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|  **MINISTRY OF EDUCATION AND TRAINING** | **MINISTRY OF HEALTH** |

**HAI PHONG UNIVERSITY OF MEDICINE AND PHAMARCY**

**NGUYEN THI THUY HIEU**

**EFFECTIVENESS OF HYPERTENSION TREATMENT MANAGEMENT AT COMMUNE HEALTH STATIONS**

**APPLYING FAMILY MEDICINE PRINCIPLES**

**IN HAI PHONG**

**Specialization: PUBLIC HEALTH**

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**g dÉn: GS.TSKH. Vò ThÞ Minh Thôc**

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**ACADEMIC ADVISORS:**

1. **Assoc. Prof. NGUYEN VAN HUNG**
2. **Assoc. Prof. PHAM VAN HAN**
3. **ASSOC.PROF. NGUYỄN VĂN HÙNG**
4. **ASSOC.PROF. PHẠM VĂN HÁN**

**Reviewer 1:**

**Reviewer 2:**

**Reviewer 3:**

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2. **Nguyen Thi Thuy Hieu,** Nguyen Van Hung, Pham Van Han, Nguyen Thi Tham (2021), “Effectiveness of interventions to support commune health stations applying family medicine principles in the hypertension management in 2016 - 2018", *Journal of Preventive Medicine*, Volume 31, Issue 5-2021, pages 92-98.
3. **Nguyen Thi Thuy Hieu,** Nguyen Van Hung, Pham Van Han, Nguyen Thi Tham (2021), “Some factors related to achieving blood pressure control goals in hypertensive patients being treated in some communes of Hai Phong city in 2016", *Vietnam Medical Journal*, Volume 503, special issue, pp. 147-153.2-98.

**INTRODUCTION**

According to the American Association of Family Physicians (AAFP), the family medicine (FM) is a combination of general clinical medicine, preventive medicine, psychology, and behavioral sciences. These actions of FM are based on six 6 principles including continuum of care, comprehensive care, coordinated care, prevention care, family context, and community context. The family medicine model has contributed to improving the quality of healthcare for people at the primary level with low cost. This model helped patients to receive comprehensive care in early stages and reducing cases hospitalized in specialized medical centers.

Vietnam is a country with good primary healthcare settings. There are over 11,000 commune health stations in all districts and around 70% of them employing medical doctors. However, the effectiveness of healthcare activities of these stations is still limited, that did not meet the needs of the people, and rapidly changing disease patterns. According to the report in 2017, non-communicable diseases accounted for 70% of the disease burden and were the leading cause of deaths. The strategy of renovation of the healthcare system based on the principles of family medicine, that was attention from the Ministry of Health. However, there were limited family medicine models and researches. Especially there was no research focusing on identifying the effectiveness of activities among commune healthcare applying principles of FM. The research question is “How the effectiveness of the commune health stations applying principles of FM in the management of chronic non-communicable diseases, especially hypertension?”. In order to make recommendations to improve the quality of the commune health stations, we carried out research: **"Effectiveness of hypertension management and treatment at commune health stations appying principles of FM"**. The research includes 2 objectives:

*1. Describe the current status in management and treatment of hypertension at 6 communes in Hai Phong in 2016.*

*2. Evaluate the effectiveness of hyprtension management and treatment at 3 commune health stations applying principles of family medicine in Hai Phong, 2017*.

**THE ORIGINAL CONTRIBUTIONS OF THE THESIS**

The research was conducted on 1719 hypertension patients aged 18 and older. This research contributed addition of more information for the national data system on the management and treatment of hypertension patients at commune health stations in Hai Phong city. Factors affected on managing blood pressure such as medication adherence, physical activity, diabetes status, diet, waist/hip ratio, and patient satisfaction.

The research results showed that the commune health stations applying principles of FM produced positive impact in the management and treatment of hypertension, as well as maintaining blood pressure targets for the patient. Lessons learned from the research contribute to train for communes health stations in management of non – communicable diseases including hypertension applying FM principles.

**STRUCTURE OF THE THESIS**

The main thesis has 134 pages, including:

 Introduction: 2 pages

 Chapter 1 – Overview: 34 pages

 Chapter 2 – Subjects and methods: 22 pages

 Chapter 3 – Results: 38 pages

 Chapter 4 – Discussion : 35 pages

 Conclusion and recommendations: 3 pages

# The thesis has 160 references, 71 references in Vietnameses and 89 references in English. The thesis has 55 tables and 13 figures. The appendix of this research included 7 appendices with 53 pages

# Chapter 1: OVERVIEW

# FAMIY MEDICINE AND PRIMARY HEALTHCARE

Family medicine (FM) refers to the specialist of medicine with its own philosophy and principles. A family doctor, who is known as a General Practitioner (GP) in several countries, is a physician specializing in FM [143].

Primary health care is essential health care based on practical, scientifically sound, and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family, and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first elements of a continuing health care process (Alma Ata,1978) [146].

