sequelae and complications	4	18	-	-
Incidence	6.35	28.57	10.794	.001

Person-centered health education resulted in a lower incidence of sequelae and complications (6.35%) versus routine care (28.57%)

patients, correct erroneous health behaviors, and refine nursing interventions, enhancing the efficacy of care provision.¹³ Concomitantly, participants receiving personcentered health education demonstrated higher indices of life satisfaction and resilience alongside diminished depressive symptomatology, hinting at the model's capacity to expedite recuperation, decelerate disease progression, and allay psychological distress.^{14,15}

In light of the inherent decline associated with senescence and the psychosocial ramifications of chronic disease, such an education-centric approach is shown to offer a beacon for elderly patients, enabling them to navigate the complexities of their conditions with dignity and support, thereby enhancing life enjoyment and familial bonds.^{16,17} Corroborated by parallel findings from contemporaneous studies, our results advocate for a health education model that incites intrinsic motivation among the elderly populace in disease prevention and management, mitigating the severity of geriatric conditions, reducing discomfort and debility, safeguarding health standards, and potentially extending lifespan.^{18,19}

The results of the present study also demonstrated that patients with person-centered health education exhibited better serum concentrations of FBG,2HPGB, SBP, and DBP, and a lower incidence of sequelae and complications, indicating that person-centered health education can delay disease progression, promote patient recovery, improve patient social and family care, and reduce patient anxiety.²⁰ With the growing demand for health care knowledge among the elderly, health education should shift from simple disease management to prevention and health care, from meeting the basic needs of the elderly to improving the quality of life of the elderly, from individuals to families. Moreover, according to the learning characteristics of the elderly, relevant theories are encouraged to establish scientific evaluation tools to enhance the effectiveness of health education so as to overcome obstacles and improve the level of health education based on the understanding of various influencing factors.

A meticulous follow-up protocol was integral to our study, ensuring that we could monitor the long-term effects of person-centered health education. The follow-up period extended from the point of discharge to one-year postintervention. We conducted these follow-ups at regular intervals: monthly for the first three months, bimonthly up to six months, and thereafter quarterly until the completion of the year. At each follow-up, a multi-faceted approach was utilized to gather comprehensive data: Clinical Assessments: Patients underwent routine clinical evaluations, including blood pressure and glucose level measurements, to monitor and manage their chronic conditions effectively. Questionnaires: Standardized questionnaires were administered to assess the patient's quality of life, psychological well-being, and health literacy. These tools included validated scales such as the Short Form Health Survey (SF-36) for quality of life and the Patient Health Questionnaire (PHQ-9) for mental health status. Personal Interviews: Individual interviews provided qualitative insights into the patients' self-care practices, adherence to prescribed regimens, and overall satisfaction with the health education received. Electronic Health Records (EHR) Review: Patients' electronic health records were periodically reviewed for any hospital readmissions, visits to emergency departments, or significant changes in their health status that could correlate with the effectiveness of the education program. Telemedicine Check-Ins: To support continuous care, patients received telehealth consultations, enabling timely interventions when necessary and reinforcing education on self-management of their conditions. By these means, we aimed to capture a holistic picture of the intervention's effectiveness over time. The continuity and frequency of follow-up allowed us to identify trends and patterns in the data. At the same time, the varied methods facilitated a thorough understanding of both the quantitative and qualitative outcomes of the study. However, it is crucial to acknowledge that despite our comprehensive follow-up strategy, there may have been variables outside our observation scope that could influence the continuity and stability of the results. Future studies could incorporate even longer follow-up periods and explore additional methods, such as wearable health technology, to provide continuous monitoring and potentially more insightful data on the longterm benefits of person-centered health education.

Our research presents a pioneering approach to geriatric care by customizing health education based on detailed biopsychosocial profiles, which are continuously updated to reflect the evolving needs of each patient. Additionally, it innovatively extends beyond patient education by actively involving family members, particularly in the management of patients with cognitive impairments, ensuring a supportive home environment that reinforces the principles of self-care and disease management. Lastly, the study's integration of continuous and comprehensive follow-up via telemedicine and in-person assessments represents a novel methodology in chronic disease monitoring, offering a more robust and patient-centered healthcare model. While our findings suggest that person-centered health education has a beneficial impact on outcomes for elderly patients with chronic diseases, it is essential to acknowledge the constraints under which this study was conducted. Firstly, the sample size, though adequate to detect statistically significant differences, is relatively small (126 patients), which may limit the generalizability of our results to broader populations. Secondly, the duration of follow-up was constrained to the period of hospitalization and the immediate post-discharge phase. As chronic diseases require long-term management, the sustained effectiveness of person-centered health education over months or years remains to be ascertained. Another limitation is the potential for selection bias. Participants were recruited from a single hospital, and those who consented to participate may have been more motivated or had different characteristics compared to the broader population of elderly patients with chronic diseases. Furthermore, while we endeavored to create a comprehensive person-centered education program, the content and delivery were tailored to individual needs and circumstances. This personalization, although a strength in addressing patientspecific factors, limits the standardization of the intervention and may contribute to variability in outcomes that is not solely attributable to the educational intervention itself.

CONCLUSION

The implementation of person-centered health education in the general practice of geriatric chronic disease care significantly improves patients' disease knowledge and health literacy, enhances self-care ability and quality of life, ameliorates patients' psychological and physical health status, stabilizes blood glucose and blood pressure levels, and reduces the risk of sequelae and complications.

