Health Education and Hypertension Prevention Behaviour

Ratna Indriawati
Faculty of Medicine and Health Science, Universitas Muhammadiyah Yogyakarta
Email: ratna.indriawati@umy.ac.id

Introduction

The incidence of hypertension continues to increase every year. There are approximately a billion people with hypertension in the world, while 2/3 of the sufferers are in developing countries. It is estimated that in 2025 29% of adults suffer from hypertension with 8 million deaths every year. The prevention and management of hypertension have become a concern for the people of Indonesia. Because currently not only the elderly or people aged > 40 years but many young adults are also affected by hypertension. Before education about managing hypertension properly, the public must know the dangers of hypertension if it is not handled properly. It is important to do self-care to prevent hypertension, starting with yourself and your family, one of which is the ability to do blood tests independently at home. Prevention of hypertension can be done with a healthy lifestyle, physical activity, maintaining ideal body weight, and consuming nutritious food. Treatment of hypertension refers to diet and medication management, sodium and air treatment, daily weight measurement, regular exercise, and monitoring of signs and symptoms of the disease for complications such as cardiovascular disease and kidney disease.[1 2]

Life behaviors that can prevent hypertension include maintaining a healthy diet, controlling body weight, doing physical activity, not smoking, consuming enough fruits and vegetables, not drinking alcoholic beverages, and controlling stress. Knowledge is a very important domain for the formation of one's behavior. Behavior that is based on knowledge and a positive attitude, the behavior will be positive so that over time it will become a habit and a person's lifestyle. Higher knowledge will lead to better behavior, one way to increase one's knowledge is through health education.[3 4]

Discussion

A. Definition and Classification of Hypertension

Hypertension is a symptom of hemodynamic imbalance in the heart and blood vessels system, whose pathophysiology is multi-factorial.

1. Definition:

Hypertension is an increase in systolic blood pressure exceeding 140 mmHg and diastolic exceeding 90 mmHg after the second measurement over a period of five minutes when conditions are calm. Long-standing elevated blood pressure and elevation can cause kidney damage (kidney failure), coronary and stroke if not done early detection and proper treatment. Uncontrolled blood pressure increases over time. It takes an important role from health workers including doctors from the field of hypertension specialization, the government, the private sector, and the community are also needed to control hypertension.[5 6]

The classification of hypertension is based on the average of two or more precise blood pressure measurements obtained from two or more doctor visits. Classification Blood pressure is divided into four categories, normal, prehypertension, stage 1 hypertension, and stage 2 hypertension. Prehypertension is not a disease but is identified as being able to develop into stage 1 or stage 2 hypertension in the future.

Tabel 1. Classification of blood pressure according to JNC-8

Classification of blood pressure				
Classification	Sistole (mmHg)		Diastole (mmHg)	
Normal	<120	and		<80
Prehipertensi	120-139	or		80-89
Stage 1 hipertensi	140-159	or		90-99
Stage 2 Hipertensi	≥160	or		≥100

Various kinds of blood pressure limits are said to be hypertension. The limits used by WHO are Systolic Blood Pressure > 160 mmHg or Diastolic Blood Pressure > 95 mmHg.[7 8]

B. Etiology and Patophysiology of Hypertension

Most patients with hypertension are unknown. It is classified as primary hypertension. Only a few patients have high blood pressure that causes a specific cause. This patient is classified as having secondary hypertension. More than 90% of patients who have high blood pressure include primary hypertension. While only 10% of patients with high blood pressure, including secondary hypertension. The causes of primary hypertension are strongly influenced by lifestyle, environmental and genetic factors, and this hypertension develops gradually from year to year. The most common cause of secondary hypertension is a disorder in the kidneys, such as chronic kidney failure or renovascular disease. In this type of hypertension, the increase in blood pressure occurs suddenly, and the blood pressure is usually higher than in primary hypertension.[9] [10]

The mechanism of hypertension is through the formation of angiotensin II from angiotensin I by the angiotensin I converting enzyme (ACE). ACE plays an important physiological role in regulating blood pressure. Furthermore, by hormones, renin (produced by the kidneys) will be converted into angiotensin I. By ACE in the lungs, angiotensin I is converted into angiotensin II. Angiotensin II is what has a key role in raising blood pressure through two main actions. The first action is to increase the secretion of antidiuretic hormone (ADH) and thirst. ADH is produced in the hypothalamus (pituitary gland) and acts on the kidneys to regulate osmolality and blood volume. With increased ADH, very little urine is excreted out of the body (antidiuresis), so the urine becomes concentrated and has a high osmolality. Meanwhile, the volume of extracellular fluid continues to increase. As a result, blood volume increases which in turn will increase blood pressure.[11]

