

MINISTRY OF EDUCATION & TRAINING MINISTRY OF HEALTH
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**EFFECTIVENESS OF NUTRITION EDUCATION AND
COMMUNICATION MODEL TO IMPROVE SOME RISK
FACTORS FOR HYPERTENSION IN THE COMMUNITY**

Major: Nutrition

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SUMMARY OF PhD THESIS

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INTRODUCTION

Hypertension (HBP) is a common disease in the world. According to estimates of the World Health Organization (WHO) by 2000 in the world would have about 972 million people with HBP (accounting for 26.4% of the population), and up to 7.5 million deaths due a direct cause of HBP. Forecasts by 2025 there are about 1.56 billion people with hypertension (Whelton PK, 2004).

A study by Vietnam Heart Institute (2008) in people aged 25 years or older at 8 provinces and cities in our country showed that the proportion of HBP has increased to 25.1%, meaning one in four adults suffered from HBP in our country. According to the recent National Survey (2015) of the Department of Preventive Medicine - MOH in adults aged 18-69 years old in 63 provinces/cities Vietnam showed that the prevalence of hypertension was 18.9%.

Hypertension if detected early, the control will be very effective and limit dangerous complications, decreased risk of death and disease burden reduction for themselves, their families and the whole society. Nutrition education and communication help people improve their knowledge, practice and since then implementing appropriate diet and increasing physical activity, an important contribution to reducing the risk factors of hypertension. In our country, the study on a nutrition education and communication model in prevention and control of HBP in the community has not been focused. The nutrition education and communication activities as well as communication materials about HBP has not been paid adequate attention to. Therefore, in order to contribute to the improvement of risk factors and limit the complications of HBP in the community, we conducted this theme aiming at:

1. Describe the status of hypertension, a number of risk factors and the knowledge and practice of prevention of hypertension in adults in Binh Luc, Ha Nam province in 2013.

2. Assess the effectiveness of the nutrition education communication model at the community to improve a number of risk factors for hypertension in adults.

SUMMARY OF NEW CONTRIBUTIONS OF THESIS

The study has provided relatively system data on the status of HBP in adults ≥ 18 years of age in two communes in Binh Luc district, Ha Nam province including data to determine the prevalence of HBP and the risk factors of HBP. The theme has identified the prevalence of 24.4% in adults and some risk factors related to hypertension including overweight, obesity, using a lot of foods with an increased risk of developing HBP, alcohol/beer consumption cigarette smoking and less physical activity....ect. The theme

also provides a evidence of effective model of health education and communication in which further focusing on the nutrition education and communication for a reasonable diet to prevent hypertension in the community and has showed a remarkable effectiveness in improving knowledge and practice of the community on prevention of hypertension: The proportion of respondents correctly understand the concept of hypertension, knowing the signs, consequences and risk of hypertension occurring in the study subjects in the intervention commune to be significantly higher as compared to the pre-intervention period and the control. The frequency of food consumption at a high risk causing hypertension in the intervention commune also fell much more as compared to the pre-intervention period and the control. The prevalence of some risk factors of hypertension also decreased compared to pre-intervention and compared to control commune.

STRUCTURE OF THESIS

The thesis with 150 pages excluding appendices, includes the following parts:

- Introduction and research objectives: 3 pages
- Chapter 1. Literature review: 42 pages
- Chapter 2. Subjects and methods: 25 pages
- Chapter 3. Results: 45 pages
- Chapter 4. Discussion: 31 pages
- Conclusions and recommendations 4 pages

The thesis has 107 references, including 52 in Vietnamese and 57 documents in English. The thesis includes 36 tables, 01 map, 2 diagrams, 6 charts. The appendix includes 22 subappendices with 46 pages.

Chapter 1. LITERATURE REVIEW

1.1. Hypertension and situation of hypertension in the world and in Vietnam

1.1.1. Concept, classification and the pathogenesis of hypertension

1.1.1.1. Concept of blood pressure and hypertension

**** Hypertension:***

According to the World Health Organization and the International Society of Hypertension (WHO-ISH), Hypertension is defined as a systolic blood pressure (SBP) of 140 mm Hg or more, or a diastolic blood pressure (DBP) of 90 mm Hg or more.

1.1.1.2. Classification of blood pressure

There are many ways of classifications but so far, the classification of the WHO / ISH (2003) has been widely used by the practicality and its applications.

Table 1.1. Classification of blood pressure according to WHO/ISH (2003)

Concept	Systolic blood pressure (mmHg)		Diastolic blood pressure (mmHg)
Optimal blood pressure	70	and	< 80
Normal blood pressure	< 130	and	< 85
Pre-hypertension	130 - 139	and/or	85 - 89
Grade I hypertension	140 -149	and/or	90 - 99
Grade II hypertension	160 -179	and/or	100 - 109
Grade III hypertension	≥ 180	and/or	≥ 110
Isolated systolic hypertension	≥ 140	and	< 90

In Vietnam, according to the recommendation of the National Heart Association Vietnam in 2008 and in guiding the management and treatment of HBP in 2010 by the Ministry of Health had recommended the use of Grade of blood pressure according to the WHO / ISH 2003 (Table 1.1) for the diagnosis, treatment and research related to hypertension.

1.1.3. Situation of hypertension in the world and in Viet Nam

1.1.3.1. Situation of hypertension in the world

Hypertension is a common chronic disease in the world and its prevalence rate is increasing rapidly. The number of people with HBP rose from 600 million in 1980 to 1 billion in 2008. According to the World Health Organization (WHO), hypertension is one of the six major risk factors affecting the distribution of the global burden of disease.

1.1.3.2. Situation of hypertension in Viet Nam

According to a result of health Statistical Yearbook over the years from 2000 - 2013, a number of people with hypertension per 100,000 population increased markedly. In particular, in 2010, the prevalence of hypertension was the highest (515.5 per 100,000 population).

1.1.4. Risk factors for hypertension

* *Non-modifiable risk factors:* age, gender, race, genetic factor

Although, this factor group can not be eliminated, but if there is a full understanding of hypertensive disease, people can strengthen to develop good habits, beneficial lifestyle for the prevention of hypertension and hypertensive complications.

* *Modifiable risk factors*

(*This group includes habits, lifestyle, mental state, physical activity , employment...affecting the incidence, severity and complications of hypertension*): Eat salty Smoking cigarettes, pipe tobacco, drink a lot of

alcohol, beer physical inactivity (sedentary lifestyle), stress (stress, excessive anxiety), stress (stress, anxiety, excessive).