**1.2. Current status of hypertension management**

Hypertension is a silent disease and is one of the top 8 causes of disability and death globally. This is a leading public health concern. People's awareness about the disease is still limited and patients did not strictly adhered to treatment. In addition, the competence of primary healthcare setting, screening activities for early detection of diseases are limited. This leads to a great challenge in obtaining the goal of management for hypertension. In Vietnam, the Government focuses on the prevention of hypertension, that becomes a national target program since 2008. The project on prevention of non-communicable diseases has been implemented 63 prefectures period 2012-2014. 84,136 health workers have been educated and trained in hypertension prevention. The project was carried for managing and screening for 2,203,893 people/1,179 communes. This project detected 365,182 people with hypertension in which 181,861 people did not detect people with hypertension previous, and 44,206 people with hypertension were managed. Thus, the project was carried for screening hypertension accounting for 10% communes after 10 years. The Ministry of Health reported 12 million people with hypertension in the community in 2015. There were 57% undetected hypertension, over 80% untreated hypertension, and 70% hypertension without education of complications of hypertension.

**1.3. Intervention of management hypertension models**

- Treatment model includes medical examination and prescription: Management and treatment of hypertension at the hospital

- Model of healthcare in community and commune: Health education regarding hypertention, healththy lifestyles, risks prevention.

- Model of management and treatment of out-patient at primary health care level.

**Chapter 2 : RESEARCH SUBJECTS AND METHODS**

* 1. **Research subjects, location, and time**
		1. ***Subjects***
			+ Patients ≥ 18 years older
			+ Selection criteria:
		+ Patients are diagnosed with hypertension according to the guidelines of the Ministry of Health in 2010 applied to medical staff to measure following the correct procedures [10]
		+ Systolic blood pressure ≥ 140mmHg;
		+ and/or diastolic blood pressure ≥ 90mmHg.
		+ Patients with hypertension who have been residing in the study area at least 3 months
		1. ***Research location***

***-*** Cross-sectional study

* + - * + An Lao district: Quoc Tuan and Bat Trang communes
				+ Tien Lang district: Đoan Lap and Bach Đang communes
				+ Vinh Bao district: Tran Duong and Hoa Binh communes

- Controlled before – and – after study

* + - * + Intervention groups: three communes including Hoa Binh, Bach Đang, and Bat Trang
				+ Controlled groups: three communes including Tran Duong, Quoc Tuan và Đoan Lap
		1. ***Research period:*** from May 2016 to December 2018
	1. **Methods**
		1. ***Study design***

Cross-sectional study and interventional study with controlled group and compared before and after.

* + 1. ***Sample***
			1. *Sample size for Cross-sectional study*
* 1719 hypertension patients at 6 sellected communes. There are 289 patients in Hoa Binh commune, 279 at Tran Duong commune, 274 at Đoan Lap commune, 306 at Bach Đang commune, 296 at Bat Trang commune, and 275 at Quoc Tuan commune.
	+ - 1. *Sample size for Interventional study, before – and – after intervention*
* Intervention groups: 891 hypertension patients and 896 hypertension patient after intervention
* Controlled groups: 828 hypertension patients and 845 hypertension patients after intervention.
	1. **Describe data collection and techniques and tools**
		1. ***Variables and indicators research:***

- Curent status of management and treatment for hypertension at commune health stations in two suburban districts of Hai Phong in 2016

 + Blood pressure: measurement, diagnose, treatment, obtaining target blood pressure, adherence, counseling activity

 + Risk factors for hypertension: Height index, weight, waist circumference, waist/buttock circumference, BMI, diet, physical activity, alcohol/beer use, smoking

- Evaluation of effectiveness of management and treatment hypertension based on principles of FM at commune healthcare settings in Hai Phong năm 2017-2018

 + Management of risk factors: reduce salt, physical activities, smoking, anthropometric index.

 + Management of treatment for hypertention

 +Using medical services in commune health care: Examination, treatment, management hypertension, satisfied

* + 1. **Techniques and tools for collection data**
			1. *Tools for collection data*

Using a designed questionnaire consisting of 5 parts:

* Demographic information of research subjects (age, gender, ethnicity, education level, marital status, occupation)
* Medical history (personal history, family history, cardiovascular disease, hypertension, diabetes)
* Risk behaviors (tobacco, alcohol, diet, physical activity)
* Medical examination and treatment services (setting of medical examination and treatment, level of satisfaction)
* Anthropometric index and blood pressure (weight, height, hip circumference, waist circumference, blood pressure).
	+ - 1. *Techniques for data collection*

Information was collected from patient examination and interviews at the time before and after the intervention using a set of prepared questionnaires (Appendix 1).

All survey questions and patient examination information are checked by the supervisors and it is completed the same day or next day to avoid information omissions.

* + - 1. *Standards for data information*
* Classification of hypertension and blood pressure control goals: according to the Vietnam Heart Association in 2018[39]
* BMI: according to WHO applicable to people in Asia Pacific [134].
* Standards for assessing waist circumference and waist/buttock index according to WHO [151]
* Standards for assessing physical activity: Ministry of Health 2019 [24]
* Standards for smoking, pipe tobacco: WHO [147]
* Criteria for assessing adherence to treatment according to the MMAS – 8 [115]
* Standards for assessment of alcohol use according to Vietnam's Ministry of Health in 2015 [11]
* Standards of salty eating according to WHO [157].
	+ - 1. *Data collection for intervention research*

 Intervention program:

- Family Medicine training for doctors treating at commune health care: Each commune health care station selected 1 doctor to train with certificate on Family Medicine, for 3 months.

