CHAPTER II

LITERATURE REVIEW

2.1 Hypertension problem in Thailand

Hypertension is one of critical health problems. Since there is no warning sign apparent at the initial stage, it is often detected at a later stage when there is already hypertension condition. Treatment helps patients to live longer and lessen chance in developing other related disease. However, neglect of hypertension treatment could result in developing of other co-related diseases and possibly death (Jacob et al., 1991).

Control of high blood pressure (HBP) within a normal level requires responsibility and compliance of patients in self-caring and in therapy courses. That is, patients must comply with dietary and medicine intake instruction and should change their lifestyle as advised by healthcare personal. In addition, approximately half of hypertension patients normally neglected medical treatment in the first year post diagnosed period. It was found that only 20-30 % of patients received medical treatment, therefore, up to 70-80 % were not under treatment (Hanujareonkul et al., 1999).

It was found that most hypertension patients had misunderstanding about causes, symptoms and self-care behavior to prevent other related disease, including dietary control, stress relaxation and exercise. It could be seen that previous health education was typically one-way communication, that is, from a training nurse to patients. There

was a lack of interaction between nurses and patients and among patients themselves and the patients were, therefore, not becoming aware of self-care behavior. For positive and effective change in health behavior of hypertension patients and to prevent other hypertension-related disease, there is a need for new strategies that empower the patients to take care of themselves (Hanujareonkul et al., 1999).

For the situation of hypertension in Thailand, according to the statistics collected by the Office of Policy and Strategy, Ministry of Public Health of Thailand, the numbers of hypertension in-patients nationwide have been increasing every year from year 2001-2005 as shown in table 1.

Table 1: Number of hypertension in-patients nationwide

Year	Number	Ratio
2005	307,671	544.08
2004	265,636	477.35
2003	218,218	389.83
2002	187,612	340.99
2001	156,442	287.49

Source: Ministry of Public Health of Thailand

Hypertension has been ranked in year 2005 as the top 5 (out of 10) IPD illness in Thailand with the ratio of 544.1 per 100,000 population.

Cardiovascular disease is one of the leading causes of death in Thailand. At present, trend of death causes in Thai populations has dramatically changed. There is an increasing incidence of disease related to improper behaviors such as lack of exercise, intake of diets with high fat or cholesterol, and stress. These factors lead to an increasing incidence of cardiovascular disease and hypertension. It was found that death rates caused by cardiovascular disease, cancer, and accidents tend to

continuously rise (Ministry of Public Health, The Office of Health Policy and Planning, 2000; Bureau of Health Policy and Planning, 2002).

The mortality rate caused by hypertension and cerebrovascular diseases during 1988-1993 periods indicated a rapid continuous increase moving from 5th rank to the 4th rank of all causal factors. This record corresponded to phase 1 study of death causes in Thailand conducted by Chuprapawan et al. (2000) in 5 provinces. The results indicated some evidence of death cases caused by non-communicable diseases mainly cancer, HBP, and cerebrovascular disease among the group of working people age of 25-44 years old, while in the older age group of 45-59 years old and the group of 60-74 years old, the first and second major death causes were clearly due to cancer and hypertensive-cerebrovascular disease respectively. For the group of elderly people age 75 years old and above, the first major death cause was due to aging and the second major cause was hypertensive-cerebrovascular disease.

In Thailand, hypertension cases resulting in death were commonly due to developing of cerebrovascular disease or paralysis conditions, rather than causing from heart disease. These unhealthy conditions constitute burden of the family and society as well as burden of health care service system, therefore, hypertension of essential type is considered to be critical issue in Thailand (Chuprapawan et al., 2000).

2.2 Type of hypertension

The World Health Organization has defined hypertension as having blood pressure (BP) greater than 140/90 mmHg. The illness has been further classified as mild, moderate, and severe. Patients with mild hypertension have a diastolic pressure

between 90 and 104 mmHg and those with diastolic pressure between 105 and 114 mmHg are diagnosed as severe hypertension.

