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BEST PRACTICES OF HEALTH EDUCATION TOWARDS CARDIOVASCULAR DISEASES FOR MIDDLE-AGED ADULTS

– A literature-based approach



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As the largest community of healthcare professionals, nurses are expected to anticipate the increasing need of taking care patients with cardiovascular diseases. On top of providing actual care and treatments, health care prevention is also needed to be carried out effectively.

In this research, the aim is to review the best practices in health education for middle-aged patients with diagnoses of cardiovascular diseases. The underlying health issues and related risk factors such as behavioral and metabolic risk factors were addressed. Health promotion topics targeting risk factors plus teaching methods were reviewed subsequently for nurses to be more active and confident in planning and delivering the best practices in health education for middle-aged patients with diagnoses of cardiovascular diseases. Specific research questions are: 1) What are the health needs of middle-aged patients who are diagnosed with cardiovascular diseases? 2) What are the health promotion topics needs to be conducted to patients with cardiovascular diseases? 3) What are the best methods or practices of health education according to previous researches for educating middle-aged patients with cardiovascular diseases? 4) What is the nursing mission in prevention of cardiovascular diseases for middle-aged patients?

A literature-based approach is utilized to collect high quality research articles and other materials to answer the research questions. Inclusion and exclusion criteria were set as the boundaries to filter searching results. Reliability and validity of cited references were examined. Ethical aspects were inspected as well.

By utilizing the most comprehensive knowledge targeting each risk factor of different patient, and critically selecting the most appropriate and promising channel of conducting them, the best practices shall be formulated by a professional, skillful, and confident nurse.

Patients with cardiovascular diseases need comprehensive knowledge about CVDs. Health education topics regarding the corresponding behavioral risk factors and metabolic risk factors should be delivered in tailored ways to different patients. Using of visual assistances and other supportive methods during health education process is suggested.

Further studies shall explore new knowledge and innovative ways in health promotion on cardiovascular diseases for middle-aged population. Other risk factors are also encouraged to be explored and analyzed.

KEYWORDS:

Nursing, cardiovascular disease, middle-aged, best practice, health promotion

ABSTRACT

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LIST OF ABBREVIATIONS (OR) SYMBOLS

BMI	Body mass index
CHD	Coronary heart disease
CR	Cardiac rehabilitation
CV	Cardiovascular
CVD/CVDs	Cardiovascular disease / cardiovascular diseases
HDL	High-density lipoprotein
LDL	Low-density lipoprotein
WHO	World health organization

1 INTRODUCTION

Cardiovascular diseases (CVDs), also as known as circulatory system diseases, have become the leading causes of death globally (Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980-2015: a systematic analysis for the Global Burden of Disease Study 2015. 2016). Specifically, about 17.7 million people died from cardiovascular diseases in year 2015, which takes thirty-one percent of all global death. Same year in Finland, as high as thirty-seven percent of deaths were caused by CVDs which tops the causes of mortality in year 2015 (Statistics Finland 2016, WHO 2011). In addition to death, CVDs can lead to serious disabilities, a decrease in quality of life, and substantial economic burden (Akhu-Zaheya, Shiyab et al. 2017).

Given the nature of CVDs, it is recognized that most types of diseases under this group can be prevented. There are three levels of disease prevention namely primary prevention, secondary prevention, and tertiary prevention. Primary prevention targets healthy people in preventing the development of actual illnesses, secondary prevention aims to prevent the recurrence of a disease condition, while tertiary prevention seeks to maintain a reasonable level of chronic condition that cannot be reversed (Goncalves, Le Scanff et al. 2017). In prevention of CVDs, strategies under primary and secondary prevention were given much emphasizes by healthcare professionals due to their effectiveness. Despite the efforts of primary and secondary prevention and recent therapeutic advances, health problems related to atherosclerotic cardiovascular diseases remains constant increasing. According to WHO, secondary prevention refers to finding new effective methods to obtain a positive course of the disease and ensuring optimal conditions for patients, with a

view to their integration in normal life. (Pasca 2015, Jowett, Barton et al. 2017, Torlasco, Faini et al. 2017.) Either by use of medication or implementation of lifestyle changes, prevention of CVD is cost-effective in many scenarios, including population-based approaches and actions directed at high-risk individuals (Piepoli 2017).