- Training on management of hypertension according to the principles of FM.

- Implement management, treatment, care and counseling for hypertensive patients at commune health care according to FM principles:

• Management outpatient medical records and electronic medical records for hypertension patients:

o Implementation of outpatient medical records for hypertension patients: using the form of personal health management records according to Decision No. 831/QD-BYT dated March 11, 2017 of the Minister of Health

o Management of hypertensive patients by electronic medical records: Provide 01 computer for each intervention clinic, supply, install and guidline using the software " family doctor's medical record" of Phuong Nhu company for 3 commune health care settings, providing accounts for doctors.

o Prepare and update medical examination information on paper and electronic records in the "family doctor's medical record" software for all hypertensive patients who come for examination and treatment at health care settings implementing intervention.

o Distributing medical records to patients in order to the patients can self-manage the disease, and coordination between medical team and patient in hypertensionmanagement.

o Remind patients to adhere to treatment and schedule for re-visits doctors through the commune healthcare team and relatives. Schedule of re-visits of hypertensive patients will be recorded in medical records so that patients and family members know the schedule; At the same time, the appointment schedule will also be extracted from the "family doctor's medical record" software before 1 week and the patient list will be sent by the health care staff in commune health care settings to the health worker to the patients that can remind the patient to be re-examined on time.

o Transfer patients who are managing hypertension at commune health settings to hospitals for screening the risk factors and early detection of target organ damage.

o Supervision and support directly from doctors at the commune health care settings once a month and making a phone indirectly and software "family doctor's medical record" weekly.

• Examining and managing patients according to the principles of FM: continuous (monitoring by FM records, plan re-examination from first visit, get information after referrals), comprehensive (fully examined both physically and mentally), family-oriented, prevention-oriented, coordination of resources for patient care, attention to community factors.

• Organize group activities of hypertensive patients with doctors who have been trained regarding FM for 3 month/time. This activities aimed to increase opportunities, exchange and discuss between patients and doctors about adherence treatment as well as control risk factors at commune health care settings.

* 1. **Analysis statistics**

 The collected data was cleaned, entered into Epidata 3.1 software and processed with Stata 12.0 software. Data was entered, cleaned, managed and analyzed by using SPSS 22.0 software.

* 1. **Ethnic consideration**

The study was carried out in accordance with the proposal approved by board of Hai Phong University of Medicine and Pharmacy and there was an agreement with the consent of the leaders of the commune health care settings before conducting the research. People participated in the study voluntarily after the investigator explained the purpose of the study. Those refused to participate in research, they will not be affected any benefits, that they can received from health programs or services. They can notify the researcher if they want to withdraw from this research anytime.

# Chapter 3: RESULTS

# 3.1. Current status of hypertension management and treatment at commune health stations.

***3.1.1. Current status of hypertension management and treatment at commune health stations***

Table 3.4. Classification of hypertension of study subjects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Classification Hypertension** | **Tien Lang** | **An Lao** | **Vinh Bao** | **Chung** |
| n | % | n | % | n | % | n | % |
| Optimal and normal  | 24 | 4,1 | 32 | 5,6 | 38 | 6,7 | 94 | 5,5 |
| High normal | 48 | 8,3 | 35 | 6,1 | 30 | 5,3 | 113 | 6,6 |
| Grade 1 hypertension | 326 | 56,2 | 265 | 46,4 | 283 | 49,8 | 874 | 50,8 |
| Grade 2 hypertension | 110 | 19,0 | 169 | 29,6 | 153 | 26,9 | 432 | 25,1 |
| Grade 3 hypertension | 72 | 12,4 | 70 | 12,3 | 64 | 11,3 | 206 | 12,0 |
| **Total** | **580** | **100** | **571** | **100** | **568** | **100** | **1.719** | **100** |
| SBP ± SD | 150,6 ± 15,8 | 152,4 ± 18,7 | 149,9 ± 16,8 | 151,0 ± 17,2 |
| p | 0,003 |  |
| DBP: ± SD | 88,8 ± 10,9 | 89,1 ± 10,5 | 92,6 ± 11,1 | 90,2 ± 10,9 |
| p | 0,545 |  |

**Remarks:** 50,8% patient with Grade 1 hypertension, Grade 2 hypertension, Grade 3 hypertension respectively: 25,1% and 12,0%. 12,1% (5,5% patients with Optimal and normal, 6,6% patients with high normal) patients obtained BP target.