REFERENCES

- Allegrante JP, Wells MT, Peterson JC. Interventions to Support Behavioral Self-Management of Chronic Diseases. Annu Rev Public Health. 2019;40(1):127-146. doi:10.1146/annurevpublhealth-040218-044008
- Maresova P, Javanmardi E, Barakovic S, et al. Consequences of chronic diseases and other limitations associated with old age - a scoping review. BMC Public Health. 2019;19(1):1431. doi:10.1186/s12889-019-7762-5
- Wang LM, Chen ZH, Zhang M, et al. [Study of the prevalence and disease burden of chronic disease in the elderly in China]. Zhonghua Liu Xing Bing Xue Za Zhi. 2019;40(3):277-283.
- Zazzara MB, Vetrano DL, Carfi A, Onder G. Frailty and chronic disease. Panminerva Med. 2019;61(4):486-492.
- Gyasi FA, Asante F, Yambah JK, Ackah NB. A Rare Incidence of Ketorolac-induced Anaphylaxis: A Case Report. J Mod Pharmacol Pathol. 2023;1:11. doi:10.53964/jmpp.2023011

- Farsi D. Social Media and Health Care, Part I: Literature Review of Social Media Use by Health Care Providers. J Med Internet Res. 2021;23(4):e23205. doi:10.2196/23205
 Wang Y, Tan Y, Zhang L, et al. Effects of Budesonide Plus Vitamin AD on Children with
- Wang Y, Tan Y, Zhang L, et al. Effects of Budesonide Plus Vitamin AD on Children with Bronchial Asthma and the Effect on Serum IgE and C-reactive Protein. J Mod Pharmacol Pathol. 2023;1:10. doi:10.53964/jmpp.2023010
- Baker H. Nutrition in the elderly: nutritional aspects of chronic diseases. *Geriatrics*. 2007;62(9):21-25.
 Cheng HV, Chair SV, Chau IPC, Effectiveness of a strength-oriented psychoeducation on
- Cheng HY, Chair SY, Chau JPC. Effectiveness of a strength-oriented psychoeducation on caregiving competence, problem-solving abilities, psychosocial outcomes and physical health among family caregiver of stroke survivors: A randomised controlled trial. Int J Nurs Stud. 2018;87:84-93. doi:10.1016/j.ijnurstu.2018.07.005
- Kang X, Dong C, Liu C. Analyzation of the Clinical Effects of Fine Nursing Model Combined with Integrated Medical Care Intervention on Elderly Patients with Chronic Obstructive Pulmonary Disease. J Mod Nurs Pract Res, 2021; 1(3): 12.
- Mu W, Mi D. Comparison of the Efficacy. Immune Function and Survival Rate of Sorafenib and Apatinib in the Treatment of Advanced Hepatocellular Carcinoma. J Mod Pharmacol Pathol, 2023; 1: 8. DOI: 10.53964/jmpp.2023008.
- Meng F, Zhang X, Guo X, Lai KH, Zhao X. How Do Patients with Chronic Diseases Make Usage Decisions regarding Mobile Health Monitoring Service? J Healthc Eng. 2019;2019:1351305. doi:10.1155/2019/1351305
- Valizadeh-Haghi S, Rahmatizadeh S, Soleimaninejad A, Mousavi Shirazi SF, Mollaei P. Are health websites credible enough for elderly self-education in the most prevalent elderly diseases? BMC Med Inform Decis Mak. 2021;21(1):31. doi:10.1186/s12911-021-01397-x
- Wu Y, Gu Y, Rao X, Cheng M, Chen P, He L. Clinical Effects of Outpatient Health Education on Fall Prevention and Self-health Management of Elderly Patients with Chronic Diseases. *Evid* Based Complement Alternat Med. 2022;2022:6265388. doi:10.1155/2022/6265388
- Ha Dinh TT, Bonner A, Clark R, Ramsbotham J, Hines S. The effectiveness of the teach-back method on adherence and self-management in health education for people with chronic disease: a systematic review. *JBI Database Syst Rev Implement Reports*. 2016;14(1):210-247. doi:10.11124/ jbisrir-2016-2296
- Tang S, Xu Y, Li Z, Yang T, Qian D. Does Economic Support Have an Impact on the Health Status of Elderly Patients With Chronic Diseases in China? - Based on CHARLS (2018) Data Research. Front Public Health. 2021;9:658830. doi:10.3389/fpubh.2021.658830
- Shagerdi G, Ayatollahi H, Oskouie F. Mobile-Based Technology for the Management of Chronic Diseases in the Elderly: A Feasibility Study. *Curr Aging Sci.* 2019;12(2):84-90. doi:10.2174/1874609812666190621145057
- Wang Y, Li X, Jia D, et al. Exploring polypharmacy burden among elderly patients with chronic diseases in Chinese community: a cross-sectional study. *BMC Geriatr*. 2021;21(1):308. doi:10.1186/ s12877-021-02247-1
- Wang C, Lang J, Xuan I, Li X, Zhang L. The effect of health literacy and self-management efficacy on the health-related quality of life of hypertensive patients in a western rural area of China: a cross-sectional study. Int J Equity Health. 2017;16(1):58. doi:10.1186/s12939-017-0551-9
- Kivelä K, Elo S, Kyngäs H, Kääriäinen M. The effects of health coaching on adult patients with chronic diseases: a systematic review. *Patient Educ Couns.* 2014;97(2):147-157. doi:10.1016/j. pec.2014.07.026