Table 2: Severity of hypertension

Level	Systolic (mmHg)	Diastolic (mmHg)
WHO		
Normal	<140	<80
Mild hypertension	140-180	90-105
Mild-borderline	140-160	90-95
Moderate-severe	≥ 180	≥90-95
High systolic pressure	≥140	≥90
High systolic pressure Borderline	140-160	≥90
JNC.V		
Normal	<130	<85
High normal	130-139	85-89
High blood pressure		
Level 1 (mild)	140-159	90-99
Level 2 (moderate)	160-179	100-109
Level 3 (severe)	180-209	110-119
Level 4 (very severe)	≥210	≥120

Source: WHO, 1993 and Joint National Committee, 1993

The diagnosis of hypertension is based on at least three BP measurements, taking one week apart under resting conditions. These measurements are then averaged in order to classify the degree of hypertension. Detailed classification of hypertension by WHO (1993) and Joint National Committee (JNC.V, 1993) is shown in Table 2.

In addition, hypertension can be classified into two types according to its casual factors:

1. **Primary or essential-mild hypertension** accounts for 95% of all hypertension incidences. Causes of this type of hypertension cannot be identified.
2. **Secondary hypertension** is caused by several factors, mostly due to kidney diseases, pituitary diseases, clogging of aorta vessels, HBP in pregnant women, and some types of medications. The secondary hypertension can be curd if its casual factors are resolved. A special diagnosis in some medical centers could identify this type of hypertension to be as high as 35% of total incidence.

2.3 Management of hypertension

Through the immediate goal of treatment for hypertension is to reduce BP level as much as possible and ideally to within the normative range, long-term objective is to reduce the incidence of renal and cardiovascular disease in hypertension patients. The required BP range for adolescent or young patients is between 120/80 and 130/80 mmHg. In elderly patients with both systolic and diastolic hypertension, the target BP is below 140/90 mmHg, where as the target BP of systolic hypertension patients is less than 140 mmHg of systolic pressure (WHO, 1993).

Management of hypertension should be based on global risk assessment considering other concomitant cardio-vascular risk factors. Global risk assessment is an important tool to assist physicians and other health care providers to identify hypertensive individuals who are most likely to benefit from management including pharmacotherapy (Khan et al., 2005).

Treatment for hypertension involves both medication therapy and non-medication approach. The latter is involved with changing of lifestyle of hypertension patients that could help to reduce amount of anti-hypertensive drug intake, lessen drug side effect and reduce the cost. In addition, lifestyle change could reduce the risks of cardiovascular disease. Such non-medication treatment includes weight reduction in overweight patients, control of dietary with high salt, restriction of high calorie and saturated-fat diets, exercise, avoiding smoking and alcohol consumption and finally stress management. Proper practice the above behavior will positively enhance one another, for the maximum result all aspects of lifestyle change should, therefore, be adopted (Everson et al., 1996; August, 2003).

2.3.1 Lifestyle modifications

Increasing evidence suggests that lifestyle modification, previously termed as 'nonpharmacological therapy', is beneficial for both nonhypertensive and hypertensive individuals (Touyz et al., 2004). When applied on a population-wide basis, lifestyle modification has the potential for major benefit beyond lowering BP. In hypertensive patients, lifestyle modification should constitute initial treatment before the commencement of pharmacotherapy and serve as an adjunct to medication in patients already on drug therapy. In highly motivated drug-treated patients who are successful, and maintain lifestyle changes, these therapies could facilitate drug step down and possibly, drug withdrawal. For patients with other cardiovascular risk factors such a hyperlipidemia, obesity and diabetes, lifestyle measures are even more important (August, 2003).

2.3.2 Weight Reduction

Excess body weight-body mass index of 27 or greater, is closely correlated with elevated BP. In overweight patients with hypertension, weight reduction enhances the BP lowering effect of concurrent antihypertensive agents and can significantly reduce concomitant cardiovascular risk factors such as diabetes and dyslipidemia. Patients with hypertension monitored weight reduction program involving caloric restriction, low fat, and increased physical activity. Unfortunately, there are problems in achieving adherence to weight reduction programs and in maintaining weight loss over time, and there is a need to investigate behavioral strategies to improve compliance (Johnston, 1991; Touyz et al., 2004).