Many researchers have studied the prevention of cardiovascular diseases through various methods and angles that target risk factors which lead to circulatory problems. World Health Organization has suggested that population-wide strategic plans should be made especially towards people with CVDs and higher risk of developing CVDs. (WHO 2011.) Windle et al. pointed that some people with CVDs usually do not practice general recommendations made by healthcare professionals. (Alsaleh, Windle et al. 2016.) It is worth to focus on middle-aged population with the age range of 45-64 years old since CVDs can be prevented by controlling the known existed risk factors (Wasniowska, Kozela et al. 2017). In our study, we have followed to use 45-64 as the age range for middle-aged group. Healthcare providers should pay more attention to health education so that more people can learn the dangers of risks. As a professional nurse, providing appropriate guidance and effective health education to generate positive benefits for quality of life and lengthen life expectancy are fundamental missions. How professional nurses perform best practice to teach patient is very important. Using some effective teaching strategies to motivate patients and encourage them become more active. Tailored ways of health education are encouraged to be chosen for people who have already diagnose or have potential high risks for CVDs according to their individual lifestyle. From reviewing literature works and other materials, the purpose of this research is to find evidence of the best practices in preparing health education topics related to cardiovascular diseases and the best ways in delivering them to middle-aged patients with cardiovascular diseases.

2 OVERVIEW OF CARDIOVASCULAR DISEASES

Cardiovascular disease is a broad category of diseases that affect the heart and/or the blood vessels such as ischemic heart diseases, stroke, hypertension, atherosclerosis, thrombosis, peripheral vascular disease and some others. (Chen, Chen et al. 2014, Chang 2015, Goong, Ryu et al. 2016.) As the leading cause of death in the world, cardiovascular disease has brought great attention from multidisciplinary researchers (Cheong, Liew et al. 2017).

Atherosclerosis acts as the main reason for the following types of CVDs: ischemic heart disease or coronary artery disease; cerebrovascular disease including stroke; diseases of the aorta and arteries such as hypertension and peripheral vascular disease. Other CVDs can be congenital heart disease, rheumatic heart disease, cardiomyopathies and cardiac arrhythmias. From the abovementioned types of CVDs, atherosclerotic CVDs take around 86 percent of total CVD deaths in male and 83 percent in female. Therefore, emphasize has been made on atherosclerosis disease. Atherosclerosis is understood as a complex pathological process at the walls of blood vessels which takes years to develop. In this process, fatty materials and cholesterol are accumulated inside the lumen of medium- and large-sized arteries. These deposits as known as plaques narrows the lumen and making the inner surface of blood vessels to be irregular, which hinders the blood flow. Piling up of plaques also makes the blood vessels less flexible. Once the plaque is ruptures at the inner wall of blood vessel (endothelium), blood clots are formed in the circulatory system and travels along the flow to other parts of the body. If it sticks in coronary artery, it can cause a heart attack; if it obstructs cerebral perfusion, stroke may occur. Early development of atherosclerosis can be traced back in childhood and

adolescence due to the overall effect of several risk factors. That is why preventive measures should be lifelong, ideally starts from pregnancy or at least from birth and lasts until the end of life. There are two major domains of risk factors contributing to the process of atherosclerosis: behavioral risk factors and metabolic risk factors. Tobacco use, physical inactivity, unhealthy diet, and harmful use of alcohol are categorized as behavioral risk factors, while hypertension, diabetes and hyperlipidemia and obesity are considered as metabolic risk factors. Other risk factors include poverty and low educational status, advancing age, gender, genetic disposition, psychological factors, and other risk factors such as excess homocysteine (see Table 1). Even though gender is considered as one of the risk factors, CVD affects both men and women. (Perk, Backer et al. 2012, WHO 2011.)

Table 1. Risk factors for cardiovascular diseases (Perk, Backer et al. 2012, WHO 2011)

Behavioral risk factors:
1. Tobacco use
2. Physical inactivity
3. Unhealthy diet
4. Harmful use of alcohol
Metabolic risk factors:
1. Raised blood pressure (hypertension)
2. Raised blood sugar (diabetes)
3. Raised blood lipids (e.g. cholesterol)

4. Overweight and obesity
Other risk factors:
1. Poverty and low educational status
2. Advancing age
3. Gender
4. Inherited (genetic) disposition
5. Psychological factors (e.g. stress, depression)
6. Other risk factors (e.g. excess homocysteine)

Cardiovascular diseases put a great threat especially towards elder population, making it more important to focus on its prevention in order to improve the quality of life to those at risks (Jankovic, Geelen et al. 2015). Furthermore, the problem of population ageing and the great financial pressure brought by healthcare expenditures in developed countries are believed to create a socioeconomic impact especially in healthcare systems (Ninh, Hendrie et al. 2014). Out of all health-related expenditures, cardiovascular diseases rank the most costly diseases globally and in many developed countries. (Abdullah, Jones et al. 2015, Chi, Lee et al. 2011, Ninh et al. 2014.)