1.1.1.2. Diseases are closely related to hypertension: Pre-hypertension, overweight, obesity, diabetes, dyslipidemia.

1.2. Role of nutrition and preventive measures of hypertension in the community

1.2.1. Role of nutrition for hypertension

There have been many studies demonstrating the link between an unreasonable diet regime with HBP. Nutrition is a part that is not lack of treatment of HBP.

Some studies on the effectiveness of probiotics in some foods play a role in reducing a blood pressure such as: increased use of soybean to reduce serum total cholesterol, LDL-C reduction and to lower blood pressure..

1.2.2. Preventive measures of hypertension in the world and in Vietnam: Improved diet regime, changes in behavior, lifestyle, no smoking. limits for alcohol/beer consumption, enhancing physical activity, checking your blood pressure regularly, preventing and managing diabetes

1.3. The nutrition education and communication model in the community

1.3.1. Role of nutrition education and communication in prevention of hypertension

Nutrition education and communication in order to convey the knowledge of nutrition to the community, improving the attitude and behavior of nutrition science, creating reasonable, safe and nutritional habits in the community, helping and orienting a nutritional practice according to practical, effective and scientific standpoints to achieve a safe, reasonable nutrition in the community to contribute importantly to the prevention of hypertension in the community.

1.3.2. A nutrition education communications model

Our theme applies a theoretical model, the Strategic Communication Model in the nutrition education and communication.

1.4. Some intervention studies applying the nutrition education and communication model in the community to improve the risk factors of hypertension in the world and in Vietnam

1.4.1. Some studies in the world

A study by Patience S (2012) aimed to changing the perception and management of HBP in the community, conducting the nutrition education for volunteers aged 65 and older, assessing BP, risk of heart disease ... and be followed up within 4-6 months. Results showed that 71% of volunteers returned to follow up after 4-6 months, their SBP decreased 16.9 ± 17.2 mmHg ($p < 0.05$; $n = 105$) as compared to the first examination.

Interventions have improved the awareness and management of hypertension of the elderly.

1.4.2. Some studies in Viet Nam

A study by Lai Duc Truong (2011) on the risk of non-communicable diseases in Thai Nguyen and the effectiveness of improving the health and reasonable nutrition conducted in a cross-sectional surveys in subjects aged 25-64 and undertaken a controlled before-and – after trial in subjects aged 45-64 years in the intervention commune (Huong Thuong) and the control commune (Yen Do) from March 2009 to January 2010. A models of health research and proper nutrition to prevent NCDs was applied in the intervention commune in this study and included the following activities: Health education and communication , participation and mobilization of community activities, management of high-risk subjects and enhancing the competence for health staff on communication skills to prevent NCDs including hypertension and other risk factors, results showed that the model had helped promote understanding of the subjects on NCDs, from that helping to change some risk behaviors.

Chapter 2 SUBJECT AND METHOD

2.1. Duration

The study was conducted from June 2013 to July 2015.

2.2. Study setting

The study was conducted in An Lao and Don Xa communes, Binh Luc district, Ha Nam province

3. Study subjects

2.3.1. Quantitative research

Adults aged 18 and older in An Lao (intervention commune) and Don Xa (control commune) in Binh Luc district – Ha Nam province.

2.3.2. Qualitative research

- District level: Health workers and representatives of government officials and a number of district departments.

- Commune level: Commune/village health workers and representatives of government officials and some branches in the commune and a representative of the people.

2.4. Study design

The study was conducted in two stages:

- **Stage 1:** A cross-sectional descriptive study was conducted to assess the knowledge, practice and prevalence of hypertension in adults.

- **Stage 2:** A controlled community-based intervention Trial

The efficacy of interventions is evaluated based on cross-sectional survey before and after the intervention.

2.5. Study sample

2.5.1. Sample size

2.5.1.1. Sample size for quantitative study

* *Sample size for cross-sectional descriptive study:*

$$n = Z_{1-\alpha/2}^2 \times \frac{p(1-p)}{d^2} \times de$$

According to the formula above, we calculate $n = 444$ for a commune.. In fact, we investigate in Don Xa commune: $n = 458$, and in An Lao commune: $n = 551$.

* *Sample size for community intervention study:*

* *Sample size for community intervention study:*

Applying the formula of calculation of sample size for preventive intervention:

$$n = Z_{\alpha} \frac{\left(\frac{p_0 + p_1}{q_0 + q_1} \right)}{\left[\ln(1 - \varepsilon) \right]^2}$$

We use the consequences rate of hypertensive disease (brain stroke / CVA) in the community before the intervention was 36.3%, this rate estimate was 50.0% after the intervention. Get $\alpha = 0.05$, so $Z_{0,05} = 1,96$, $\varepsilon = 0.1$, so $[\ln(1 - \varepsilon)]^2 = 0.01$. The sample size for community intervention calculate 540, in fact we investigated $n = 551$ in intervention commune and $n = 458$ in control commune.

2.5.1.2. Sample size for qualitative study

* *Sample size for a cross-sectional descriptive study:*

- *In district level:* 02 group discussions: 01 with representatives from the district health workers and 01 with the District Steering Committee. Each group discussion had 9 people. 02 in-depth interviews: 01 in-depth interviews with leaders of District People's Committee, 01 in-depth interviews with the director of the district health center.

- *In commune level:* 04 group discussions: 02 with commune health workers, . 02 with residents. 04 in-depth interviews : 02 with vice- chairman of Commune People's Committee, 02 with head of CHC.

* *Sample size for community intervention study :*

- *In district level:* 02 group discussions: 01 with representatives from the district health worker and 01 with the District Steering Committee. 02 in-depth interviews: 01 in-depth interviews leaders of District People's Committee, 01 in-depth interviews with the director of the district health center.

- *In commune level:* 04 group discussions: 01 with health workers of An Lao commune, 01 with representatives from authority and branches and mass organizations of An Lao commune, 02 with residents. 02 in-depth

interviews: 01 with vice- chairman of An Lao Commune People's Committee, 01 with head of An Lao CHC.

2.5.2. Sampling technique

- *To choose a study commune:* Purposive sampling includes An Lao commune and Don Xa commune of Binh Luc district because two communes with the same characteristics.

- *To chose household:* In each commune, from the list of villages in the commune, 4 villages randomly selected for the study. Based on a number of households in villages to calculate a number of households in each village need to be investigated. At each village, the first households selected by a single random method, the next household was selected to be a household with a gate near the household surveyed until enough a number of households of the village need to be surveyed (400 households per commune).