2.3.3 Dietary Sodium

Dietary Sodium in the form of sodium chloride or table salt has significant link with HBP level. Restriction of diets with high sodium content can help lessen HBP level. Recommended daily intake of sodium is 2,000mg.or less with maximum of 5g of salt per day (Conlin et al., 2000; He et al., 2002; Hooper et al., 2003).

2.3.4 Potassium, Calcium and Magnesium.

Hypertensive patients or normotensive individuals at increased risk of developing hypertension who are considered salt-sensitive such as those of African descent, people more than 45 years of age, and individuals with impaired renal function or diabetes, should ensure an adequate intake of potassium, calcium and magnesium by consuming a diet which is rich in these micronutrients. Supplementation of potassium, calcium and magnesium is not recommended for the

prevention and treatment of hypertension (Conlin et al., 2000). Individuals who require a diet rich in these cations, but who cannot tolerate or afford this diet, should supplement their diet with potassium to obtain a daily intake of 80 mmol/day (Sacks, 2002; Geleijnse et al., 2003).

2.3.5 Avoid Alcohol Intake

Excessive alcohol intake is an important risk factor for HBP; it can cause resistance to antihypertensive therapy, and is a risk factor for stroke. Hypertensive patients who drink alcohol should be advised to stop drinking. If they insist on continuing to drink they should be advised, in any case, not to consume more than 30 ml of ethanol in men and no more than 15 ml of ethanol in women and light-weight persons (Puddy et al., 1992; Wannamethee & Shaper, 1996). Significant hypertension may develop during an abrupt withdrawal from heavy alcohol consumption but recedes a few days after heavy alcohol consumption is reduced (Xin et al., 2001; Nakanishi et al., 2002; Ohmori et al., 2002).

2.3.6 Avoid Smoking

Cigarette smoking is a powerful risk factor for cardiovascular disease, and avoidance of tobacco in any form is essential. Smokers have 20 times higher risk stroking than non-smokers and normally having HBP. Those who continue to smoke may not receive the full degree of protection against cardiovascular disease from antihypertensive therapy (Asakura & Karino, 1990).

2.3.7 Exercise

Regular aerobic exercise is adequate in achieving at least a moderate level of physical fitness and can enhance weight loss and functional health status and reduce the risk of cardiovascular disease and all cause mortality. Exercises are running, bike riding, swimming, and fast walking. Anaerobic exercise or Isotonic such as weight rising is not appropriate for them and it can increase BP level. Beneficial effects of exercise upon BP level may reflect these changes or may be related to psychological effects since regular exercise is also associated with increased self-efficacy and positive mood states, as well as proving an escape from the experience of daily stresses (Kesaniemi et al., 2001; Rice, 2002).

2.4 Hypertension and Stress

Many people today are asking about the relation between hypertension and stress. Some of them think that over stress can cause hypertension, actually stress is an important risk factor for hypertension this means that it aids and facilitates the appearance of hypertension. HBP can be a very dangerous, and often untreated, symptom of stress. In fact, perhaps 70% of all HBP problems are related to emotional responses to difficult or dangerous situations. When this response becomes habituated by body, the prolonged HBP can lead to long term permanent physical damage such as hardening of the arteries, heart, strokes, liver, or kidney damage. These can be very serious and very scary, but many people do not know they have HBP or do not treat this potential killer disease (Steffen et al., 2001; Macleod et al., 2002).

2.4.1 Stress

From a physiological point of view, stress can be defined as a state of internal imbalance where there is an over activation of the fight-or-flight response. The fight-or-flight response, triggered by a threat to being, is an involuntary physiological response of: increased blood flow, heart rate, BP, breathing rate, and metabolism. This physiological response prepares us for conflict (fight) or escape (flight). Over activation of the flight-or-fight response can be both by degree and/or by duration. Chronic activation of the fight-or-flight response increases risk for hypertension. Hypertension can lead to heart attack or stroke (Davis et al., 2000).