Resulted from the constant growing in number of elderly population, the occurrence of cardiovascular diseases also increases particularly with advancing age (Jankovic et al. 2015). Therefore, cardiovascular diseases prevention was highlighted. Cardiovascular disease prevention is defined as “a coordinated set of actions, at the population level or targeted at an individual, that are aimed at eliminating or

minimizing the impact of cardiovascular diseases and their related disabilities”. In spite of the improvements in outcomes of cardiovascular disease prevention with the help of various successful measures such as the smoking legislation, it remains to be one of the biggest health-related issues due to its high morbidity and mortality. (Piepoli 2017.) Sufficient studies have shown that the commonly recognized risk factors for cardiovascular diseases are hypertension, hyperlipidemia, diabetes mellitus, dietary habits, exercise, smoking, and body mass index. (Chu, Pandya et al. 2015, Foraker, Abdel-Rasoul et al. 2016, Zeb, Zeeshan et al. 2016, RADOSINSKA, VRBJAR 2016.) Due to the high prevalence of hypertension, diabetes and obesity, preventing and controlling cardiovascular diseases become really challenging (Cheong, Liew et al. 2017).

3 AIM OF THE STUDY AND RESEARCH QUESTIONS

This study aims to review various measures in prevention for the current situation of cardiovascular diseases and analyze the best practice in delivering health education to achieve better outcomes. Specific questions are:

- 1) What are the health needs of middle-aged patients who are diagnosed with cardiovascular diseases?
- 2) What are the health promotion topics needs to be conducted to patients with cardiovascular diseases?
- 3) What are the best methods or practices of health education according to previous researches for educating middle-aged patients with cardiovascular diseases?
- 4) What is the nursing mission in prevention of cardiovascular diseases for middle-aged patients?

4 METHODOLOGY

4.1 Literature review

Our thesis is conducted through literature-based approach. Literature review techniques are utilized but not only limited to literature works. Literature review is a process to build knowledge advancement based on previous work. It is an evidence-based, in-depth analysis of a subject. In essence, a literature review is a critical appraisal of the current collective knowledge on a subject. A literature review should be an informative, personal but unbiased synopsis of the information, presenting a balanced view that includes conflicting findings and inconsistencies if there is any, as well as established and current thinking, rather than merely being an exhaustive list of all that has been published. Different from a systemic review, a literature review addresses a specific question by combining and comparing the results of various clinical trials. (Winchester, Salji 2016, Xiao, Watson 2017.)

By reviewing relevant literature, the breadth and depth of the existing body of work is understood and the gaps to explore is identified. By summarizing, analyzing, and synthesizing a group of related literature, a specific theory or hypothesis is then tested. Literature review also can be used to evaluate the validity and quality of existing work against a criterion to reveal weaknesses, inconsistencies, even contraindications. (Xiao, Watson 2017.)

It is important for researcher to be mindful about introducing bias during the process of literature review. Whether intentional or not, preconceived ideas about the subject can affect all phases of writing a literature review, from identifying literature sources, selecting articles to cite, until the critical evaluation of evidence. Using certain protocol such as setting inclusion and exclusion criteria can be helpful in controlling and reducing bias. (Winchester, Salji 2016.)

4.2 Searching process of literature

Databases used for searching are listed as following: EBSCOhost, Elsevier: Science Direct, SAGE journals, and PubMed. More specifically, in EBSCOhost we chose Academic Search Elite, CINAHL, CINAHL Complete and eBook Collection. We started searching the current situation and burden of cardiovascular diseases to understand the background. Keywords are used independently or combined to collect materials for analysis (see Table 2). Other necessary supplementary materials are obtained from authorized public websites such as the official website of World Health Organization.

Table 2. Keywords and combinations

First keyword	(and) second keyword	(and) third keyword
primary prevention		
literature review		
middle age	transition	
	stress	
cardiovascular disease risk factors	cholesterol	

cardiovascular disease	quality of life	
	hypertension	
	diabetes	
	smoking	
	exercise	
	physical activity	
	unhealthy food	
	unhealthy eating	
	alcohol or drinking	
	health education	
	teaching methods	
	health education methods	
	rehabilitation programs	
	knowledge	
	best practices	
	health promotion	
	overweight	obesity
	alcohol	Finland
	secondary prevention	middle age
cost effective		

Due to the rapid development of modern medicine, we have initially limited the publication year from 2007 to 2017. More narrowed time limit is applied when the results from searching is rather abundant. First screening was done by reading the titles. Second screening included reading the abstract. The third screening involved

reading or skimming the full-text of the remaining articles. After which we critically decided whether the article is relevant and reliable enough to be cited. Inclusion and exclusion criteria were applied during different phases of screening process. Searching results are listed at the end (see Appendix 1).