The second action is to stimulate aldosterone secretion from the adrenal cortex. Aldosterone is a steroid hormone that has an important role in the kidneys. To regulate the volume of extracellular fluid, aldosterone will reduce the excretion of NaCl (salt) by reabsorbing it from the renal tubules. Increasing the concentration of NaCl in the blood will be diluted again by increasing the volume of extracellular fluid which in turn will increase blood volume and pressure. The pathogenesis of essential hypertension is multifactorial and very complex. These factors alter the function of blood pressure towards adequate tissue perfusion including hormone mediators, vascular activity, circulating blood volume, vascular caliber, blood viscosity, cardiac output, the elasticity of blood vessels, and neural stimulation. The pathogenesis of essential hypertension can be triggered by several factors including genetic factors, salt intake in the diet, and stress levels that can interact to cause symptoms of hypertension. The course of essential hypertension progresses from hypertension which sometimes appears to be persistent hypertension. After a long asymptomatic period, persistent hypertension progresses to complicated hypertension, in which target organ damage occurs in the aorta and small arteries, heart, kidneys, retina, and central nervous system. The progression of hypertension starts from prehypertension in patients aged 10-30 years (with increased cardiac output) then to early hypertension in patients aged 20-40 years (where peripheral resistance increases) then to hypertension at the age of 30-50 years and finally to hypertension with complications. at the age of 40-60 years.[12] [13]

Complications of hypertension can affect the eyes, kidneys, heart, and brain. retinal disorders, visual disturbances to blindness. Heart failure is a disorder that is often found in severe hypertension in addition to coronary and myocardial disorders. In the brain, bleeding is often caused by the rupture of a microaneurysm which can lead to death. Other abnormalities that can occur are thromboembolic processes and transient ischemic attacks (TIA).[11] [14]

C. Health Education

a. Definition of Health Education

Health education is a dynamic behavior change process to change or influence human behavior, which includes components of knowledge, attitudes, or practices related to life goals individually, in groups, or in society and is a component of health programs. According to WHO, Health Education is a process by which individuals improve their health. Health education is a behavior change process that requires awareness from within the individual, group, or society itself.[15]

b. Scope of Health Education

The scope of health education can be seen from various dimensions, including the dimensions of education, the dimensions of the place of implementation or application, and the dimensions of the level of health services. From the dimensions of the target, health education can be divided into 3, including:

1. Individual health education with individual targets.
2. Group health education with group targets.
3. Public health education targeting the more expansive community

Dimensions of the place of implementation, health education can take place in various places, by itself the targets are different, for example:

1. Health education in schools, carried out in schools with student targets.
2. Health education in hospitals, carried out in hospitals targeting patients or their families, primary health care, and so on.
3. Health education in the workplace with the target of the workers or employees concerned.[15] [16]

Dimensions of the level of health services, health education can be carried out based on five levels of prevention (Leavel and Clark), as follows:

1. Health Promotion

At this level, health education is needed for example in improving nutrition, living habits, improving environmental sanitation, personal hygiene, and so on.

2. Special Protection (Specific Protection)

In the education program as a form of special protection services, it is very necessary, especially in developing countries. This is because public awareness about the importance of immunization as a protection against disease in himself and in children is still low.

3. Early Diagnosis and Immediate Treatment (Early Diagnosis and Immediate Treatment)

Due to the low level of public knowledge and awareness of health and health, it is difficult to detect diseases that occur in the community, and sometimes people find it difficult or unwilling to have their disease checked and treated. This causes people to not get proper health services. Therefore, health education is very necessary at this stage.

4. Disability Limitation (Disability Limitation)

Due to the lack of public understanding and awareness about health and health, people often do not continue their treatment to completion. In other words, they do not carry out a complete examination and treatment of the disease. Improper and perfect treatment can result in the person concerned being disabled or incapacitated.