Stress can be negative or positive. Negative stress occurs when people feel out of control or under constant pressure. People may have trouble concentrating on a project. They may feel isolated from others. Family, finances, work, isolation are all common causes of negative stress. The death of a near and dear one can make one feel very stressed out. Positive stress provides us a feeling of excitement and opportunity. People may feel confident when approaching a situation. Among athletes positive stress often helps them perform better in competition than in practice. This positive stress acts as a 'Driving Force'. Other examples of positive stresses may include a new job, marriage, birth of a child, etc.

Stress is also highly individualized. Some people cope well with difficult or tense situations. Others melt under the pressure. What may be a 'stressor' for one person may not cause stress in another. What may be a positive stress for one may be a negative stress for the other and vice versa. Failure in a school examination may be a positive stress for some students. They may take it as a challenge and work hard to get great marks in their next exam (Stress And Hypertension, 2008).

Research has shown no evidence that regular short term increases in BP do any permanent damage to blood vessels or internal organs (Macleod et al., 2002).

Research has shown that long term stress does play a role in the increased risk of primary hypertension, but numerous other factors must also be considered, among them obesity, exercise, smoking, and psychological concerns like depression and anxiety levels. Unless managed, stress is a risk factor for hypertension. Stress control can also make a big difference in lowering HBP. One study, which used a controlled trial of yoga and biofeedback, demonstrated a significant reduction in BP with stress control treatments. Chronic stress exposes body to unhealthy, persistently elevated levels of stress hormones like adrenaline and cortical. Chronic stress can also lead to poor eating habits, alcohol consumption, smoking, and lack of exercise – all of which are risk factors for hypertension. Some common stress warning signs are shown in table 3 (Steffen, 2001; Macleod et al., 2002).

Table 3: Signs of Stress

Physical signs	Dizziness, general aches and pains, grinding teeth, clenched jaws, headaches, indigestion, muscle tension, difficulty sleeping, racing heart, ringing in the ears, stooped posture, sweaty palms, tiredness, exhaustion, trembling, weight gain or loss, upset stomach
Mental signs	Constant worry, difficulty making decisions, forgetfulness, inability to concentrate, lack of creativity, loss of sense of humor, poor memory
Emotional signs	Anger, anxiety, crying, depression, feeling powerless, frequent mood swings, irritability, loneliness, negative thinking, nervousness, sadness
Behavioral signs	Bossiness, compulsive eating, critical attitude of others, explosive actions, frequent job changes, impulsive actions, increased use of alcohol or drugs, withdrawal from relationships or social situations

Source: Macleod et al., 2002

2.4.2 Stress Response

This 'fight' or 'flight' response results from the release of an assortment of hormones that cause body to shift into overdrive. Among them are the hormones, adrenaline and cortisol, which cause heart to beat faster and BP to increase. Other physical changes also occur. More blood and nutrients are sent to brain and muscles and less to skin. That is why a person looks pale during moments of fright or high stress. Body also releases a chemical fibrin that makes blood clot more easily (Davis et al., 2000).

In case of a physical attack this would help slow or stop a bleeding wound. Nervous system also springs into action. Pupils dilate to enhance vision. Facial muscles tense up to make look more intimidating. Perspiration increases to cool body. Body gives out signals to warn when someone is under too much stress. Some people become discouraged, irritable, cynical, emotional or even reclusive. All of these emotions affect thinking capacity, feelings and action. However, sometimes these changes are easily missed because they build up gradually over a long time. Physical symptoms are easily perceived and are difficult to ignore. These include a headache, stomach upsets, insomnia, fatigue, frequent illness. A person may develop nervous habits such as biting his nails, smoking or even drinking alcohol. Some persons may even go into drug abuse and addiction (Stress And Hypertension, 2008).