- *To choose interviewees:* Subjects are selected to gather information on demographic and socio-economic status of the families who have a major role in health care of the family. All other subjects in the household aged 18 years and older present in the household at the time of the study are interviewed to collect information on the status of hypertension, knowledge and practice on hypertension, eating habits related to hypertension.

2.6. Contents, variables and study indicators

2.6.1. Contents, variables and study indicators for a cross-sectional descriptive study (Objective 1)

* *General information of study subjects:*

- Variable group and indicators about general information of study subjects: Proportion by age, sex, educational level. In-depth interviews by survey questionnaires to collect information.

- Variable group and anthropometric indices: Weight, height, BMI, waist and hip circumferences, WHR.

* *Describe the situation of hypertension in study subjects including variables and indicators as follows:*

- Blood pressure readings.

- Systolic blood pressure: A mean systolic, blood pressure value and a mean diastolic blood pressure value. The general prevalence of hypertension, type of hypertension and blood pressure levels.

* *Describe some of risk factors for hypertension in the study subjects (Interview with the questionnaire to collect information on a number of risk factors) including variables and indicators:* The percentage of smoking, the percentage of drinking alcohol/beer, the percentage of eating salty, the prevalence of overweight and obesity, the rate of eating less vegetables and fruits, the percentage of physical inactivity.

* *Assessing the status of knowledge, practice to prevent hypertension in study subjects (interviews with questionnaires to gather information about the knowledge and practice to prevent hypertension) including variables and indicators:*

- Knowledge on hypertension prevention: The proportion of people knows about their blood pressure values, concepts, signs and consequences of hypertension. The proportion of people knows about risk factors for hypertension. The proportion of people knows about preventive measures of hypertension. Level of knowledge of hypertension prevention (based on knowledge points divided into 4 levels of knowledge: poor, moderate, fair and good).

- Practice on eating hypertension prevention: The proportion of complication prevention of hypertension in subjects with hypertension. The level of complication prevention of hypertension in subjects with hypertension (based on practical points divided into 4 levels: poor, moderate, fair, very good). Frequency of consumption of some foods is the risk of hypertension. The amount of average food consumption / day contributing hypertension prevention.

- Physical activity:

+ Frequency of physical activity at least 30 minutes per day.

+ Average sedentary time activity per day.

* *Identify needs for nutrition education and communication in order to reduce some risk factors for hypertension in the community:* Analyzing the information collected to see what the risk factors in the study area are? , What are the situation of hypertension, knowledge and practice in the study subjects.

2.6.2. Contents, variables and study indicators for the community intervention study (Objective 2)

* *Activities of health education and communication:* A number of training courses on enhancing the capacity. Communication skills on hypertension for health workers in the commune and villages. A number of counseling sessions directly at households. A number of times broadcasting on prevention of hypertension.

* *Effectiveness of the nutrition education and communication (The information collected from in-depth interviews and group discussions):* A number of training courses to enhance capacity implementing the communication model. The contents of communication on hypertension prevention have been done. Activities of social organizations participating in communication on the hypertension prevention. Changes in health worker's capacity participating in the nutrition education and communication model.

* *Changes in some risk factors after intervention:*

Comparing changes in some risk factors in each commune before and after intervention; the difference between the intervention commune and the control after intervention.

** Changes in knowledge, practice on the hypertension prevention:*

Comparing changes in knowledge, practice in the study subjects in each commune before and after intervention; the difference between the intervention commune and the control after intervention.

** Changes in anthropometric indices and blood pressure:*

- Comparing changes in anthropometric indices

- Changes in blood pressure values before and after intervention; the difference between the intervention commune and the control after intervention.

** Sustainability of the nutrition education and communication model (The information collected from in-depth interviews and group discussions):* The ability to maintain the activity of the model. The ability to replicate the activity of nutrition education and communication model.

2.7. Steps to build the nutrition education and communication model of intervention model on the hypertension prevention in An Lao commune

2.7.1. Steps to build the nutrition education and communication model

To Establish a Steering Board to coordinate and implement research projects. To create human resources: Based on existing networks including the Steering Board of District, Commune, commune health workers and village health workers; representatives of branches in commune and village. To assign responsibility for each target group with the participation of authority, local stakeholders, and at the same time, mobilizing community networks involved. To develop operational regulations.

2.7.2. Activities of the nutrition education and communication model on hypertension prevention

* We apply the Strategic Communication Model in the nutrition education and communication on hypertension prevention as follows:

- Identify communication reasons.

- Target subjects: The entire community, including subjects with hypertension and subjects without hypertension.

* Based on applying the above mentioned the Strategic Communication Mode, We implement the activities of nutrition education and communication on the hypertension prevention including the direct communication at the households and the indirect communication by distributing pamphlets, broadcasting the content via the commune loudspeakers' system.

* Post-intervention assessment, recommendations replicating the model to other villages after implementing the nutrition education and communication: implementation period from 28th, June to 10th, August, 2015.

2.8. Techniques and tools of information collection

2.8.6. Assessment of knowledge and practices on hypertension in study subjects

- To assess the knowledge and practice of the study subjects with hypertension, we conduct to give scores to answers on the knowledge and

practice of study subjects. Each correct answer is 1 point, wrong answer or no answer 0 point. Then calculating the ratio between the total points achieved by the subject on knowledge/practice divided by the total expected points and classification of knowledge practice into levels: Poor level: Total points of knowledge/practice are less than 50% of expected points. Moderate level: Total points of knowledge/practice are from 50% to < 70% of the expected points. Fair level: Total points of the knowledge/practice are from 70- < 90% of expected point. Good level: Total points of the knowledge / practice are $\geq 90\%$ of expected points.

- The expected points are: a number of points that the team wants the people who can be achieved to prevent illness. The expected points of knowledge and practice for hypertension based on the recommendations of the Ministry of Health on the hypertension prevention and control measures.

2.8.7. Criteria for evaluation of a number of risk factors

- Eat lots of fat: being a person who often eats fried foods (used daily or 3-6 times/week).

- Eat lots of sugar: being a person regularly eats sweet candy or drink soft drinks (used daily or 3-6 times/week).

- Eat a little fruits and vegetables: When the amount of green vegetables and fruits to eat less than 400g/day.

- Eat more/strengthening vegetable: When the amount of green vegetables and fruits to eat $\geq 400\text{g/day}$ (400 g of vegetables, fruit equivalent to 5 standard units).

- Having to drink alcohol/beer: It means that in the past 30 days, any day a person also drink alcohol/beer .

- Drink a lot of alcohol/beer: In men, drinking more than 3 standard cups/day, in women drinking more than two standard cups/day.

