

# *A study on health literacy improvement strategies of undergraduate nursing students supporting community health education model: an example of chronic disease management in Nanta community*

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**Keywords:** Undergraduate nursing students, chronic disease, health education, health literacy

**Abstract:** Through the investigation and interview of Nanta Street Health Service Center, and the telephone follow-up of elderly patients with hypertension and diabetes, to understand the current situation of chronic disease management and explore the community intervention strategy of undergraduate nursing students. In October 2021, the data of 200 elderly patients with hypertension and/or diabetes mellitus were randomly exported from the chronic disease management system of the center, and the staff of the center were also examined and interviewed. The elderly patients whose data were exported were telephonically followed up by the cut-off date of January 2022. According to their original diseases, they were divided into elderly hypertension group, elderly diabetes group, and elderly hypertension combined with diabetes group, and their data were counted and analyzed. Among the elderly patients with chronic diseases, 49 cases (72%) had normal blood pressure index and 19 cases (27.9%) had high blood pressure in the elderly hypertension group; 43 cases (72.8%) had normal blood glucose index and 16 cases (27.1%) had high blood glucose in the elderly diabetes group; 37 cases (67.2%) had normal blood pressure and blood glucose index and 18 cases (32.7%) had high blood pressure and/or high blood glucose in the elderly hypertension combined with diabetes group. The situation of chronic diseases accompanied by complications and activity abnormalities in the elderly was as follows: 9 cases (13.2%) of complications and 5 cases (7.3%) of activity abnormalities in the elderly hypertension group; 11 cases (18.6%) of complications and 10 cases (16.9%) of activity abnormalities in the elderly diabetes group; and 21 cases (38.1%) of complications and 15 cases (27.2%) of activity abnormalities in the elderly hypertension combined with diabetes group. Health management of key populations showed that the center filed 3,301 cases of elderly patients aged 65 years and older, and the rate of physical examination during the system year was 68.8%; the center managed 1,687 cases of hypertensive patients during the system year, and the standardized management rate was 77.83%; the center managed 651 cases of diabetic patients during the system year, and the standardized management rate was 80.03%. The management of hypertension and diabetes

in the community, health education and family visits need to be further improved. Undergraduate nursing students and other medical students can volunteer to serve in the management of chronic diseases in the community, provide diversified and multi-form health education, and establish a "family-community health service center-Tertiary general hospital" linkage network platform to provide a path to improve the management of chronic diseases in the community and to enhance the health literacy of the whole population.

## 1. Introduction

Hypertension and diabetes mellitus are common chronic, lifelong diseases, with many complications, easy to recur, long treatment period and difficult to cure. The risk of hypertension is significantly increased in hypertensive patients with abnormal glucose metabolism and in diabetic patients with hypertension<sup>[1]</sup>. This has become an important health issue that affects the health and quality of life of the middle-aged and elderly population. Community-based chronic disease management plays an important role in improving patients' health outcomes and quality of life<sup>[2]</sup>.

The number of deaths from chronic diseases in China has accounted for 87% of the total number of deaths in the country, and their disease burden accounts for 70% of the national disease burden<sup>[3]</sup>. Health literacy refers to the process by which people acquire, understand, and adopt health information and services, and use them to make correct judgments to promote their own health, and the level of health literacy directly affects the health outcomes of chronic diseases<sup>[4-5]</sup>.

This study aimed to understand the current management status of chronic disease patients and their health needs in the Nanta community, and to provide a pathway for undergraduate nursing students to support the management of chronic disease, health education and health literacy improvement in the community, through the examination of Nanta Street Health Service Center in Chenzhou City, China, interviews, and telephone follow-ups with elderly patients with hypertension and or diabetes mellitus.

## 2. Research Objects and Methods

### 2.1. Research subjects

From October 2021 to January 2022, 200 elderly hypertensive and or diabetic patients' data were randomly exported from the chronic disease management system of Nanta Street Community Health Service Center, identified as the study subjects, and followed up by telephone. Inclusion conditions: Hunan Province primary health system with elderly hypertension, diabetes mellitus files, archiving  $\geq 1$  year; general information, clinical data integrity of the person.