5. Rehabilitation (Rehabilitation)

After recovering from a certain disease, sometimes people become disabled. Finding the defects sometimes required certain exercises. Due to a lack of understanding and awareness of the person, he does not or does the preferred exercises. In addition, people with disabilities after recovering from illness are sometimes embarrassed to return to society.[15] [17]

c. The role of health education

All public health experts in discussing health status refer to H. L. Blum. From the results of his research in the United States as one of the developed countries, Blum concluded that the environment has and is the greatest for health status. Then followed by behavior that has the second share, health services, and offspring.[1] [5]

d. Health Education Media Through Audiovisual

Health education media is a tool used to convey information and convenience to the public or health education subjects who receive messages conveyed by health education providers. Based on its function as a distributor of health education media messages, it is divided into three namely: print media, electronic media, and outdoor media. Audiovisual media is a modern instructional media that is in accordance with the times (science and technology advances). Audiovisual media can be used for entertainment and communication purposes. In addition, this media can be used for educational purposes with easier materials.It is explained by the community from children to adults if what is conveyed clearly and in common language is easy to understand by certain groups. Audiovisual media has two characteristics, namely moving and silent audiovisual media. In addition, the types of audiovisual media are divided into two types, namely impure and pure audiovisual media. Pure audiovisual is not pure sound or images that come from one source, while impure audiovisual media is not pure sound and images that come from different sources.[18] [19]

D. Bahavior

a. Typing Behavior

Human behavior is the result of all kinds of experiences and human interactions with the environment that are manifested in the form of knowledge, attitudes, and actions. In

other words, behavior is an individual's response/reaction to stimuli that come from outside or from within himself. This response can be passive (without action: think, argue, or active (take action).[20] [21]

b. Hypertension prevention behavior

Given that hypertension is a disease that does not have specific symptoms or typical symptoms, prevention efforts and early detection are important. The main key to preventing hypertension is to avoid the trigger factors (risk factors). Factors that trigger hypertension are divided into 2, namely: controllable factors such as obesity, lack of exercise, smoking, and consumption of alcohol and salt; and uncontrollable factors such as heredity, gender, and age. can be achieved well by setting a good diet and sufficient physical activity.[13]

Efforts to avoid hypertension are to apply a healthy lifestyle and healthy eating patterns. A healthy lifestyle is meant to do regular physical activity, avoid caffeine, smoking, and various other unhealthy habits and pay attention to the need for sleep at night (good sleep 7-8 hours a day). A healthy eating pattern is to avoid foods that contain high fat, and high calories, use excessive salt or foods that contain high salt and high sugar and pay attention to foods that contain high cholesterol, guard foods, and fried foods. This is important to do to reduce the risk of hypertension and reduce already high blood pressure. Prevention of hypertension can be done by controlling risk factors, including:

1. Control your weight

Controlling weight is an important step to reduce the risk of high blood pressure. Excess weight will make the heart work too much. The best way to control. Weight loss is to reduce foods that contain lots of fat and do exercise regularly. The more weight you lose, the lower your blood pressure will be. Hypertension can occur at a relatively young age if the supporting factors for hypertension have been present from an early age. One of the triggers of hypertension is obesity. In children who are obese, 30% of them develop high blood pressure as adults. Children who often experience high blood pressure, when they grow up to be teenagers, will become hypertensive sufferers. Likewise, teenagers tend to experience high blood pressure. When they grow up, they will suffer from hypertension. The risk is even greater if you have a lineage of people with hypertension. The increase in obesity is allowed to continue until now, then in 2025 it is likely that the Indonesian population will hold the title of obesogenic, especially in urban areas. Child obesity is clearly a serious health problem, not solely because of its cause (30-60%) to adult obesity. Negative impacts on children include hypertension and psychological disorders in the form of side increases as a decrease in the quality of life, increasing the economic burden on the family and the state.[11] [22] [23]

2. increased physical activity

Regular exercise or exercise on a regular basis can lower blood pressure to normal levels and reduce the risk of hypertension by 50% greater than people who are not active in sports. One exercise session on average lowers blood pressure by 5-7 mmHg. This effect on blood pressure can last up to about 20 hours after exercising (Susanto, 2010). Not only programmed exercise but being more active in daily activities also helps a lot in improving muscle performance and the physiological quality of the body. A number of studies say that physical activities such as climbing stairs, gardening, and doing household tasks are proven to be effective in helping control blood pressure. Getting used to living static, and being lazy to do physical activity is a bad habit that opens wide opportunities for suffering from hypertension. The ratio between muscle and fat is high due to less physical activity is the main reason for hypertension. In addition, rarely moving makes the heart muscle weak, and blood vessels blood is stiff and blood circulation is blocked so that the blood tends to clot and cause hypertension. Efforts to prevent hypertension will be optimal if physical activity is accompanied by a healthy diet and quitting smoking[22].[24]