- Smoking: A person is considered to have the habit of smoking/pipe tobacco (both passive and active) was the past 30 days, every day smoking or inhaling passive smoke/pipe tobacco.

- Salty diet: eating saltier than the other members of the family.

- Reduced salt diet: eating less salt than before the intervention.

- Usual intake of food : The food is consumed daily and weekly .

- Less consumption of food : the food is consumed monthly or sometime it is bought / seasonal.

- Monthly food consumption or , occasional/seasonal : The food is regularly not used in every week or in every month.

- Daily or weekly consumption of food :The food was used 3-6 times/week.

- Regular physical activity: a physical active at least 30 minutes/day and from ≥ 4 days/week.

- Regular understanding about hypertension: To find out information about hypertension.

- Classification of economic status: Based on the classification of the economic situation of the Commune People's Committee in Binh Luc district, Ha Nam province in 2013.

2.8.9. Assessment of effectiveness of intervention model

- The effectiveness of change in health worker's capacity to participate in the nutrition education and communication model.

- The ability to maintain and replicate the nutrition education and communication model.

- Assessing the change in rate of a number of risk factors of hypertension, changes in knowledge and practice on hypertension prevention in the study subjects in the intervention commune as compared to before intervention and compared to the control commune.

- Assessing the effectiveness of nutrition education and communication intervention model on hypertension prevention based on changes in anthropometric indices and the prevalence of hypertension in the study subjects in the intervention commune as compared to before intervention and compared to the control commune.

Efficacy of intervention (%) = efficacy index of the intervention group minus the efficacy index of the control group.

2.9. Data processing and analysis

2.9.1. Quantitative data

The information collected is checked and cleaned and coded and then data entered into Epidata 3.1 software and analyzed on SPSS 16.0 software on the appropriate statistical test.

2.9.2. Qualitative data

Qualitative data are grouped into groups and analyzed by the method of comparison with various information sources.

2.11. The ethical aspects of research

The thesis is part of the state-level project with code DTDL.2012 -G / 32, this theme had approved by the Council of Ministry of Science and Technology and the Ethics Committee of Ha Noi Medical University according to Decision No. 122 / HDDD - DHYHN February 28, 2013

Chapter 3. STUDY RESULTS

3.1. Situation of hypertension, some risk factors and knowledge, practice on prevention of hypertension in adults in An Lao and Don Xa commune in Binh Luc district, Ha Nam province

3.1.2. Situation of hypertension in adults in An Lao and Don Xa communes in Binh Luc district, Ha Nam province

*** Prevalence of hypertension of in the study subjects in two communes:**

The overall prevalence of hypertension in adults in two communes was 24.4%, in which the prevalence rate of hypertension in the control commune (28.0%) was higher than that in the interventions commune (21.4%), the difference was statistically significant, with $p < 0.05$.

In three types of hypertension, systolic HP accounted for the highest rate: The overall proportion in two communes was 21.9%, the rate in the control commune (25.3%) was higher than that in the intervention commune (19.1%), the difference was statistically significant, with $p < 0.05$. The lowest prevalence of hypertension in both SBP and DBP: The general prevalence in 2 communes was 9.7%, the prevalence in the control was 9.8%) and no difference as compared to the intervention commune (9.6%), $p > 0.05$. Grade I hypertension accounted for the highest rate: The general rate in 2 communes was 16.9%, the rate in the control commune was 17.9% higher than that in the intervention commune (14.3%), but the difference was not statistically significant, with $p > 0.05$. The lowest prevalence was grade III hypertension: The general prevalence in 2 commune was 2.5%, The rate in the control was 2.2% and no difference as compared to the intervention commune (2.4%) , $p > 0.05$.

3.1.3. Risk factors for hypertension in adults in An Lao and Don Xa communes in Binh Luc district, Ha Nam province

Table 3.4. Percentage of some risk factors for hypertension in two communes

Risk factor	General (n = 1009)		Control commune (n = 458)		Intervention commune (n = 551)		p
	n	%	n	%	n	%	
Smoking*	657	65.1	310	67.7	347	63.0	> 0.05
Dinking alcohol/beer*	234	23.2	119	26.0	115	20.9	> 0.05
Eating salty*	230	22.8	108	23.6	122	22.1	> 0.05
Overweight, obesity (BMI ≥ 25)*	59	5.8	31	6.8	28	5.1	> 0.05
Eating a little vegetables and fruits*	609	60.4	272	59.4	337	61.2	> 0.05
Physical inactivity*	547	54.2	255	55.7	292	53.0	> 0.05

*Test χ^2

Remarks: The percentage of some risk factors for hypertension in the study subjects in 2 communes was rather high, in which smoking accounted for the highest proportion (the general percentage in two communes was 65.1%, 67.7% in the control and 63.0% in the intervention commune), followed by eating less vegetables, fruit (the general percentage in two communes was 60.4%, 59.4% in the control commune and 61.2% in the intervention commune), and physical inactivity (the general percentage in two communes

was 54.2%, 55.7% in the control and 53.0% in the intervention commune, the lowest percentage was overweight, obesity (the general percentage in two communes was 5.8%, 6.8% in the control and 5.1% in the intervention commune). The percentage of some risk factors in the intervention commune and the control was significantly different ($p > 0.05$).

Table 3.8. Knowledge about hypertension values myself, the concepts, signs and consequences of hypertensive in the study subjects in two communes

<i>Concepts, signs and consequences of hypertension</i>	General (n = 1009)		Control commune (n = 458)		Intervention commune (n = 551)		P
	n	%	n	%	n	%	
To know about hypertension values yourself	142	14.1	69	15.1	73	13.2	> 0.05
To understand correctly concept of HBP	151	15.0	78	17.0	73	13.2	> 0.05
Knowing signs of HBP							
Headache	281	27.8	128	27.9	153	27.8	> 0.05
Dizziness / vertigo	476	47.2	220	48.0	256	46.5	> 0.05
Angina	32	3.2	10	2.2	22	4.0	> 0.05
hot / blushed face	285	28.2	129	28.1	156	28.3	> 0.05
Knowing consequences of HBP							
Brain stroke /CVA	393	39.0	193	42.1	200	36.3	> 0.05
Heart failure/ Cardiovascular diseases	111	11.0	50	10.9	61	11.1	> 0.05
Eye complications	16	1.6	8	1.7	8	1.5	> 0.05
Liver failure , renal failure	7	0.7	1	0.2	6	1.1	> 0.05
Death	170	16.9	69	15.1	101	18.3	> 0.05

