Application of Multidisciplinary Teamwork in Medication Safety Guidance for Elderly Population with Chronic Diseases in Community

Mingzhu Yang[1], Xuefen Zhou[2], Qiao Ye[1], Linli Zhou[1], Xiaobin Liu[1], Yue Liu[1], Zhenjiao Su[1, *]

[1]Zhuhai People's Hospital (Zhuhai Hospital Affiliated with Jinan University), Zhuhai, China

[2]Health Center of Hongqi Town, Zhuhai, China

Email address:

741275036@qq.com (Mingzhu Yang), 1656238614@qq.com (Xuefen Zhou), 1162842080@qq.com (Qiao Ye),
550364087@qq.com (Linli Zhou), 526827262@qq.com (Xiaobin Liu), 106043182@qq.com (Yue Liu),
suzhenjiao7822057@126.com (Zhenjiao Su)

*Corresponding author

Abstract: [Objective] A randomized controlled trial was conducted to investigate a systematic intervention to improve medication safety among elderly people in the community. [Methods] 150 community elderly patients with chronic diseases were randomly selected and divided into intervention group and control group. In addition to conventional medication safety guidance methods, multidisciplinary team cooperation mode was added to the intervention group. After 2 months of intervention, the knowledge, belief and practice of elderly patients with chronic diseases in the two groups were compared and analyzed. [Results]After intervention, inter-group and intra-group comparison of the intervention results showed that the total scores of knowledge, attitude and behavior KAP of the elderly with chronic diseases in the intervention group were higher than those in the control group, with statistical significance (p < 0.05), and the overall drug safety of the elderly in the community increased from a low level (47.3%) before intervention to a high level (95.8%) after intervention.. [Conclusion] The overall level of medication safety of the elderly in the chronic disease clinic of a town health center in Zhuhai is low. The drug safety guidance program of multidisciplinary team cooperation can effectively improve the medication safety of the elderly with chronic diseases in the community, and has a wide popularization.

Keywords: Multidisciplinary Team, Chronic Disease, Old People Medication Safety

1. Introduction

The National Office for Aging of the National Health Commission issued Document No. 45 [2021] [1], which clearly proposes to strengthen drug use guarantee for the elderly, encourage medical institutions to carry out drug use monitoring for the elderly, and apply the results into the daily health management of the elderly, so as to improve the level of safe and rational drug use for the elderly. Drug safety refers to a comprehensive examination and evaluation of the patient's condition, constitution, gene, genetic history and drug composition, accurate selection of drugs suitable for the patient, clear dose, method, time and route of medication, and attention to drug contraindications, adverse reactions and interactions with other drugs during medication. Finally, the goal of safety, effectiveness, rationality and economy can be achieved [2]. The purpose of this study is to explore a systematic intervention program that can improve the medication safety of the elderly in the community, and verify its application effect through objective indicators, and to improve the medication safety of the elderly with chronic diseases in the community, reduce their family and social and economic burden, improve their quality of life, and promote the health of the elderly.

2. Research Objects and Methods

2.1. Research Object

The convenient sampling method was adopted to collect the data of the elderly in the community who received treatment in the chronic disease clinic with complete basic information during the period from June 2022 to August 2022 by using the health records information system of a town health center in Zhuhai City, and a total of 150 eligible people were selected as the research objects. The old people's health records were exported and numbered 1-150. Random numbers were generated by excel documents and divided into two groups by blind method.

Inclusion criteria: (1) Age ≥60 years old, community residence ≥1 year; (2) Diagnosed with at least one chronic disease by secondary or above hospitals; (4) One or more drugs should be used for intervention, and the duration of medication is not less than 12 months; (4) no cognitive impairment; (5) Voluntary participation and signed informed consent.

Exclusion criteria: (1) can not participate in the whole intervention; (2) Those who are participating in other research projects.

Exclusion and shedding criteria: (1) lost visitors; (2) Unwilling to continue to participate in the study; (3) Patients who need to be hospitalized due to physical reasons and have to interrupt the intervention; (4) Death.

2.2. Sample Size Estimation

According to kendall sample estimation method, the sample size of multivariate analysis is 10-20 times of the study analysis variables, and the invalid sample rate of 20% is considered at the same time. There are 3 independent variable items in this study, and the required sample size is calculated by 20 times. The minimum sample size is: 3*20*1.2=72. The subjects of this study were 150, which met the requirements of the study. Formula: $N=Z^2 \times (P \times (1-P))/E^2$, where N is the sample size; Z is the statistic, and when the confidence is 95%, Z=1.96; When the confidence is 90%, Z=1.64; E is the error value; P is the probability value.