**Table 3.10: Percentage of hypertensive patients who were diagnosed with hypertension before the study**

**(n=1.513)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Diagnose hypertension**  | **Tien Lang** | **An Lao** | **Vinh Bao** | **Chung** |
| n | % | n | % | n | % | n | % |
| Diagnosed  | 458 | 86,7 | 412 | 80,9 | 365 | 76,7 | 1.235 | 81,6 |
| Undetected  | 70 | 13,3 | 97 | 19,1 | 111 | 23,3 | 278 | 18,4 |
| p | 0,000 |  |
| **Total** | **528** | **100** | **509** | **100** | **476** | **100** | **1.513** | **100** |

**Remarks**: 81.6% of patients who had ever measured blood pressure were diagnosed with hypertension by medical staff, 18.4% of patients had ever had blood pressure measured by medical staff but had not yet been diagnosed with hypertension. Vinh Bao has the highest number of hypertensive patients with undiagnosed hypertension (23.3%), Tien Lang has the lowest number of patients with undiagnosed hypertension (13.3%). The difference is statistically significant with p<0.001.

**Table 3.12: Percentage of hypertensive patients obtaining treatment goals among treated patients (n=749)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Treatment goals** | **Tien Lang** | **An Lao** | **Vinh Bao** | **Chung** |
| n | % | n | % | n | % | n | % |
| Obtain  | 72 | 24,7 | 67 | 26,8 | 68 | 32,9 | 207 | 27,6 |
| Not obtain | 220 | 75,3 | 183 | 73,2 | 139 | 67,1 | 542 | 72,4 |
| p | 0,125 |  |
| **Total** | **292** | **100** | **250** | **100** | **207** | **100** | **749** | **100** |

**Remarks**: 27.6% of treated hypertensive patients reached target blood pressure (<140/90 mmHg). 72.4% of treated hypertensive patients did not achieve the target blood pressure. There was no difference between districts with p>0.05.

**Table 3.18: Satisfaction of patients for health care activities at commune health care settings**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Healthcare** | **Tien Lang** | **An Lao** | **Vinh Bao** | **Chung** |
| n | % | n | % | n | % | n | % |
| Satisfied | 101 | 34,6 | 92 | 36,8 | 93 | 44,9 | 286 | 38,2 |
| Unsatisfied | 14 | 4,8 | 78 | 31,2 | 44 | 21,3 | 136 | 18,2 |
| Never visit  | 177 | 60,6 | 80 | 32,0 | 70 | 33,8 | 327 | 43,7 |
| **Total** | **292** | **100** | **250** | **100** | **207** | **100** | **749** | **100** |

**Remarks**: 43.7% of the hypertensive patients responded never visit to the commune healthcare settings, 38.2% of the hypertensive patients were satisfied with the medical services of the commune healthcare settings.

***3.1.2. The factors related to effective management of hypertension treatment***

Table 3.31. Multivariate analysis of the factors related to failure in treatment goal for hypertensive patients (n=749)

|  |  |  |
| --- | --- | --- |
| **Variables** | **OR (95% CI)** | **p** |
| Adherence |  |  |
| No vs yes | 8,58; (5,57 – 13,23) | **0,000** |
| Physical activities  |  |  |
|    No vs yes | 3,61; (2,20 – 5,919) | **0,000** |
| Diabetes history |  |  |
| Yes vs No | 2,95; (1,55 – 5,63) | **0,001** |
| Diet |  |  |
| With salt vs limited salt | 3,76; (2,50 – 5,65) | **0,000** |
| Waist circumference |  |  |
| Large vs Normal | 1,32; (0,84 – 2,08) | 0,229 |
| waist and hip index |  |  |
| Large vs Normal  | 1,62; (1,01 – 2,61) | **0,046** |
| Treatment settings  |  |  |
| Others vs commune health stations | 0,936; (0,41 – 2,16) | 0,877 |
| **p = 0,000 , R2 = 39,1%** |  |  |

**Remarks:** The results of multivariable analysis showed that the factors related to blood pressure control did not reach the target in patients: Non-adherence to drug therapy (OR=8.58; p<0.001), activity insufficient physical strength as recommended (OR=3.61; p<0.001), history of diabetes (OR=2.95; p<0.001), salty diet (OR=3.76; p<0.001) and large waist and hip index (OR = 1.62; p<0.05).

* 1. **Effectiveness of hypertension management and treatment at commune health stations applying FM principles.**
		1. ***Education and counseling from medical staffs***

Table 3.33: Effectiveness of intervention in counseling on salt reduction and physical activity

|  |  |  |
| --- | --- | --- |
| **Interventions** | **CSHQ (%)** | **HQCT (%)** |
| **IGs** | **CGs** |
| Reduce salt | 68,5 | 2,0 | 66,5 |
| Physical activities  | 93,8 | 1,7 | 92,1 |

*Note: ICs: Intervention groups; CGs Controlled groups*

**Remarks**: The effectiveness of salt reduction and physical activity after receiving counseling intervention after 1 year was 66.5% and 92.1%, respectively.

Table 3.35: Effectiveness of intervention for weight management and smoking after receiving counseling

|  |  |  |
| --- | --- | --- |
| **Interventions** | **CSHQ (%)** | **HQCT (%)** |
| **IGs** | **CGs** |
| Weight management  | 123,3 | 2,1 | 121,1 |
| Smoking harm | 83,5 | 12,3 | 71,2 |

*Note: ICs: Intervention groups; CGs Controlled groups*

**Remarks:** The effectiveness of intervention for weight management and smoking harm after 1 year, the percentage of patients received counseling regarding to weight management and smoking harm were 121.1% and 71.2% respectively.