2.4.3 Stress and Blood Pressure

The hormones Adrenaline and Cortisol released during the period of stress increase BP by bringing about vasoconstriction and increasing the heart rate. The increase in BP caused by stress varies. In some, stress causes only a small increase in

BP. In others stress can produce extreme jumps in BP. Although the effects of stress are usually only temporary, if we experience stress regularly, the increases in BP it produces can, over time, damage our arteries, heart, brain, kidneys and eyes, just as with persistent HBP (Stress And Hypertension, 2008).

2.4.4 Stressors

Stressors are the events or situations that cause stress. Being unprepared to give a presentation at work is an example of a stressor. The situation of being unprepared could make a person develop stress.

Stress affects the body in a variety of ways. For example, stress can reduce enjoyment of an occasion, can cause mood changes, and can cause severe health problems. Over time, stress is related to several chronic medical conditions such as HBP, migraine headaches, and a variety of other medical conditions. Stress can increase the risk of heart disease, hypertension, and even cancer. The good news is that the long-term effects of stress can be halted if a person effectively manages the events and responses to stress (Davis et al., 2000).

2.5 Stress Management

Stress is a feeling of physical or emotional tension and is often a response to change. It is part of everyday life, and individuals react to stress in their own way. Significant emotional stress can cause a specific "fight or flight" response from the body (Slotnick & Sacher, 2007).

Stress can increase BP temporarily. When someone is scared, nervous, or under a tight deadline BP naturally increases. But in most cases once he/she begins to relax,

BP goes back down again. If he/she has HBP, simply reducing stress level may not lower BP. But managing stress is important for other reasons (Stress And Hypertension, 2008).

People can experience either temporary, intense periods of stress (acute stress) or longer, "nagging" periods of stress (chronic stress). The body is designed to deal with acute stress and then return to normal. It is not designed to deal with chronic stress, such as dreading going to work every single day. Overwhelming the body's natural defenses,. chronic stress can increase the risk of a variety of heart-related conditions such as hypertension, or cardiac events such as heart attack or stroke. Frequent or lasting periods of significant emotional stress have also been associated with an increased risk of abnormal heart rhythms and higher levels of cholesterol (Kabat-Zinn, 1990; Greenberg, 2003).

Heart patients are especially encouraged to learn stress management techniques. **Stress management refers to a strategy of controlling stress and reducing its impact.** Adopting appropriate coping mechanisms can relieve stress in a healthy, productive way. The American Heart Association emphasizes that outside events are less important than how individuals react to them. Studies show that heart patients can reduce their risk of a cardiac event by up to 75 percent by using healthy **stress management techniques**, including learning to:

- **Relax in a healthy way.** Healthy strategies include relaxation, meditation or breathing exercises. Unhealthy strategies include excessive alcohol use, drug use and verbal/physical abuse.

- **Identify the problem.** Many people are often not aware of the reason for their feeling tense or stressed. Identifying the problem is essential to keep it from happening over and over again in the future.
- **Address the problem.** Sometimes addressing a problem means making a change, and sometimes it means accepting the situation as out of one's control without stressing about it any further (Slotnick & Sacher, 2007).

With practice, these stress management techniques help people to gain control over stress, instead of allowing stress to gain control over them. Most physicians are reluctant to prescribe medications to treat stress, because many of these medications tend to be addictive. Therefore, people are urged to take the time to learn and practice **healthy stress management strategies** to improve their physical and emotional health.

Stress management includes all aspects of your life: physical, emotional and behavioral well-being, nutrition, exercise, the amount and quality of sleep you get leisure activities, coping skills, communication skills, relationship management and so on. More and more research is showing that stress management can help prevent heart disease and help heart patients recover. Stress management also includes changing the perception of stress. A large amount of the stress people encounter is self-generated; that is, the way individuals perceive or think about a situation or event affects how much stress they feel (Herbert, 1997; Slotnick & Sacher, 2007; Stress And Hypertension, 2008).

To manage stress, two things may be done. It may be done by either changing the source of stress or changing one's reactions to it. In doing the former, it's like totally quitting the status quo. It's like giving up totally so that the stress factor that is

present in life is totally eliminated. Some see this as chickening out or being yellow. However, this is also relative for the individual because if the stress factor already affects every aspect of the life of the individual, getting out of the situation completely may be the best option. This may also be considered a brave move. The second option takes a lot of courage and maturity. Being able to identify and practice appropriate reactions to stressful situations takes a lot of courage and wisdom (Dedrick, 2006).