General information of enrolled patients: according to the original disease was divided into elderly hypertension group, elderly diabetes mellitus group, and elderly hypertension combined with diabetes mellitus group. Elderly hypertensive group (72 cases), male (35 cases), female (37 cases), average age ( $72.86 \pm 5.69$  years); Elderly diabetic group (67 cases), male (31 cases), female (36 cases), average age ( $73.26 \pm 6.71$  years); Elderly hypertension combined with diabetes group (61 cases), male (28 cases), female (33 cases), average age ( $73.08 \pm 6.65$  years). Exclusion criteria: those who could not be contacted/obtained information.

## 2.2 Research Methods

### 2.2.1 Telephone follow-up

Telephone follow-up of the enrolled elderly hypertensive and diabetic patients was conducted to record blood pressure/glucose control, medication taking/changing, complications, diet, exercise and other conditions. Excluding the 18 people whose phones were not connected/hung up/empty during the telephone follow-up, the actual number of the enrolled telephone follow-up was 182 people.

### 2.2.2 Interview method

The chronic disease management personnel of community health centers were interviewed to understand their work, the current status and problems of chronic disease management, and the health management statistics of key populations in Hunan Province's primary health system in 2021 were exported from the chronic disease management system.

### 2.2.3 Statistical methods

The data were statistically analyzed using SPSS 25.0 statistical software. Measurement data were described by "mean  $\pm$  standard deviation", and count data were expressed as rate (%).

## 3. Results

### 3.1 Blood pressure and or glucose control of elderly hypertensive and diabetic patients in Nanta Street

The results of telephone follow-up showed (see Table 1) that 49 cases (72%) of the elderly hypertensive group had normal blood pressure indicators and 19 cases (27.9%) had high blood pressure; 43 cases (72.8%) of the elderly diabetic group had normal blood glucose indicators and 16 cases (27.1 %) had high blood glucose; 37 cases (67.2%) of the elderly hypertension combined with diabetic group had normal blood pressure and blood glucose, and 18 cases (32.7 %).

Table 1: Blood pressure/glucose control in elderly hypertensive and diabetic patients in Nanta Street

types of disease	N (cases)	Normal blood pressure/glucose indicators (cases/%)			High blood pressure and or blood glucose indicators (cases/%)		
		The medication remains the same	change medicine	Occasional dosing/discontinuation	The medication remains the same	change medicine	Occasional dosing/discontinuation
Elderly Hypertension	68	37(54.4)	7(10.3)	5(7.3)	10(14.7)	5(7.3)	4(5.8)
Diabetes mellitus	59	30(50.8)	8(13.5)	5(8.5)	7(11.8)	6(10.1)	3(5.1)
Hypertension combined with diabetes mellitus in the elderly	55	29(53)	6(10.9)	2(3.6)	11(20.0)	4(7.2)	3(5.4)

### 3.2 Complications Accompanying and Activity Abnormalities in Elderly Hypertensive and Diabetic Patients in Nanta Street

Table 2: Complications accompanying and activity abnormalities in elderly hypertensive and diabetic patients in Nanta Street

types of disease	N (cases)	Hypertension, diabetes complications (cases/%)				Abnormal activity (cases/%)		
		Dizziness	blurred vision	Excessive drinking/urination	Weakness/swelling/ulceration of hands and feet	Walking time $\geq$ 10 minutes	stair	stay in bed
Elderly Hypertension	68	6(8.8)	3(4.4)	0	0	2(2.9)	1(1.5)	2(2.9)
Diabetes mellitus	59	0	5(8.5)	3(5.0)	3(5.0)	5(16.9)	2(3.3)	3(5.0)
Hypertension combined with diabetes mellitus in the elderly	55	3(5.5)	6(10.9)	5(9.0)	7(12.7)	8(14.5)	4(7.2)	3(5.5)

The results of telephone follow-up showed (see Table 2) that there were 9 cases (13.2%) of complications and 5 cases (7.3%) of activity abnormalities in the elderly hypertensive group; 11 cases (18.6%) of complications and 10 cases (16.9%) of activity abnormalities in the elderly diabetic group; and 21 cases (38.1%) of complications in the elderly hypertension combined with diabetes group in terms of blood pressure/blood glucose, and 15 cases (27.2%) of activity abnormalities.