***3.2.2 Evaluation of the effectiveness of hypertension management and treatment on anthropometric index after intervention at commune health stations applying the principles of family medicine***

Table 3.37 and Table 3.39: Effectiveness on anthropometric index after intervention

|  |  |  |
| --- | --- | --- |
| **Interventions** | **CSHQ (%)** | **HQCT (%)** |
| **IGs** | **CGs** |
| Waist  | 2,5 | -0,9 | 3,4 |
| Waist/hip index | 2,5 | -0.4 | 2,9 |
| BMI index | 1,9 | 0,4 | 1,6 |

*Note: ICs: Intervention groups; CGs Controlled groups*

**Remarks**: Effectiveness on anthropometric index after intervention showed that waist circumference, waist/hip index and BMI after 1 year were 3.4%; 2.9% and 1.6% respectively.

* + 1. ***Effectiveness on behavior regarding to practice for reducing salt and physical activities***

Table 3.41: Effectiveness on behavior regarding to practice for reducing salt and physical activities

|  |  |  |
| --- | --- | --- |
| **Interventions** | **CSHQ (%)** | **HQCT (%)** |
| **IGs** | **CGs** |
| Reducing salt | 9,2 | -0.9 | 9,5 |
| Physical activities | 25,5 | 0,5 | 25,0 |

*Note: ICs: Intervention groups; CGs Controlled groups*

**Remarks:** The effectiveness of the intervention on salt reduction and physical activity after 1 year were 9.5% and 25.0% respectively.

* + 1. ***Effectiveness of the intervention on measuring blood pressure and diagnosing hypertension***

Table 3.43:Effectiveness of measuring blood pressure and diagnosing hypertension

|  |  |  |
| --- | --- | --- |
| **Intervention**  | **CSHQ (%)** | **HQCT (%)** |
| **IGs** | **CGs** |
| BP measurement | 9,4 | 2,6 | 6,8 |
| Hypertensive diagnosis | 20,6 | -5,8 | 26,5 |

*Note: ICs: Intervention groups; CGs Controlled groups*

**Remarks:** The effectiveness of the intervention on measuring blood pressure and diagnosing hypertension was 6.8% and 26.5% respectively.

Table 3.45:Effectiveness of interventions for hypertension management

|  |  |  |
| --- | --- | --- |
| **Interventions**  | **CSHQ (%)** | **HQCT (%)** |
| **IGs** | **CGs** |
| Hypertension treatment | 38,5 | -6,7 | 45,2 |
| treatmentadherence | 133,6 | 4,2 | 129,5 |

*Note: ICs: Intervention groups; CGs Controlled groups*

**Remarks:** The effectiveness of hypertension treatment and treatment adherence was 45.2% and 129.5% respectively**.**

Table 3.47: Effectiveness of interventions on blood pressure to obtain treatment

|  |  |  |
| --- | --- | --- |
| **Interventions**  | **CSHQ (%)** | **HQCT (%)** |
| **IGs** | **CGs** |
| Blood pressure goals | 144,2 | 12,1 | 132,1 |

*Note: ICs: Intervention groups; CGs Controlled groups*

**Remarks:** The effectiveness of interventions on hypertensive patients, who obtained goals in controlling blood pressure accounting for 132.1%.

***3.2.5. Medical examination and treatment at the commune health stations***

Table 3.49: Effectiveness of intervention for medical examination and treatment for hypertension patients at commune health stations

|  |  |  |
| --- | --- | --- |
| **Interventions** | **CSHQ (%)** | **HQCT (%)** |
| **IGs** | **CGs** |
| Regularly examination | 104,6 | -7,6 | 112,2 |
| Hypertension treatment  | 98,3 | -9,8 | 108,1 |

*Note: ICs: Intervention groups; CGs Controlled groups*

**Remarks**: The effectiveness of interventions on hypertensive patients who were regularly examination and hypertension treatment at commune health stations were 112.2% and 108.1%respectively.

Table 3.51: Effectiveness on satisfaction with medical examination and treatment services at commune health setting

|  |  |  |
| --- | --- | --- |
| **Intervention** | **CSHQ (%)** | **HQCT (%)** |
| **IGs** | **CGs** |
| Satisfaction | 24,3 | 4,0 | 20,4 |

*Note: ICs: Intervention groups; CGs Controlled groups*

**Remarks**: The effectiveness of intervention on satisfaction about medical examination and treatment services at commune health stations was 20.4%.