* χ^2 test

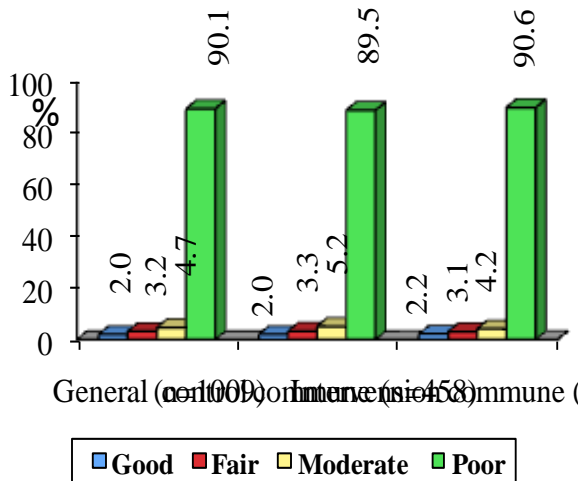
Remarks: A number of study subjects knowing about their blood pressure readings were very low (the general percentage in two communes was 14.1%, 15.1% in the control and 13.2% in the intervention commune). The proportion of study subjects understanding correctly the concept of hypertension was low (the general percentage in two communes was 15.0% , 17.0% in the control and 13.2% in the intervention commune). For signs of HBP, a number of people knowing a sign of dizziness / vertigo accounted for the highest proportion (the general percentage in two communes was 47.2%, 48.0% in the control and 46.5 in the intervention commune, followed by signs of hot flashes / blushed face (the general percentage in two communes was 28.2% , 28.1% in the control commune, and 28.3% in the intervention commune) and headache (the general percentage in two communes was 27.8%, 27.9% in the control commune, and 27.8% in the

intervention commune). For consequences of hypertension, a number of people knowing the consequences of brain stroke accounted for the highest proportion (the general percentage in two communes was 39.0% , 42.1% in the control and, 36.3% in the intervention commune) the lowest was the consequences of liver failure, renal failure (the general percentage in two communes was 0.7%, 0.2% in the control and 1.1% in the intervention commune).

The proportion of study subjects knowing about their blood pressure readings, understanding correctly the concept of hypertension, knowing a sign of hypertension and the consequences of hypertension in two communes was similar.

The proportion of study subjects knowing HBP can be preventable and the general percentage in two communes was 66.8%, 76.2% in the control communes and 59.0% in the intervention commune in which, a number of people knowing eating fat reduction accounted for the highest proportion (the general percentage in two communes was 19.7%, 22.9% in the control and 18.3% in the intervention commune), the lowest was a measure to avoid nervous tension (the general percentage in two communes 2.7%, 4.8% in the control commune and 1.0% in the intervention commune).

The proportion of study subjects knowing HBP can be preventable and knowing preventive measures in the control was higher than that in the intervention commune and the difference was not statistically significant, with $p < 0,001$ and $p < 0,05$, respectively.



Z test, $p > 0.05$

Figure 3.3. Overall knowledge level on hypertension prevention in study subjects in two communes

Remarks: The proportion of the study subjects with a general knowledge was fair (the general percentage in two communes was 3.2%, 3.3% in the control commune and 3.1% in the intervention commune and was a good level (the general percentage in two communes was 2.0% , 2.0% in the control and 2.0% in the intervention commune), while the proportion of study subjects with a poor general knowledge about hypertension accounted for a high proportion poor (the general percentage in two communes was 90.1%, 89.5% in the control commune and 90.6% in the intervention commune).

Table 3.13. Consumption frequency of some foods at risk for HBP in study subjects in two communes

Name of food	Control commune (n = 458)		Intervention commune (n = 551)		p	Control commune (n = 458)		Intervention commune (n = 551)		p
	Eating regularly (Daily, weekly)					Eating a little or not eating				
	n	%	n	%		n	%	n	%	
Oil, butter, fats of animals*	378	82.5	502	91.1	<0.001	80	17.5	49	8.9	< 0.001
Meat and its products*	420	91.7	521	94.6	> 0.05	38	8.3	30	5.4	> 0.05
Fried foods*	317	69.2	450	81.7	<0.001	141	30.8	101	18.3	< 0.001
Salt foods*	276	60.3	301	54.6	> 0.05	182	39.7	250	45.4	> 0.05
Organs of animal*	101	22.1	118	21.4	> 0.05	357	77.9	433	78.6	> 0.05
Sugar and sweets*	113	24.7	206	37.4	<0.001	345	75.3	345	62.6	< 0.001

χ^2 test

Remarks: A number of study subjects regularly eating foods at risk for HBP accounted for a high proportion in both the intervention commune and the control, in which the meat and its products made up the highest proportion (91.7% in the control communes and 94.6% in the intervention commune), followed by a group of oil, butter / animal fat (82.5% in the control and 91.1% in the intervention commune), for fried foods (69.2% in the control and 81.7% in the intervention commune) and the lowest was a group of animal viscera (22.1% in the control and 21.4% in the intervention commune).

The proportion of study subjects regularly eating meat and its products, salty foods and animal viscera was similar in two communes. However, the proportion study subjects regularly eating oils, butter / animal fats, fried foods and sugar / sweets was higher in the intervention control commune. The differences was statistically significant, with $p < 0.001$.

3.2. Effectiveness of nutrition education and communication model to improve some risk factors for hypertension in the community

3.2.1. Results of developing the nutrition education and communication model

The study team has built a network of nutrition education and communications in the intervention areas as follows: Having established the Steering Board at district and commune level based on available resources.

3.2.2. Results of deployment of model

3.2.2.3. Results of training health workers

The participants were trained to improve knowledge on the hypertension prevention, skills including the nutrition education, health counseling skills to improve the risk factors of hypertension for people in the community.

3.2.2.4. Results of nutrition education and communication

The comments from the in-depth interviews, group discussions agreed that the activities of the nutrition education was appropriate and accepted by people.

3.2.2.5. Results of ability to maintain and replicate the communication activities

After the intervention, the study subjects said that the communication activities should be maintained and replicated.