2.3. Literature Research Method

Domestic literature search databases such as "CNKI, Wanfang Data, Weipu Chinese Journal", and search terms include "multidisciplinary team, medication safety, medication guidance, community, chronic diseases, the elderly", etc. Foreign language search "PubMed /Web of Science/ELSEVIER Science Direct/Wiley Online Library/Springer Link" and other databases, the search terms included "the elderly, chronic disease, safe medication, MDT", etc. Through this method, relevant materials were read to understand the domestic and foreign status quo of medication safety for elderly chronic disease population and strategies to improve medication safety, etc., and a medication safety guidance program assisted by multidisciplinary teams was constructed.

2.4. Questionnaire Survey Method

2.4.1. General Information

General data including gender, age, education level, history of drug use errors, etc. were made by referring to literature [3].

2.4.2. Questionnaire on Medication Safety Knowledge of Elderly Patients with Chronic Diseases

The contents include the basic knowledge of drugs, the characteristics and precautions of drug use in the elderly, drug side effects and countermeasures, drug use as prescribed by the doctor, drug quality identification and storage. The answers are set as "yes, no and uncertain", with 1 point for correct answers and 0 points for incorrect and uncertain answers. Finally, the scores for each item are added up to a total of 18 points. The higher the score, the better [4].

2.4.3. Chinese Version Improved Medication Belief Scale

The scale consisted of 10 items, and the score for each item was 1-5 points, with the lowest score being 10 points and the highest score being 50 points. The higher the score was, the stronger the belief in the necessity of taking medicine was, and the weaker the belief in concern was. The scale has good reliability and validity [5].

2.4.4. Medication Compliance Measurement Scale for Chronic Disease Patients

This study selected the medication compliance questionnaire for chronic disease patients compiled by Xu Weihua [6], which included 17 items in two parts, medication compliance behavior and compliance sexual health belief, with the lowest score of 17 and the highest score of 85. A higher score indicates better compliance. The scale has good reliability and validity.

2.5. Intervention Method

2.5.1. Intervention Methods of Experimental Group

The experimental group received routine chronic disease management services in the community, on the basis of medication safety guidance program intervention. The drug safety guidance program is based on the theory of knowledge and trust, and is carried out in a mode combining various forms of health education intervention, drug use review and behavioral intervention. Besides, it provides the services of answering questions at any time and regular follow-up guidance. The intervention time is 2 months, and the preliminary program is as follows:

(1) Distribution of health education materials. On the basis of consulting relevant materials [7-8] and combining the characteristics of the elderly themselves and their families in Zhuhai community, the research team consulted experts in the fields of pharmacy, medicine and nursing to compile the "Elderly medication safety and Health Education Manual", "Medication Note sheet" and "self-condition monitoring record sheet" and issued guidance to fill in.

(2) To carry out special lectures, invite doctors, pharmacists and nursing staff to carry out popular science lectures on

drug safety knowledge every week. The expression language is mainly easy to understand, avoid excessive use of professional terms, in the form of pictures, simulated food molds, images and animations, and avoid too much boring text narration. Each lecture lasts for about 30 minutes, a total of 8 times [9].

(3) Drug use review was carried out. Group discussion and example demonstration education were carried out for subjects with serious unsafe drug use behaviors and improper drug taking attitude. Each discussion lasted for about 30 minutes for 4 times.

(4) Give out a weekly cartridge. The researchers prepared the weekly cartridge in advance, divided the drug into seven days, and then divided it into four compartments, so that the elderly could take the drug at different times of the day.

(5) Issue a timed reminder. This study will purchase a timed reminder, which can set a timed alarm clock and record the audio of relatives. When the time is up, the elderly will be reminded to take medicine.

(6) Use the Internet to establish wechat groups to push relevant knowledge regularly and provide timely Q&A, telephone follow-up, face-to-face personalized guidance services, etc.

2.5.2. Control Group Intervention Method

The control group received conventional chronic disease management services in the community of Zhuhai, including medication guidance for elderly patients with chronic diseases in the community, but did not receive comprehensive health education and medication guidance.

2.5.3. Evaluation Index

Inter-group comparison: the two groups of patients had intervention for 2 months. The evaluation of medication safety knowledge, medication belief and medication compliance before and after intervention were compared between the two groups.

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2.7. Statistical Analysis

SPSS24.0 statistical software was used for data entry, sorting, statistical processing and analysis. The test level α value was set at 0.05, and all P values were bilateral probabilities. Measurement data were expressed as mean ± standard deviation (x±S), and counting data were expressed as frequency or rate. Comparison of data between the two groups: t test was used for measurement data conforming to normal distribution, and 2 test was used for disordered group counting data.