**Chapter 4: DISCUSSION**

# Current status of hypertension management and treatment at commune health stations.

* ***Current status of hypertension management***

Globally and in Vietnam, hypertension is one of the leading causes of death, disability and medical burdens [163]. To be more detailed, the prevalence of undiagnosed and managed diseases in Vietnam is growing [72]. People's awareness of the disease is still limited, patients have not strictly complied with treatment, the capacity of medical facilities doesn’t meet all demands, screening activities for early detection of the disease are not varied [29], [30], [69], [110]. This situation leads to a massive challenge in achieving the goal of controlling hypertension in Vietnam. Primary health care is one of the key goals to improve health, disease prevention, early diagnosis and treatment, rehabilitation, palliative care along life cycle, and public health care. The above researches show that there is a difference between the rate of controlling the blood pressure and target blood pressure at the hospital and public. Having said that, despite the differences in the study population and blood pressure targets between studies, we found that over time the trend in blood pressure control in our country has leveled up, the rate of target blood pressure attaining has gradually increased, and this rate is higher in developed countries than in developing countries. Besides that, we also noticed that although hypertension is not too hard to diagnose due to simple methods of diagnosis and can be acquired to every heath facility, but a wide range of patients have not been diagnosed, or diagnosed but not treated, or treated with unstable blood pressure. In our study, 28.2% of hypertensive patients remained undiagnosed, 39.4% of the diagnosed patients were untreated and only 27.6% of those had achieved the target blood pressure.

* ***The factors related to effective management of hypertension treatment***

Hypertensive management is the implementation of comprehensive solutions including: 1, Strengthen the health system, improve the quality of human resources, appropriate equipment, medicine and the availability of consulting services, screening, diagnosis, treatment and maintain long-term management of medical records; 2, Improve the knowledge, attitudes and practices of hypertensive patients so that they can change their lifestyle behavior, increase physical activity, adopt a proper diet of nutrition, adhere to treatment to achieve their target blood pressure, and prevent possible long-term side effects [129]. Many risk factors have been identified as risk leading to hypertension in measurement including non-behavioral factors such as age, gender, family history, etc. Behavioral risk factor can be changed such as smoking, drinking a lot of alcohol / beer, inappropriate diet (salty eating, eating a lot of fat), inactivity ... and intermediate or biochemical factors such as overweight, obesity, dyslipidemia [40]. Some studies at home and abroad also show factors of age, gender, body mass index, adherence to treatment, diet and physical activity... it affects the incidence of hypertension as well as affects the control of the target blood pressure [30], [42], [46], [78], [81], [92].

Our results show that there is an association between blood pressure control and adherence to drug treatment, recommended sufficient physical activity, a history of diabetes mellitus, a salty diet, and a waist hip ratio. Our results are similar to that of authors in Vietnam and abroad [51], [60], [73], [78], [81], [131], [110].

**4.2. Effectiveness of hypertension management and treatment at commune health stations applying FM principles.**

***4.2.1. Evaluation of the effectiveness of hypertension management and treatment on anthropometric index after intervention at commune health stations applying the principles of family medicine***

Our study results show that, at the time after the intervention, the number of patients receiving advice from medical staff about risk factors increased meaningfully compared to pre-intervention and compared to the controlled groups (p<0.01). In terms of salt reduction counseling, tobacco harm, the number of patients receiving counseling increased by 30.6%, 25.3% respectively compared to before the intervention, this rate in the certificate group increased by 0.9% and 3.7% respectively. For counseling on physical activity and weight management, at the time after the intervention the number of patients receiving these consultations in the intervention groups increased to 34.5% and 24.9%, respectively, while the rate in the symptom group was 0.9% and 0.5%, respectively. CSHQ increased from 66.5 to 121.1%. As such, clinics operating under the FM principle have markedly improved counseling for people with hypertension. Some studies at home and abroad have also shown that training interventions to improve the capacity of junior health workers are also markedly effective for communication and counseling activities on hypertension.

From the results of our research as compared to the results of a number of intervention studies in the world and Vietnam, the effectiveness of intervention to improve the capacity of health staffs of the primary health care, especially commune heath center commune on hypertensive management, has shown that the effectiveness of intervention was quite remarkable. The results of the study indicate that not only the quality of health workers is improved but more importantly, the effectiveness of management, treatment of achieving and maintaining the target blood pressure of hypertensive patients in the community also has good results – Another evidence to confirm that if receiving more supported, commune heath center commune is fully capable of implementing hypertensive management effectively.

***4.2.2. Effectiveness on behavior regarding to practice for reducing salt and physical activities***

* *Effectiveness on behavior regarding to reduce salt:*

Reducing salt: Although the intervention had only been carried out for a period of 12 months and only had a propaganda effect on the harmful effects of salty eating (which is not available for direct observation or measurement), the study has also obtained initial results, after the intervention, the proportion of patients in the intervention groups who performed light eating increased by 5.2% compared to pre-intervention, while the rate in the controlled groups decreased by 0.2%. In middle- and low-income countries, salt is commonly used to preserve meat and fish and as a spice cooking and also during meals. Simple dietary changes, such as not eating salty foods and not adding salt when eating, can reduce consumption by 3-4.5 grams Na per day, equivalent to 30% of average daily intake [148].