3.2.3. Effectiveness to improve some risk factors for hypertension of nutrition education and communication model in the community at An Lao commune in Binh Luc district , Ha Nam province

*** Changes in knowledge about hypertension values myself, the concepts, signs and consequences of hypertensive in the study subjects**

Before the intervention, the proportion of subjects knowing about their blood pressure readings was not significantly different ($p > 0.05$). However, after the intervention, the proportion increased in both communes but in the intervention commune, this rate (21.4%) was higher than that in the control commune (16.4%) and increased as compared to before the intervention (13.2%), the difference was statistically significant with $p < 0.05$ and the effectiveness of intervention was 27.0%. Before the intervention, the percentage of subjects correctly understanding the concept of hypertension and knowing the signs of hypertension and the consequences of hypertension in the control commune and the intervention commune was similar. After intervention: In the control commune, the percentage of study subjects correctly understanding the concept of hypertension and knowing the signs of hypertension and consequences of hypertension increased not significantly as compared to before the-intervention. In the intervention commune, the percentage of study subjects correctly understanding the concept of hypertension after intervention (58.3%) was significantly higher than before intervention (13.2%) and compared to the control commune (18.3 %). The effectiveness of intervention reached 335.2%. The percentage of study subjects knowing the signs of hypertension in the intervention commune was higher than before the intervention and compared to the control commune, the difference was statistically significant with $p < 0.05$ and $p < 0.001$, respectively. %). The effectiveness of intervention reached from 21.6% - 893.4% depending on the signs of hypertension. The proportion of study subjects knowing the consequences of hypertension in the intervention commune was significantly higher than that in the control commune. The difference was statistically significant with $p < 0.001$. The effectiveness of intervention reached from 22.7% - 255.1% depending on the signs of hypertension.

Table 3.20. Changes in knowledge on hypertension prevention measures

Possible prevention and preventive measure	Control commune				Intervention commune				P _{1,3}	P _{2,4}	Effectiveness of intervention (%)
	Pre-intervention (1) (n=458)		Post-intervention (2) (n=458)		Pre-intervention (3) (n=551)		Post-intervention (4) (n=551)				
	n	%	n	%	n	%	n	%			
Knowing HBP is preventable	349	76,2	382	83,4	325	59,0	504	91,5	<0,001	<0,001	45,7
Knowing preventive measures											
Eating fat reduction*	105	22,9	114	24,9	94	18,3	417	75,7	<0,05	<0,001	304,9
Eating salt reduction*	74	16,2	90	19,7	23	4,5	393	71,3	<0,05	<0,001	146,3
Eating sugar reduction*	37	8,1	41	9,0	15	2,9	232	42,1	<0,05	<0,001	134,6
Eating more vegetables /fruits*	68	14,8	74	16,2	45	8,8	434	78,8	<0,05	<0,001	786,0
Not drinking alcohol/beer*	95	20,7	97	21,2	51	9,9	439	79,7	<0,05	<0,001	702,6
No smoking*	46	10,0	49	10,7	22	4,3	395	71,7	<0,05	<0,001	156,4
Weight loss*	24	5,2	27	5,9	14	2,7	282	51,2	<0,05	<0,001	178,3
Avoiding nervous tensions*	22	4,8	25	5,5	5	1,0	212	38,5	<0,001	<0,001	373,5
Strengthening sports*	75	16,4	84	18,3	55	10,7	374	67,9	<0,05	<0,001	523,0

* χ^2 test

Remarks: The percentage of study subjects knowing the preventable hypertension and knowing the preventive measures in the control commune was higher than that in the intervention commune, and the difference was statistically significant with $p < 0.001$ and $p < 0,05$ respectively. However, after a year, this rate increased not significantly as compared to pre-intervention. After the intervention, the percentage of study subjects knowing a preventable hypertension and knowing the preventive measures in the intervention commune (91.5%) increased significantly as compared to before the intervention (59.0%). After the intervention, this percentage in the intervention commune also increased significantly as compared to the control. The difference was statistically significant with $p < 0.001$. The effectiveness of intervention reached 45.7% - 786.0% depending on the hypertension prevention measures.

Table 3.26. Changes in risk factors for hypertension in two communes

Risk factor	Control commune				Intervention commune				P _{1,3}	P _{2,4}	Effectiveness of intervention (%)
	Pre-intervention (1) (n=458)		Post-intervention (2) (n=458)		Pre-intervention (3) (n=458)		Post-intervention (4) (n=551)				
	n	%	n	%	n	%	n	%			
Smoking*	310	67,7	246	53,7	347	63,0	145	26,3	>0,05	<0,001	37,6
Drinking alcohol/beer*	119	26,0	86	18,8	115	20,9	80	14,5	>0,05	>0,05	2,9
Salty eating*	108	23,6	97	21,2	122	22,1	62	11,3	>0,05	<0,001	38,7
Overweight, obesity (BMI ≥ 25)*	31	6,8	29	6,3	28	5,1	18	3,3	>0,05	<0,05	27,9
Eating vegetables, fruits*	272	59,4	243	53,1	337	61,2	167	30,3	> 0,05	<0,001	39,9
Physical inactivity	255	55,7	201	43,9	292	53,0	146	22,9	>0,05	<0,001	35,6

* χ^2 test

Remarks: Before the intervention, the percentage of a number of risk factors in the intervention commune and the control was not significantly different ($p > 0.05$). After the intervention, risk factors including smoking; eating less vegetables and fruits; physical inactivity; salty eating and overweight, obesity in the intervention commune significantly reduced as compared to pre-intervention and compared to the control commune and the difference was statistically significant with $p < 0.05$ and $p < 0.001$, respectively. The effectiveness of intervention with vegetables and fruits reached the highest (39.9%), with dinking alcohol/beer was the lowest (2.9%), $p > 0.05$. After the intervention, a number of study subjects eating the food at risk of hypertension in the intervention commune reduced significantly as compared to the control, especially reduced most markedly in a group of oil, butter and animal fats (77,0% in the intervention commune vs 97,8% in the control), followed by salty foods (54.1% in the intervention vs 31.1% in the control).

Table 3.29. Average consumption of some foods every day contributing to the hypertension prevention in study subjects

Name of food		Control commune (n = 458)	Intervention commune (n = 551)	p
		($\bar{X} \pm SD$)	($\bar{X} \pm SD$)	
Fruit (g/day)*	Pre-intervention	150.4 ± 108.4	149.3 ± 194.1	> 0.05
	Post-intervention	192.6 ± 149.2	315.1 ± 149.2	< 0.05
	p	> 0.05	< 0.05	
Vegetable (g/day)*	Pre-intervention	334.3 ± 215.8	322.3 ± 208.3	> 0.05
	Post-intervention	343.9 ± 177.0	381.01 ± 194.2	< 0.05
	p	> 0.05	< 0.05	
Tuber and fruit used as vegetable (g/day)*	Pre-intervention	138.3 ± 186.1	97.3 ± 140.0	> 0.05
	Post-intervention	119.6 ± 245.9	145.3 ± 106.9	< 0.05
	p	> 0.05	< 0.05	

Mann - Whitney U test

Remarks: Before the intervention, no differences in fruit and vegetables consumption as well as tuber and fruit used as vegetable between the control and the intervention commune ($p > 0.05$). After the intervention, the average food consumption of foods contributing to the prevention of hypertension increased in the intervention commune as compared to before the intervention and to the control commune, in which the amount of food consumed much most was green vegetables (381.01 ± 194.2 before intervention compared to after intervention 322.3 ± 208.3). The difference was statistically significant with $p < 0.05$.