3. Result

A total of 150 subjects were selected before intervention in this study, including 75 in each of the two groups, and 6 were lost to follow-up during the study, including 2 in the intervention group and 4 in the control group. The sample loss to follow-up rate was 4%, and 144 cases were finally completed, including 73 in the intervention group and 71 in the control group. See Table 1 for the analysis of the specific reasons for the sample loss of follow-up, and Table 2 for the general information of the research object (n=144).

Table 1. Analysis table of reasons for sample loss of follow-up.

	Intervention group (n=2)	Control group (n=4)
death	1	1
Midway for became seriously ill in hospital	1	1
Lost to follow-up		2

Table 2. General data of the subjects (n=144).

project	group	Number of people	Composition ratio (%)
gender	Male	60	41.7
	female	84	58.3
age	Between 60 and 65 years old	39	27.1
	Between 66 and 75 years old	61	42.4
	> 75 years old	44	30.6
Degree of education	Primary school diploma or below	70	48.6
	Junior high school education	61	42.4
	High school education	10	6.9
	College degree	3	2.1
	University degree or above	0	0
Marital status	Married (Have a spouse)	100	69.4
	Widowed	42	29.2
	Divorce	2	1.4
	unmarried	0	0
Medical background	Pay your own way	10	6.9
	Medical insurance	110	76.4
	New rural cooperative medical care	22	15.3
	other	2	1.4

project	group	Number of people	Composition ratio (%)
Previous occupation	Manual labor	82	57.0
	Physical as well as mental work	52	36.1
	Mental work	10	6.9
Monthly income	<500 yuan	2	1.4
	Between 501 and 1000 yuan	6	4.2
	Between 1001 and 1500 yuan	14	9.7
	Between 1501 and 2000 yuan	24	16.7
	>2001 yuan	98	68.1
Type of medication	1-3 kinds	88	61.1
	4-6 kinds	45	31.3
	≥7 kinds	11	7.6
Duration of medication	≥1 year < 3 years	27	18.8
	≥3 years < 5 years	39	27.1
	≥5 years	78	54.2
Whether there was a mistake in taking medication	Never	27	18.8
	Occasionally	39	27.1
	often	78	54.2
Whether to take expired medication	yes	55	38.2
	no	89	61.8

The 2 test showed that there was no significant difference in gender, age, education level and marital status between the two groups, indicating that the baseline data of the intervention group and the control group were balanced and comparable. The average score of medication safety knowledge and practice of the elderly with chronic diseases in a community in Zhuhai was (72.40±21.17) points, including knowledge score (8.94±3.96) points, attitude score (20.71±6.82) points, behavior score (42.75±10.39) points, scoring rate = average score/total score *100%. < 60% is low level, ≥60% < 80% is medium level, and ≥80% is high level. Therefore, the drug knowledge (49.7%), attitude (41.4%), behavior (50.3%) and overall (47.3%) of the subjects in this study were at a low level. See Table 3.

Table 3. Total drug safety knowledge and practice scores before intervention (x±s, points).

	score (x±s)	Scoring rate (%)
knowledge (18 points)	8.94±3.96	49.7
attitude (50 points)	20.71±6.82	41.4
behavior (85 points)	42.75±10.39	50.3
KAPTotal score (153 points)	72.40±21.17	47.3

Comparison between groups: Comparison of drug safety knowledge and practice scores between the two groups before intervention. According to the results of T-test, there was no statistical significance in knowledge, attitude, behavior and total score of KAP of the elderly in the two groups before intervention ($p > 0.05$), indicating that baseline data of the two groups were balanced and comparable. See Table 4.

Table 4. Comparison of drug safety knowledge and practice scores between the two groups before intervention (x±s, points).

	Intervention group (n=73)	Control group (n=71)	t	p
knowledge	8.77±3.92	9.10±4.01	-0.499	0.618
attitude	19.43±2.52	21.99±11.12	-1.917	0.057
behavior	41.12±8.33	44.37±12.45	-1.846	0.067
KAPTotal score	73.01±20.56	71.79±21.78	0.346	0.730

Comparison between groups: After intervention, the score of knowledge and practice of medication safety was compared between two groups. According to the T-test results, there were statistically significant differences between the two groups of elderly in knowledge, attitude, behavior and total score of KAP on safe drug use after intervention ($p < 0.001$), and scores in all aspects of the intervention group were higher than those of the control group, as shown in Table 5.

Table 5. Comparison of drug safety knowledge and practice scores between the two groups after intervention (x±s, points).

	Intervention group (n=73)	Control group (n=71)	t	p
knowledge	13.12±4.33	10.05±1.23	5.752	0.000
attitude	34.52±3.68	23.19±6.03	13.652	0.000
behavior	68.76±12.64	48.46±12.78	9.583	0.000
KAPTotal score	113.47±9.48	78.21±17.20	15.290	0.000

Intra-group comparison: Comparison of drug safety knowledge and practice scores in control group before and after intervention. According to the T-test results, there was no statistical significance in the knowledge of medication, attitude,

behavior and KAP score of the elderly in the control group

before and after intervention (p > 0.05), as shown in Table 6.