Changing the salt-reducing diet practices of people with hypertensive patients is also a very important factor in the treatment and prevention of long-term side effect of hypertension. Our study results are consistent with other authors on changes in salt-reducing dietary practices of people with hypertension [6],[62], [73]. However, the change in the salt-reducing diet depends somehow on the cultural habits of people, for example, people in the sea change salty eating habits more slowly. According to Le Quang Tho's study on the effectiveness of interventions in the management of hypertension, the number of patients in the salt-restricted practice intervention groups increased by 29.4% compared to pre-intervention while this rate in the controlled groups decreased by 2.1% [62]. As regard to Nguyen Thanh Binh's study, when they evaluated the effectiveness of the anti-hypertension of commune health center in ethnic Khmer people, also showed that the rate of salt eating among Khmer people in the study was high and significantly decreased after the intervention, in the intervention groups decreased from 91.5% to 80.8%, in the controlled groups decreased from 95.0% to 90.8%, the effectiveness of intervention reached 31.9% (p<0.05) [6]. The results also showed that two intervention communities that were believed to be effective in preventing non-communicable diseases, salt-reducing interventions were easier to implement than tobacco control. At the same time, this result also shows that communication on reducing salt eating to prevent hypertension as being deployed in the intervention groups can be effective. The results are also consistent with the conclusion that mere media campaigns in the UK that more than ten years have not been effective in changing people's behavior in terms of eating habits, except for salty and high-fat eating habits. Therefore, in order to control other risk factors of non-communicable diseases such as tobacco and alcohol, it is necessary to coordinate other solutions such as policies and laws.

* *Effectiveness on behavior regarding to physical activities*

In this study, after the intervention, the percentage of patients performing sufficient physical activity as recommended by WHO increased by 16.4% compared to pre-intervention, while this rate in the certificate group increased by 0.4%, the difference after intervention – before intervention in the intervention groups was 25.5%, in controlled groups, the rate is 0.5%. The effectiveness of intervention for physical activity after 1 year of intervention was 25.0%. Thus, in communes with clinics operating according to the principles of family medicine, doctors are improved skills in communication and counseling, with each patient visiting the clinic will be individualized counseling has brought about a significant change in health habits is enough physical activity as recommended by WHO.

Physical activity has significant health benefits and contributes to preventing non-communicable diseases, including hypertension. Changing physical habits is one of the important factors contributing to targeted blood pressure control, hypertension rates in the community, and intervention to change this habit is highly effective. Therefore, it is necessary to promote the consultation and guidance to change this beneficial habit to suit each specific audience to increase the percentage of hypertensive patients controlling the target blood pressure as well as limiting the progress of hypertension rates in the community.

***4.2.3. Effectiveness on anthropometric index after intervention***

Our results showed that the normal BMI, waist circumference, waist/hip index in the intervention commune were all slightly higher than pre- intervention, but this change did not make a difference to before intervention (p>0.05), it's the same in the controlled groups. The effectiveness of the intervention on BMI changes, waist circumference, waist/hip index after one-year intervention was 1.6%, 3.4% and 2.9%. As such, in our study there has been no effective change in anthropometric indicators associated with hypertension. The results of our study are also more impressive compared to domestic authors such as Pham The Xuyen’s study in Dien Bien: compared to before the intervention, in the intervention groups, the average BMI from 22.6 to 22.5; in the general population, the average BMI decreased from 22.8 to 22.7, but the intervention with the BMI average of the study subjects was not effective. Interventions for overweight, pre-obesity, obesity, and a larger-than-normal waist/hip index of the study subjects were not effective [73]. According to Nguyen Thanh Binh, the study of Khmer subjects in Tra Vinh also showed that there was no statistically significant change in waist/hip index, BMI before and after intervention. The effectiveness of the intervention on the normal waist/hip index is 1.8% and normal BMI is -2.5% [6] The non-achievement of the goal of BMI, waist circumference, waist/hip index may be due to the impact of insufficiently strong intervention (direct consultation and health education communication, no observation, measurement of energy in and out), in short time, may also be due to the patient's non-compliance with the instructions, including diet and physical activity.

* + 1. ***Effectiveness of the intervention on measuring blood pressure and diagnosing hypertension***

In this study, we chose an intervention solution to improve the quality of health station operations in the direction of commune health center operating according to the principles of family medicine and achieved positive results in the issue of increasing the number of people coming to the clinic, improving the satisfaction of people coming to the station in which the effectiveness of hypertension management in communes. This has also improved markedly. After the intervention, the proportion of patients in the intervention groups who had their blood pressure measured was 96.7%, which increased by 8.3% compared to pre- intervention, while the rate in the controlled groups was 89.9%, which increased by 2.3% compared to pre-intervention. In the intervention groups, the proportion of patients diagnosed with hypertension was 86.5% increased by 14.8% compared to pre-intervention and higher than the controlled groups (67.8% after the intervention and a decrease of 4.2% compared to pre-intervention).

Similarly, the effectiveness of intervention in the number of hypertensive patients who were treated, adhered to treatment, and blood pressure control also varied markedly compared to pre-intervention and to the controlled groups. The percentage of hypertensive patients who were treated, adhered to treatment, and blood pressure control in the intervention groups increased by 17.1%; 28,1%; 19.9%, respectively compared to pre-intervention. As such, our intervention was effective for blood pressure management both compared to the controlled groups and before the intervention.