The best way to manage stress is to first become aware of the stressors and to observe individual's emotion and physical reactions to them. The next stress management technique is by reducing the intensity of emotional reaction to stress. The worriers most likely chicken out. Sometimes perception of the stress factor is exaggerated. It's like making a mountain out of a mole. It is best to work at adopting moderate views. Positive thinkers achieve more than the negative thinkers. It is best to build physical reserves to be able to manage stress. The usual exercise is needed for cardiovascular fitness at least done three to four times a week. Live a healthy lifestyle because this will be the best armor in fighting the daily struggle of life (Dedrick, 2006).

There are different strategies for managing stress (Kabat-Zinn, 1990; Greenberg, 2003; Slotnick & Sacher, 2007).

2.5.1 Relaxation / Self-regulation techniques

Relaxation / Self-regulation techniques counteract the over activation of the fight-or-flight response. Whereas the fight-or-flight response includes increased blood flow, heart rate, BP, breathing rate, and metabolism, the relaxation response

includes decreased heart rate, BP, breathing rate, and metabolism. Also, whereas blood flow, heart rate, BP, breathing rate, and metabolism are considered "autonomic", through relaxation and self /regulation techniques, one can make the involuntary voluntary, that is, one can voluntarily control these functions; hence the name "self-regulation"(Kabat-Zinn, 1990; Greenberg, 2003).

Hatha Yoga

Statistics about yoga stress management prove beyond doubt that yoga can be used as an effective therapy to fight stress related problems like BP. HBP is a risk for both heart disease and stroke. It directly increases the risk of heart disease. Hypertension is a risk for heart disease because the heart is working harder than normal thus putting the heart and arteries under a great strain. Yoga and Meditation helps greatly in keeping one's Bp under control who are suffering from hypertension. Walking is the best exercise for hypertension patients. Yoga relaxation and meditation are helped many get maximum relief from hypertension leading to HBP (Herbert, 1997; Greenberg, 2003; Hatha Yoga Poses for Hypertension and Stress Management, 2005).

Biofeedback

Biofeedback uses sensitive instruments to measure, amplify and provide feedback on various physiological processes going on in body such as blood flow, muscle tension, brainwave activity, sweat gland activity, and heart rate. This feedback is used to help one become aware of and manipulate what's going on in the body.

Relaxation strategies, such as the use of relaxing imagery or Progressive Relaxation, are coupled with the biofeedback provided by the biofeedback machine. From this biofeedback, a person learns to associate certain thoughts and actions with the desired change in their physiological responses (Herbert, 1997; Greenberg, 2003; Stress And Hypertension, 2008).

People can practice specific activities designed to relax the body and mind. These activities include Relaxation exercises, Meditation exercises, Breathing exercises and Visualization (Slotnick & Sacher, 2007).

Progressive Relaxation

Progressive Relaxation, another self-regulation strategy, is a series of exercises in which one contracts and then relaxes various muscle groups in the body, progressing from one muscle group to another throughout the entire body. By consciously tensing muscles, one recognizes more readily what it feels like to have the muscles tense, helping to more readily recognize tense muscles. Also, the exaggerated contrast of tension versus relaxation helps one to feel what it's like to have the muscles relaxed (Herbert, 1997; Greenberg, 2003; Stress And Hypertension, 2008).

Autogenic Training

Autogenic training, another relaxation technique, uses body awareness and diaphragmatic breathing to elicit the Relaxation Response. Six sequential stages of Autogenic training include:

- focusing on sensations of heaviness throughout the arms and legs

- focusing on sensations of warmth throughout the arms and legs
- focusing on sensations of warmth and heaviness in the heart area
- focusing on breathing
- focusing on sensations of warmth in the abdomen
- focusing on sensations of coolness in the forehead

With the focus, one repeats phrases to create the desired effect. As is essential in all relaxation techniques, diaphragmatic breathing is coordinated with the exercises (Herbert, 1997; Greenberg, 2003).