3. Reduce salt intake

High salt consumption with the occurrence of essential hypertension, can be seen in epidemiological studies of blood pressure with high salt consumption. However, since most of them did not suffer from hypertension, there was a difference in sensitivity to salt. A salt/sodium-sensitive blood pressure response was defined as an increase in mean arterial blood pressure of = 5 mmHg after 2 weeks of high salt consumption. The people who consume 5 grams of salt per day will increase the risk of essential hypertension by 9.8 times compared to people who consume < 5 grams of salt per day.[13]

4. start smoking

Smoking is one of the causes of hypertension. Cigarettes smoked can cause an increase in blood pressure. Smoking will cause vasoconstriction of blood vessels peripheral and renal vessels, resulting in an increase in blood pressure. stopping one bar daily will increase your

systolic pressure by 10-25 mmHg and increase your heart rate by 5-20 beats per minute. Activated actively or passively basically the presence of CO (carbon monoxide) is detrimental, which causes the supply of oxygen to the tissues to decrease. Body cells that are deprived of oxygen will try to meet oxygen through compensating blood vessels by constricting or spasming and triggering blood pressure. If the spasm process lasts a long time and continuously, the blood vessels will be damaged by the atherosclerotic process.[25]

5. Foods high in fiber

Foods that contain lots of fiber are very important for the balance of cholesterol levels. Fiber is found in plants, especially in vegetables, fruit, grains, nuts, and seeds. Besides being able to lower cholesterol levels because it is useful for transporting bile acids, it can also regulate blood sugar levels and lower blood pressure. Fruits are very good for fighting hypertension. By consuming fresh fruits and vegetables regularly, you can lower high blood pressure. Apart from lowering the pressure blood, eating fresh fruits and vegetables regularly can also prevent other diseases caused by free radicals. The fruit that is often consumed to treat hypertension is bananas. In general, the nutritional content contained in ripe bananas is considered good enough to treat hypertension.[26]

6. Control stress

Stress is the body's reaction to situations that seem dangerous or difficult. Stress is the main trigger for high blood pressure among young executives. In some young executives, stress is exacerbated by smoking, drinking coffee, and eating an unhealthy diet. The work environment and workload that are not conducive have the potential to support the birth of high blood pressure. Stress in patients with essential hypertension is a factor that is considered the most instrumental in building physical so that it can prevent hypertension experienced. When the condition of hypertension worsens, it can increase the risk of hypertension sufferers suffering from stroke, heart disease, kidney failure, blindness, and others.[27] [28]

Conclusion

The provision of health education can influence hypertension prevention behavior. Absorption of information and knowledge that can affect hypertension prevention behavior.

References

1. Pettey CM, Mcsweeney JC, Stewart KE, Price ET, Heo S, Souder E. hypertension. 2016;14(1):8–15.
2. Judd E, Calhoun DA. Apparent and true resistant hypertension: Definition, prevalence and outcomes. J Hum Hypertens. 2014;28(8):463–8.
3. Larson LM, Martorell R, Bauer PJ. A Path Analysis of Nutrition, Stimulation, and Child Development Among Young Children in Bihar, India. Child Dev. 2018;89(5):1871–86.
4. Ahun MN, Aboud FE, Aryeetey R, Colecraft E, Marquis GS. Child development in rural Ghana: Associations between cognitive/language milestones and indicators of nutrition and stimulation of children under two years of age. Can J Public Heal. 2017;108(5–6):e578–85.
5. Cheng A, Kessler D, Mackinnon R, Chang TP, Nadkarni VM, Hunt EA, et al. Conducting multicenter research in healthcare simulation: Lessons learned from the INSPIRE network. Adv Simul. 2017;2(1):1–14.
6. Oliveras A, De La Sierra A. Resistant hypertension: Patient characteristics, risk factors, co-morbidities and outcomes. J Hum Hypertens. 2014;28(4):213–7.
7. Naseem R, Adam AM, Khan F, Dossal A, Khan I, Khan A, et al. Prevalence and characteristics of resistant hypertensive patients in an Asian population. Indian Heart J [Internet]. 2017;69(4):442–6. Available from: http://dx.doi.org/10.1016/j.ihj.2017.01.012
8. Galán I, Verdalles Ú, García de Vinuesa M, Quiroga B, Goicoechea M, Pérez A, et al. Impacto de la aplicación del 8.o JNC y de las guías KDIGO-2013 en el control de la hipertensión arterial y los lípidos en una consulta de Nefrología. Nefrologia. 2018;38(4):379–85.
9. Chen J, Liao Y, Li Z, Tian Y, Yang S, He C, et al. Determinants of salt-restriction-spoon using behavior in China: Application of the health belief model. PLoS One. 2013;8(12):4–12.
10. Indriawati R, Syaifudin S. Relationship between Demographic Factors and Body Mass Index with the Prevention of Hypertension in Adolescents. J Heal Promot Behav.