Table 6. *Comparison of drug safety knowledge and practice scores before and after control group (n=71).*

	pre-intervention	post-intervention	t	p
knowledge	9.10±4.01	10.05±1.23	-1.911	0.058
attitude	21.99±11.12	23.19±6.03	-0.799	0.425
behavior	44.37±12.45	48.46±12.78	-1.932	0.055
KAPTotal score	71.79±21.78	78.21±17.20	-1.949	0.053

Intra-group comparison: Comparison of medication safety knowledge and practice scores in intervention group before and after intervention. The t test showed that there was statistical significance in the knowledge of medication, attitude, behavior and total score of KAP of the elderly in the intervention group 2 months after intervention and the score before intervention (p < 0.001). The scores in all aspects of the intervention group were higher than those before intervention, as shown in Table 7.

Table 7. *Scores of medication safety knowledge and practice before and after intervention group (n=73).*

	pre-intervention	post-intervention	t	p
knowledge	8.77±3.92	13.12±4.33	-6.363	0.000
attitude	19.43±2.52	34.52±3.68	-28.907	0.000
behavior	41.12±8.33	68.76±12.64	-15.600	0.000
KAPTotal score	73.01±20.56	113.47±9.48	-15.269	0.000

4. Discussion

In the 21st century, the world's population is aging at a faster pace. According to the 7th population census of China released in 2021, the population aged 65 or above reached 190 million, accounting for 13.5% of the total population [10]. The educational level of the elderly is generally low, the corresponding knowledge of drug safety is less, and the awareness of drug safety is weak [9, 11]. While unsafe drug use is the main factor leading to the elderly frailty, reducing the various factors of unsafe drug use in the elderly is an important strategy to improve the quality of life of the elderly, prevent and manage frailty [12-14], it is an important measure to reduce the burden of family and society. Through questionnaire survey and statistical analysis of data, this study found that the elderly with chronic diseases in a community of Zhuhai City had a low score on medication safety knowledge, indicating that there are unsafe factors in medication safety in this group, which may lead to adverse outcomes, and it is urgent to publicize and popularize the knowledge of safe medication. Multi-team management mode helps the elderly with chronic diseases to establish the correct concept of taking medicine and positive attitude to take medicine, improve medication compliance.

After 2 months of intervention, the intervention group established MDT group with multi-team cooperation to implement intervention measures, and the total scores of knowledge, attitude and behavior of the elderly with chronic diseases in the intervention group were improved, the difference was statistically significant (p < 0.001). The overall drug safety of the elderly in the community increased from the low level before intervention (47.3%) to the high level after intervention (95.8%), and the intervention measures had a significant effect. The multidisciplinary MDT team can greatly improve the overall level of patients' knowledge and

practice of safe medication by distributing health education materials, conducting special lectures, conducting medication review, distributing medicine containers and timing reminders, etc. It can be seen that this intervention mode has high application value, which is consistent with the research results of Zhao Huinan [4] and Xiang Guiping [15].

Based on the theory of knowledge and belief, the purpose of this study is to change the bad behavior of medication safety of the elderly with chronic diseases in the community, strengthen the belief of safe medication of the elderly with chronic diseases in the community and make up for their lack of knowledge. Community hospitals, as the first barrier for the safe use of drugs by the elderly with chronic diseases, hope to build more and better platforms for science popularization and supervision, truly let the community doctors, pharmacists and nurses become the family medical instructors of the elderly in the community, improve the quality of life of the elderly with chronic diseases in the community, and solve the medical problems of the elderly in the aging society. The shortcoming of this study is that the single-center study lacks population comparison in different regions, and the study time is insufficient. Subsequent studies should select multi-center study comparison, extend the study time, increase the study volume, and increase the data comparison of biochemical indicators.

5. Conclusions

To sum up, the medical care mode of multidisciplinary team cooperation can effectively improve the level of safe drug use of the elderly with chronic diseases in the community through the assessment of medication knowledge, medication attitude and medication behavior of the elderly by physicians, pharmacists and nurses, the development of multidisciplinary cooperation comprehensive intervention measures and personalized management combined with the characteristics

of the elderly with chronic diseases. The improvement of safe medication level in the elderly with chronic diseases will directly improve the therapeutic effect and reduce the degree of debilitation. In the context of increasing aging, this study can effectively guide community hospitals on how to improve medication compliance of the elderly with chronic diseases in terms of knowledge, trust and practice.

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