To control blood pressure, almost all hypertensive patients were taken with medication along with behavioral changes. Thus, the effectiveness of controlling the target blood pressure was also due to the direct impact of the treatment drug. Adherence to treatment was critical to the effectiveness of special drug treatment in the treatment of chronic diseases such as hypertension because hypertension is a disease that requires regular monitoring, proper and sufficient daily, long-term treatment [10]. From the results of our study and similar research results at home and abroad it can be concluded that communication interventions in the community as well as counseling activities in health facilities have yielded very positive results in the management of hypertension, as well as maintaining the target blood pressure for the patient. However, changes in targeted detection, diagnosis, treatment and blood pressure control were achieved to varying degrees due to different study groups, different study times, and different interventions. Domestic studies on hypertension management on hypertensive patients were not much and especially interventions directed to commune health center were limited, this is an opportunity for new studies on this issue in Vietnam to provide more evidence of the effectiveness of intervention at clinics in activities. Medical examination and treatment activities and communication activities at the grassroots health system for policy making to improve the quality of grassroots health in medical examination and treatment activities, especially non-communicable disease management activities including hypertension.

**CONCLUSION**

1. **Current status of hypertension management and treatment at commune health stations**

 The study was conducted on 1719 hypertensive patients aged 18 years and older. The subjects in this study were 44.3% male and 55.7% female in 6 suburban communes in Hai Phong. We have made the following conclusions:

***The number of hypertensive patients who were undiagnosed, untreated, and not obtained the goal of treatment were high:***

- 12.0% of hypertensive patients had never measured BP until the study started screening, 28.2% of hypertensive patients had not been diagnosed with hypertension by medical staff, 56.4% of total hypertensive patients had not been diagnosed with hypertension by medical staff. treated. 72.4% of treated patients did not reach the target blood pressure.

- 12.1% of patients with blood pressure reached the target; 50.8% grade 1 hypertension; 25.1% grade 2 hypertension; 12.0% grade 3 hypertension.

- 31.6% of hypertensive patients are overweight or obese; 34.2% had an increased waist circumference; 75.5% of patients have an increased waist/buttock index; 51.9% have a habit of eating salty foods; 30.8% of patients are not physically active; 8.7% risk alcohol use; 23.4% of patients are currently smoking (pipe tobacco, tobacco).

- Among 749 hypertensive patients being treated: 25.9% of patients have never been counseled by medical staff on a salt-reducing diet, 36.6% of patients have never been counseled on a physical activity regimen.

- Factors related to blood pressure not reaching the target in patients are: non-adherence to drug therapy (OR=8.58; p<0.001), insufficient physical activity (OR=3.61; p<0.001), associated diabetes mellitus (OR=2.95; p<0.001), salty diet (OR=3.76; p<0.001) and large waist/buttock index (OR = 1, 62; p<0.05).

***Patients rarely visit commune health stations for hypertension management and treatment***

- 37.5% of hypertensive patients are satisfied with medical examination and treatment services at health stations, but only 13.9% of patients visit commune health stations for hypertension treatment

- 45.9% of patients have never been to a health station, 61.4% of patients choose a hypertension treatment facility where they register for health insurance. The rate of hypertension treatment failed to reach the treatment goal at other facilities is 1.27 times higher than that at commune health stations.

- Among the patients being treated for hypertension, 38.2% were satisfied with the medical services of the stations, 43.7% had never been to a health station.

**2.** **Effectiveness of hypertenstion management and treatment at commune health stations applying FM principles.**

***The effectiveness of hypertension treatment increased significantly in the intervention groups***

- 96.7% of patients in the intervention groupsf had ever measured their blood pressure, and the effectiveness of the intervention increased by 6.8%. 86.5% of patients in the intervention groups were diagnosed with hypertension, an increase of 14.8% compared to before the intervention, the effectiveness of the intervention was 26.5% compared to the controlled groups. 61.5% of patients in the intervention groups were treated for hypertension, 49.3% of patients adhered to treatment, an increase of 17.1% and 28.1% respectively compared to before the intervention.

- The effectiveness of intervention in hypertension treatment and treatment adherence was 45.2% and 126% respectively. Blood pressure reaching the treatment target increased by 19.9% compared to before the intervention while the controlled groups increased by 1.7%. The intervention efficiency was 132.1%.

***The percentage of patients visiting commune health stations******increased***

- At the time of intervention, the number of patients going to the health stations increased by 13.6%, and the number of patients receiving treatment for hypertension at the commune healthcare seeting increased by 11.5% compared to before the intervention. This rate in the controlled groups all decreased by 1.1%.

- The effectiveness of interventions on patients going to health stations and patients receiving treatment for hypertension to commune healthcare settings were 112.2% and 108.1%.

- The effectiveness of the intervention on satisfaction about services at commune health stations were 20.4%.

**RECOMMENDATIONS**

* Commune health stations applying the principles of family medicine is remarkably effective in the management and treatment of hypertension, in attracting patients to commune health stations. Strengthening support for commune health stations applying family medicine principles is very necessary, contributing to improving patient satisfaction and increasing the efficiency of management of chronic diseases, including hypertension.
* Commune health stations have doctors and applying the principles of family medicine, are qualified facilities to effectively manage hypertension treatment. They should be considered to undertake the management of hypertensive patients with health insurance cards.
* Continue to carry out studies to evaluate the effectiveness of commune health stations applying family medicine principles in broader fields to have comprehensive policies to enhance the effectiveness of commune health stations in providing care for the local people.