Table 3.35. Changes in prevalence of hypertension in study subjects

Situation of hypertension		Control commune				Intervention commune				p _{1,3}	p _{2,4}	Effectiveness of intervention (%)
		Pre-intervention (1) (n=458)		Post-intervention (2) (n=458)		Pre-intervention (3) (n=551)		Post-intervention (4) (n=551)				
		Amount	%	Amount	%	Amount	%	Amount	%			
Hypertension*		128	27.9	130	28.4	118	21.4	106	19.2	<0.05	<0.05	12.1
Type of HBP*	Systolic HBP	116	25.3	107	23.4	105	19.1	96	17.4	<0.05	<0.05	1.4
	Diastolic HBP	57	12.4	55	12.0	66	12.0	66	12.0	>0.05	>0.05	- 3.2
	Systolic HP and diastolic HBP	45	9.8	43	9.4	53	9.6	47	8.5	>0.05	>0.05	7.4
Grade HBP*	Grade I hypertension	92	20.1	92	20.1	79	14.3	78	14.2	<0.05	<0.05	0.7
	Grade II hypertension	24	5.2	28	6.1	26	4.7	17	3.1	>0.05	<0.05	16.7
	Grade III hypertension	12	2.6	10	2.2	13	2.4	11	2.0	>0.05	>0.05	1.3

* χ^2 test

Remarks:

Before the intervention, the prevalence of diastolic HBP and systolic HBP, grade II and III hypertension in the intervention commune and the control was not different.

The overall prevalence rate of hypertension in the control (27.9%) was higher than that in the intervention commune (21.4%), the prevalence rate of systolic HBP in the control (25.3%) was higher than that in the intervention commune (19.1%) and the rate of Grade I hypertension in the control (20.1%) was higher than that in the intervention commune (14.3%). The difference was not statistically significant, with $p > 0.05$. After the intervention, the overall prevalence rate of hypertension in the control increased by 0.5% as compared to before the intervention (27.9% before the intervention vs 28.4% after the intervention). While after the intervention, the prevalence rate of hypertension in the intervention commune decreased by 2.2% (from 21.4% before the intervention to 19.2% after the intervention). The difference in the prevalence of hypertension after the intervention in the intervention commune was statistically significant as compared to the control, with $p < 0.05$; the effectiveness of intervention was 12.1%. The prevalence of systolic, diastolic HBP, combining systolic HBP and diastolic HBP dropped as compared to pre-intervention in both the control and intervention commune but not much. After the intervention in the intervention commune: The prevalence of Grade I and Grade III hypertension decreased as compared to before the intervention but the difference was not statistically significant, with $p > 0.05$. The prevalence rate of Grade II hypertension decreased most (down 1.6% compared to pre-intervention) and dropped much more as compared to the control (down 0.4%), the difference was statistically significant, with $p < 0, 05$, the effectiveness of interventions was 16.7%.

Chapter 4. DISCUSSIONS

4.1. Situation of hypertension, some risk factors and knowledge, practice on hypertension prevention

4.1.2. Situation of hypertension in adults at 2 communes in Binh Luc district, Ha Nam province

The general prevalence rate of hypertension in adults in two commune in our study in Table 3.3 was 24.4%, this result was higher than the findings in a study by Lai Duc Truong (2011) and Tran Thi Mai Hoa (2014). However, our results was lower than the survey results by the Central Institute of Cardiology (2008) and the results of Do Thi Phuong Ha (2015).

4.1.3. Some risk factors for hypertension among adults at 2 communes in Binh Luc district

The percentage of some risk factors for hypertension in study subjects in 2 communes was rather high, in which the risk of eating less fruit and vegetables (<400g/day) accounted for the highest percentage (the general rate in 2 communes was 89.5%, 89.7% in the control and 89.3% in the intervention commune) (Table 3.3). Results from STEPS s (2010) also showed that 80.4% of adults ate less vegetables and fruits, in which the proportion of eating less vegetables and fruits in women and men was similar. According to a census of the National Institute of Nutrition (2010), showed that the average consumption of fruits and vegetables was 250g/person/day. A study by Lai Duc Tuong (2011) in Thai Nguyen also showed that the percentage of eating enough vegetables daily as recommended only was 29.0% in men and 22.4% in women. The general percentage of eating salt in 2 communes was 22.8%, 23.6% in the control and 21.1% in the intervention commune (Table 3.4).

The daily salt consumption is an important factor affecting the level of blood pressure and as well as cardiovascular risk. WHO recommended no using more than 5 grams of salt per day to prevent cardiovascular diseases. The prevalence of overweight, obesity in our study subjects accounted for the lowest percentage in the risk factors of hypertension (the general prevalence of overweight, obesity in 2 communes was 5.8%, 6.8%, in the control and 5.1% in the intervention commune (Table 3.4). Our results were much lower as compared to results in a study by Lai Duc Tuong (2011), the prevalence of overweight and obesity in adults aged 25-64 years was 16.5%.

4.2. Effectiveness of nutrition education and communication model to improve some risk factors for hypertension in the community

**** Changes in knowledge, practice on hypertension in study subjects:***

After a year of the intervention, the proportion of study subjects knowing their blood pressure values increased in both 2 communes but in the intervention commune (21.4%) increased much more as compared to that in the control (16.4%) and increased remarkably as compared to before the intervention (13.2%), the difference was statistically significant, with $p < 0.05$ and the effectiveness of interventions reached 27.0%. So after a year of intervention, the study subjects were consciously concerned with health care of themselves. It is necessary to health facilities for medical check and blood pressure readings, simultaneously combined with home blood pressure monitoring by measuring blood pressure.

The proportion of the study subjects with a general knowledge was fair (the general percentage in two communes was 3.2%, 3.3% in the control commune

and 3.1% in the intervention commune and was a good level (the general percentage in two communes was 2.0% , 2.0% in the control and 2.0% in the intervention commune).