### 3.3 Statistics on health management data of key population groups in Nanta Street, Suxian District, Chenzhou City, 2021

The results of Hunan Province grassroots health system data statistics show (see Table 3), Nanta community health management of the elderly aged 65 years and older filed 3301 cases, the system year physical examination rate of 68.8%; hypertension patients health management system year management of 1687 cases, standardized management rate of 77.83%; diabetes patients health management system year management of 651 cases, standardized management rate of 80.03%.

Table 3: Summary of health management data statistics of key populations in Nanta Street, Suxian District, Chenzhou City, 2021

work unit	$\geq$ Health management for 65 year olds		Health management of hypertensive patients		Health management of diabetic patients	
	Number of files established	Systematic in-year medical examination rate (%)	Number of systems managed during the year	Normative management rate (%)	Number of systems managed during the year	Normative management rate (%)
Nanta Street Community Health Center	3301	68.8	1687	77.83	651	80.03

## 4. Discussion

Elderly people are a high prevalence group of hypertension and diabetes mellitus, and the incidence of hypertension and diabetes mellitus has risen significantly due to the aging trend that continues to intensify in China. Among them, hypertension combined with diabetes mellitus in the elderly, disease control is difficult, the prevention and treatment trend is serious, must further improve the prevention, treatment and control effect<sup>[6]</sup>.

E-health literacy refers to the ability to use electronic resources to obtain knowledge to maintain

and solve their own health problems, which can reflect the self-management ability of chronic disease patients<sup>[7]</sup>. However, the e-health literacy rate of elderly patients with chronic diseases in China is only 11.1%, and there are problems such as lack of ability to obtain disease information, poor Internet operation skills, and insufficient motivation for self-management, which seriously affects the enhancement of the self-management ability of elderly patients with chronic diseases<sup>[8]</sup>.

At present, community medical institutions (health service centers/street community health offices, etc.) have become the main sector of chronic disease management, through treatment, archiving, follow-up management, health education and other measures to control/intervene in diabetes, hypertension patients' blood pressure, blood glucose levels. 2021 Chenzhou City, Suxian District, Nanta Street, the focus of the health management of the population health data statistics show that (see Table 3), the Nanta community hypertensive patients The rate of standardized management in the year of health management system was 77.83%; the rate of standardized management in the year of health management system for diabetic patients was 80.03%. The results of this study also showed (see Table 1) that the blood pressure control rate of the elderly hypertensive group in Nanta Street Community Health Center in Chenzhou City was 72%, the blood glucose control rate of the elderly diabetic group was 72.8%, and the blood pressure/glucose control rate of the elderly hypertensive combined with diabetic group was 67.2%. It suggests that Nanta Street Community Health Service Center has achieved some success in the management and control of hypertension and diabetes. However, Nanta Street Community Health Service Center needs to continue to explore and improve the chronic disease management model to further improve the effect of blood pressure and blood glucose control in hypertensive and diabetic patients with the following ideas.

#### **4.1 Advocate undergraduate nursing students volunteer to serve community health service center chronic disease management**

Nanta Street Community Health Service Center staff, limited preparation, assumed the Nanta Street area of the management of residents' health records, health education, vaccination, 0-6 years old children's health management, maternal health management, health management of the elderly, health management of patients with chronic diseases, management of patients with severe mental disorders, tuberculosis patient health management, traditional Chinese medicine health management, infectious diseases and public health emergencies. The work content of the report and treatment of infectious diseases and public health emergencies, health and family planning supervision and coordination. During the COVID-19 epidemic, matters such as its vaccination were added. As a result, there was limited time and effort to manage elderly hypertensive and diabetic patients in chronic disease management, and home visits for key populations were limited. The results of this study showed (see Table 2) that there were 9 (13.2%) complications and 5 (7.3%) activity abnormalities in the elderly hypertensive group; 11 (18.6%) complications and 10 (16.9%) activity abnormalities in the elderly diabetic group; and 21 (38.1%) blood pressure/glucose complications and 15 (27.2%) activity abnormalities in the elderly hypertensive combined diabetic group. People with complications were in urgent need of home visits by community chronic disease managers to provide relevant medical care services and improve patients' quality of life. This provides a pathway for medical students, such as undergraduate nursing students, to support chronic disease management in the community.