2020;5(2):72–8.
11. Samadian F, Dalili N, Jamalian A. Lifestyle modifications to prevent and control hypertension. Iran J Kidney Dis. 2016;10(5):237–63.
12. Boateng D, Wekesah F, Browne JL, Agyemang C, Agyei-Baffour P, De-Graft Aikins A, et al. Knowledge and awareness of and perception towards cardiovascular disease risk in sub-Saharan Africa: A systematic review. PLoS One. 2017;12(12):1–21.
13. Lu Y, Chen R, Cai J, Huang Z, Yuan H. The management of hypertension in women planning for pregnancy. Br Med Bull. 2018;128(1):75–84.
14. Van Zant SR, Jo Cape K, Roach K, Sweeney J. Physical Therapists' Perceptions of Knowledge and Clinical Behavior Regarding Cardiovascular Disease Prevention. Cardiopulm Phys Ther J. 2013;24(2):18–26.
15. Machado AP, Lima BM, Laureano MG, Silva PHB, Tardin GP, Reis PS, et al. Educational strategies for the prevention of diabetes, hypertension, and obesity. Rev Assoc Med Bras. 2016;62(8):800–8.
16. De Jong LD, Francis-Coad J, Wortham C, Haines TP, Skelton DA, Weselman T, et al. Evaluating audio-visual falls prevention messages with community-dwelling older people using a World Café forum approach. BMC Geriatr. 2019;19(1):1–11.
17. Holmes NG, Olsen J, Thomas JL, Wieman CE. Value added or misattributed? A multi-institution study on the educational benefit of labs for reinforcing physics content. Phys Rev Phys Educ Res. 2017;13(1):1–12.
18. Goossens S, Senny F, Lee JA, Janssens G, Geets X. Assessment of tumor motion reproducibility with audio-visual coaching through successive 4D CT sessions. J Appl Clin Med Phys. 2014;15(1):47–56.
19. Indriawati R, Usman S. Pemberdayaan Masyarakat sebagai Upaya Deteksi Dini Faktor Risiko Hipertensi. J Surya Masy. 2018;1(1):59.
20. Chung LMY, Fong SSM. Role of behavioural feedback in nutrition education for enhancing nutrition knowledge and improving nutritional behaviour among adolescents. Asia Pac J Clin Nutr. 2018;27(2):466–72.
21. Indriawati R, Darmawati I. Peingkatan Pengetahuan Perilaku Hidup Bersih dan Sehat di Era Covid-19. 2021;5(2):458–65.
22. Hills AP, Andersen LB, Byrne NM. Physical activity and obesity in children. Br J Sports Med. 2011;45(11):866–70.
23. Caesarianna D, Indriawati R. Obesitas Hubungannya dengan Pola Asuh dan Tingkat Penghasilan Orang Tua pada Kelompok Usia 11-13 Tahun. Mutiara Med J Kedokt dan Kesehat [Internet]. 2016;7(2 (s)):82–7. Available from: http://journal.umy.ac.id/index.php/mm/article/view/1660/1704
24. Zurita-Ortega F, CastrO-sánCheZ M, rOdrígueZ-FernándeZ sOnia, COFré-BOladós C, ChaCón-CuBerOs raMón, MartíneZ-MartíneZ asunCión, et al. Actividad física, obesidad y autoestima en escolares chilenos: Análisis mediante ecuaciones estructurales Physical activity, obesity and self-esteem in chilean schoolchildren. artículo Investig rev Med chile. 2017;145:327–34.
25. Hyland A, Kasza KA, Borek N, Kimmel HL, Taylor KA, Compton WM, et al. Overview of tobacco use transitions for population health. Tob Control. 2020;29(Suppl 3):S134–8.
26. Pedroza-Tobías A, Hernández-Barrera L, López-Olmedo N, García-Guerra A, Rodríguez-Ramírez S, Ramírez-Silva I, et al. Usual vitamin intakes by Mexican populations. J Nutr. 2016;146(9):1866S-1873S.
27. Indriawati R, Azis MR, Yogyakarta UM. Simple nutrition screening tool (snst) in nutritional assessment as a risk factor for cardiovascular disease in the elderly. 2021;15(2):187–94.
28. Indriawati R, Darmawati I. Promosi Kesehatan Gizi Anak. Pros Semin Nas Progr Pengabdi Masy. 2021;2015–7.