In the intervention commune, the proportion of study subjects with a general knowledge about hypertension were fair, good (17.6% and 15.4%) increased more than before the intervention (3.1% and 2.2 %) and compared to control communes (4.1% and 3.3%). The effectiveness of intervention to general knowledge about hypertension with fair, good were 443.5%, and 535.0%. Proportion of study subjects with general knowledge about the poor level of hypertension significantly reduced in social intervention (from 90.6% to 43.0%) and lower than control commune (from 89.5% down 85.6%), the difference was statistically significant with $p < 0.001$ (Table 3.22). This result is consistent with the results of research of Nguyen Lan Viet (2008).

After the intervention, the percentage of risk factors including smoking; salty eating and overweight, obesity in the intervention commune significantly reduced as compared to pre-intervention and compared to the control communes, the difference was statistically significant with $p < 0.05$ and $p < 0.001$, respectively. The effectiveness reached 27.9%, 37.6% and 41.6%, respectively. Particularly the percentage of people drinking alcohol/beer reduced in the intervention commune as compared to before the intervention and the control, however, the difference was not statistically significant with $p > 0.05$, the effectiveness of interventions reached only 2,9% (Table 3.26). Our results were consistent with results by Lai Duc Truong (2011) conducted in two communes in Dong Hy district, Thai Nguyen.

The prevalence rate of Grade II hypertension dropped much most: in the intervention commune, after the intervention, this proportion decreased by 1.6% as compared to pre-intervention and reduced much more as compared to the control (0.4%), the difference was statistically significant with $p < 0.05$, the effectiveness of interventions was 16.7%. The prevalence rate of Grade I and III hypertension in the intervention commune dropped as compared to pre-intervention, but not significantly (Table 3.35). This result showed that there had been a shift from the serious grade hypertension to moderate grade. The prevalence of Grade I hypertension decreased, but not much, this could explain that the activities of nutrition education and communication had helped control the severe grade hypertension and maintain the mild grade hypertension and it could prevent the complications of hypertension. Our results were consistent with the findings by Nguyen Lan Viet (2008), Lai Duc Truong (2011) and Nguyen Kim Ke (2013) on the shift from severe hypertension to more mild hypertension.

CONCLUSSION

1. Situation of hypertension, some risk factors and knowledge, practice on prevention of hypertension in adults in An Lao and Don Xa commune in Binh Luc district, Ha Nam province

1.1. Situation of hypertension and some risk factors

- The general prevalence rate of hypertension in adults in two communes was relatively (24.4%), in the control commune (27.9%) higher than the intervention (21.4%).

- The proportion of a number of risk factors for hypertension in the study subjects was rather high, in which smoking accounted for the highest proportion (the general percentage in 2 communes was 65.1%, 67.7% in the control and 63.0%) in the intervention commune, the lowest percentage was overweight, obesity (the general percentage in 2 communes was 5.8%, 6.8% in the control and 5.1% in the intervention commune). No difference in the proportion of risk factors between the two communes.

1.2. Situation of knowledge, practice on prevention of hypertension

- The study subjects with a general knowledge of hypertension prevention was fair and good (the general percentage in 2 communes was 3.2%, 3.3% in the control and 3.1% in the intervention commune)

- The frequency of food consumption at risk for hypertension in study subjects was rather high both the control and intervention commune in which the highest proportion was meat and its products (91.7% in the control and 94.6% in the intervention commune), the lowest proportion was animal viscera (22.1% in the control and 21.4% in the intervention commune).

2. Effectiveness of the nutrition education and communication to improve some risk factors for hypertension in the community

- The percentage of subjects with a general knowledge about hypertension reached a fair and good level (17.6% and 15.4%, respectively) increased more as compared to before the intervention (3.1% and 2.2%, respectively) and compared with the control (4.1% and 3.3%, respectively).

- The percentage of subjects with a general knowledge about hypertension in a poor level significantly reduced in the intervention commune (from 90.6% to 43.0%) and dropped much more as compared to the control (from 89.5% to 85.6%), $p < 0.001$.

- The frequency of food consumption with the risk for hypertension in intervention commune dropped much more as compared to before the intervention and the control, which is the largest decline was oil and butter, animal fats (from 91.1% before the intervention to 77.0% in the intervention commune).

- The average consumption of foods contributing to the prevention of hypertension increased in the intervention commune as compared to before the intervention and compared to the control, in which the green vegetables increased much most (381.01 ± 194.2 before intervention and 322.3 ± 208.3 after intervention), $p < 0.05$.

- The time of physical activity (at least 30 minutes / day) in the form of household chores, running, walking, cycling increased in the intervention commune as compared to before the intervention and significantly increased as compared to the control, the difference was statistically significant with $p < 0.05$ and $p < 0.001$, respectively. The effectiveness of interventions reached 40.0%, 44.3%, 45.8%, 157.1%, respectively.

- The percentage of risk factors including smoking; salty eating and overweight and obesity in the intervention commune significantly reduced as compared to pre-intervention and compared to the control. The difference was statistically significant with $p < 0.05$ and $p < 0.001$, respectively. The effectiveness of intervention reached 27.9%, 37.6% and 41.6%, respectively.

RECOMMENDATIONS

1. Strengthen the nutrition education and communication on the mass media about the risk factors, consequences of hypertension towards health and measures of hypertension prevention at the community.

2. The authority of An Lao commune should continue to supply concrete guidance to strengthen the coordination of departments, unions to maintain and replicate the intervention results achieved in the commune.

3. Health workers in An Lao commune should continue to strengthen the implementation of integrated operations of the nutrition education and communication aiming at strengthening control hypertension.

4. Binh Luc District Health Centre should plan to continue to support the CHC in maintaining operations of the nutrition education and communication in An Lao and expand operations of the nutrition education and communication into other communes in Binh Luc district.

THE LIST OF PAPERS PUBLISHED RELATED TO THE THESIS

1. Truong Thi Thuy Duong, Le Thi Huong, Le Thi Tai, Nguyen Van Hien (2014), “Hypertension and risk factors among adults in 2 communes of Binh Luc District, Ha Nam province”, *Journal of Medical Research*, 88(3), pp. 143 - 150.
2. Truong Thi Thuy Duong, Le Thi Huong, Le Thi Tai, Nguyen Van Hien (2015), “Knowledge and practice on hypertension among adults at two communes of Binh Luc district, Ha Nam province”, *Journal of Preventive Medicine, Volume XXV*, No.6 (166), pp.174 - 181.
3. Truong Thi Thuy Duong, Le Thi Huong, Le Thi Tai, Nguyen Van Hien (2016), “Effectiveness of nutrition education and communication model to improve some risk factors for hypertension in among adults at Binh Luc district, Ha Nam province”, *Journal of Practical Medicine*, No.6 (1013), pp. 115 - 117.