Meditation

When speaking about stress management, meditation is considered a method of self-regulation that has, as one benefit, the elicitation of the relaxation response. The meditation is one of the most effective methods in reducing stress, and is perhaps essential in any stress management program. Meditation, as is being used in this discussion, is a process of stilling the mind and quieting the body, of bringing a detached witnessing awareness "of bare attention" to the present moment. Meditation, as is being used in this discussion, does not mean contemplation or to reflect on or ponder over something. That's contemplation, not meditation. During the meditation process, when thoughts, feeling, and sensations arise, one simply notices them and returns to concentrating on the breath (Greenberg, 2003; Stress And Hypertension, 2008).

2.5.2 Exercise

Exercise is a nice complement to self-regulation strategies that work with the breath and the activity of the mind. Exercise works with, and focuses on, the body. Exercise helps to relieve tension from the body, especially in the musculo-skeletal system. Muscle tension results from an impulse to act on something, which is not actually acted upon. Unrelieved stress will cause a build up of tension in muscles, which in turns creates more stress, and a vicious cycle ensues. Thus, it is beneficial to relieve this build up through some means, such as through physical exercise/activity. As tension is unreleased impulse or impulses to act, exercise allows us to express or release the blocked up tension. Both aerobic activity and stretching allows for this release (Herbert, 1997; Greenberg, 2003).

Regular physical exercise has been shown to decrease the level of stress hormones the body releases in response to stress. Exercise has been touted as the single most effective technique to relieve stress. Individuals, especially those with heart conditions, should consult a physician before beginning an exercise program. Aerobic exercise is especially helpful in reducing stress. Experts recommend performing about 20 minutes of aerobic exercise three times a week. Stretching is a form of exercise that relieves muscle tension. A brisk walk is a healthy way to clear the mind and relieve tension (Slotnick & Sacher, 2007).

2.5.3 Communication and social support

Healthy communication, such as the ability to confide to a friend can be a great stress reliever. A healthy social network is a major factor in managing stress. This is the support provided by family, friends and the community in general.

Individuals with heart disease, stroke and other illnesses can take advantage of support groups. People under stress should not hesitate to reach out. In addition to social support, there is self-communication. This may take the form of a stress journal or a diary. Writing letters can be a highly effective method in managing stress – except these letters are never meant to be sent or even read by anyone other than the writer. This strategy has been used by many great leaders, who often operate under conflicting and never–ending pressures, to relieve stress. It is advisable to write these letters on paper and not electronically, as they could accidentally be sent over e-mail or read by the wrong person. People feeling overwhelmed by stress and unable to cope may want to seek professional counseling. Professional counselors include psychiatrists, psychologists, licensed social workers, marriage and family therapists and mental health counselors. A mental health professional can teach a person how to perceive stress and develop appropriate coping skills and problem-solving skills. Muscle relaxation techniques, time-management and other skills may be taught (Slotnick & Sacher, 2007; Stress And Hypertension, 2008).

2.5.4 Healthy Diet

Diet and nutrition play an important role in staying healthy. A healthy person will be more robust against, and resilient to, stressors she may encounter. Conversely, poor diet can compromise one's constructive response to stress. A poor diet will create internal stress, such as stressing the digestive system and other organs in the body. Inadequate nutrition can wreak havoc on the body's metabolism due to an insufficient supply of "fuel" for energy. If the body doesn't get an adequate and consistent supply of fuel for energy, this is in itself a stressor, upsetting internal

systems including the digestive and nervous systems. Excessive intake of stimulants, such as sugar, caffeine, and salt, can also create an up-and-down, unhealthy, and unbalanced cycle in the body. Simply stated: An unhealthy diet will create an imbalance in the body. When there is an imbalance in our mind and body, stress happens. Additionally, a poor diet can make one less robust and resilient to stressors (Kabat-Zinn, 1990; Herbert, 1997; Greenberg, 2003).