#### **4.2 Encourage undergraduate nursing students to support the community to develop diverse and multiform community health education.**

Hypertension, diabetes mellitus patients need to adhere to long-term medication to control blood

pressure, blood glucose indicators, which requires a high degree of adherence to medication, routine health education can improve the patient's knowledge of the disease, but some patients with low compliance behavior, failed to comply with medication and diet, is not conducive to the control of blood pressure, blood glucose <sup>[9]</sup>. Dou Ying et al <sup>[10]</sup> through the development of recreational activities, self-management, sports activities and other diversified, multi-form health education, the implementation of individualized focus on the patient's mission, the use of WeChat and other platforms for daily interaction, to promote the standardization of patient treatment. It contributes to the improvement of their blood pressure and blood glucose control effects. The results of this study show (see Table 1): 9 cases (13.2%) in the elderly hypertensive group with normal/high blood pressure indicators and occasional taking/stopping of medication; 8 cases (13.5%) in the elderly diabetic group with normal/high blood glucose indicators and occasional taking/stopping of medication; and 5 cases (9.0%) in the elderly hypertensive combined with diabetic group with normal/high blood pressure/blood glucose and occasional taking/stopping of medication. It suggests that some patients with hypertension and diabetes need to standardize their home medication and require diverse and relevant forms of health education. Undergraduate nursing students, as a reserve of medical students, can use their professional knowledge Joint Community Nursing Apprenticeships will provide pathways and models to support community health education.

#### **4.3 Strengthen the construction of the linkage network platform of "family - community health service center—Top three general hospitals" to provide a path for community chronic disease management, emergency and critical care referral, and the improvement of e-health literacy of the whole people.**

In recent years, the state has introduced a number of measures to prevent and control chronic diseases, such as family doctor contracting service and "health-centered" comprehensive management of chronic diseases <sup>[11]</sup>. However, due to the busy workload of family doctors (including doctors of tertiary general hospitals), they can only focus on chronic disease patients for a certain period of time each year to provide relevant disease guidance. And the community hypertension, diabetes complication symptoms appear time is not uniform, family doctors or tertiary general hospital doctors linkage is not timely, cannot provide patients with health needs. The results of this study showed (see Table 2): 5 cases (7.3%) of complications leading to abnormal activity in the elderly hypertension group; 10 cases (16.9%) of complications leading to abnormal activity in the elderly diabetes group; and 15 cases (27.2%) of complications leading to abnormal activity in the elderly hypertension combined with diabetes group. It is suggested that hypertensive and diabetic patients need convenient and timely medical and nursing care services.

The Healthy China Initiative (2019-2030) <sup>[12]</sup> proposes to use Internet technology to accelerate geriatric health promotion activities in order to minimize barriers to medical care for patients with chronic diseases and improve the quality of life of the elderly. Although various family medical and nursing equipment emerge in an endless stream, convenient and economical network platform services may become an important way of community family medical and nursing services, and use the network platform to improve the services of "family doctor contract" and "family - community - Top three hospitals linkage". The hospital-community implementation of multidisciplinary collaborative medical and nursing interventions in the undergraduate nursing student-supported community model not only meets the multifaceted health needs of patients with chronic diseases, but also provides a pathway for the study of strategies to improve e-Health literacy for all by sharing a large number of clinical health education science articles and cases.

## 5. Conclusions

Under the backdrop of the COVID-19 pandemic and Internet+, it is imperative to further explore community-based management models for patients with chronic diseases, such as home visits and Health education model, In order to meet the multifaceted health needs of patients with chronic diseases and all residents. Undergraduate nursing students and other medical students can volunteer to serve in community chronic disease management, provide diversified and multi-form health education, and improve the community chronic disease management, health education model and health literacy improvement strategy by establishing a "family-community health service center-triple A general hospital" linkage network platform.

## Acknowledgements

Thanks to the following topics for funding: 2019 Chenzhou City Social Science Planning Project (Czsskl2019081). Research on the strategy to improve the health literacy of the whole population under the model of undergraduate nursing students' support for community health education.2023 Hunan Provincial Department of Education Outstanding Youth Project (23B0773), "Construction of cognitive weakness risk prediction model for elderly people in elderly care institutions and intervention Strategy Research. 2019 Xiangnan University Undergraduate Innovation and Entrepreneurship Training Program Project, Survey and Improvement of Home Nursing in Renmin Road and Nanta Road Communities in Chenzhou City.

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