4.3 Inclusion and exclusion criteria

Literature works, clinical studies and statistical materials that provide information, knowledge or facts related to cardiovascular diseases were included to this research. Studies were collected not only from nursing field but also from multidiscipline. We only included studies written in English language. If more than one version of the same material exists, both old and new versions were analyzed and compared to find out the differences and shifting of emphasis. Only the latest version is included if the content in previous version is no longer significant to the current situation. Unrelated comorbidity studies were not taken. As well as any studies that highly focused on certain drug or chemical compound with the emphasis on its pharmacological effects towards patients with CVDs. Articles are excluded if the original full-text cannot be found by any means.

5 HEALTH NEEDS OF MIDDLE-AGED PATIENTS WITH CARDIOVASCULAR DISEASES

Despite the fact that middle-aged group is facing tremendous health-related problems, lesser amount of studies was made targeting this group compared with

adolescents and elderly groups. It was pointed out that major reports do not focus on this age group. (Phillips, Robin et al. 2010.) Not only the published studies about middle-aged population are insufficient, but also the theoretical conceptualization for this group remains ambiguous until the latest reference. The age boundaries of middle-age period are not clearly delineated, rather, it is understood as the period of life falls between “young” and “old” age with a roughly defined range between 40 or 45 to 65 years old. Within this transitioning period of life, both men and women are facing challenges such as women’s menopause and men’s fatherhood with children around puberty. (Dolberg, Ayalon 2017, Eggebeen, Dew et al. 2010.) A 12-month continuous study showed that middle-aged population, in fact, is more likely to suffer from mental disorders such as depression, anxiety disorder, post-traumatic stress disorder and any affective disorder. With the stress coming from daily work, marital status such as separation, divorce or death of a partner has built a relatively high prevalence of seeking mental help and guidance compared with elderly population. Besides, self-report presence of a physical disorder was significantly associated with the presence of mental disorder for middle-aged group. (Trollor, Anderson et al. 2007.)

As the crossroad of youth and old age, midlife is a pivotal period in the life course which Balances growth and decline, links earlier and later period of life, and bridges younger and older generations in the family. Typically, adults in middle life are overwhelmed with too much to do but not enough time. Furthermore, physical changes and memory lapses start to kick in, and the realities of aging both bodily and mentally come into the picture. All of these experiences challenge the basic human need for control. Studies highlighted that feeling in control is one of the key factors for health and happiness. Overall, a far-reaching impact was predicted by promoting health and well-being in middle age period. (Lachman, Teshale et al. 2015.)

5.1 Needs of health education for behavioral risk factors

The knowledge of **smokers** regarding the adverse health effects is quite superficial. Most of smokers believe that cigarettes, water pipes and other forms of tobacco usage could cause CVDs and other respiratory problems even lung cancer. But little is known how exactly does smoking affect various systems in human body. Researchers also found out that the majority of smokers who use water pipes have a false belief that water pipe smoking brings less damage to general health compared with smoking cigarettes. Elshatarat et al. gathered data from 112 adult smokers who were hospitalized with CVDs. Result showed that even though more than 90 percent of subjects believe that smoking can cause CVDs, only about half of total subjects presented serious willingness to quit smoking. Moreover, patients were unrealistic as to the methods they planned to quit smoking. Most of those who attempted to quit smoking did not have any help from others. Despite the previous unsuccessful experience of smoking cessation, most of men were willing to use the same ineffective methods in the future. In the process of smoking cessation, self-efficacy was proven to be statistically significant to smoking cessation rates. Specifically, high levels of self-efficacy predict not only the success of smoking cessation but also the maintenance of smoking cessation. (Elshatarat, Stotts et al. 2013.) One interesting fact is that the risks of death caused by smoking are notably different men and women. More specifically speaking, women who smoke are four times risky for death from ischemic heart disease compared with male smokers. As to cerebrovascular diseases, sex difference in risk of death has not been found. (Kks, Fischer et al. 2017.)

Physical inactivity is recognized as one of the living habits that have been proven to be causally related to metabolic and cardiovascular diseases (Vuori 2007). Even

though it is undeniable that physical activity decreases with aging process in general from chronologic perspective, physical activity was still highly recommended with specific amount and intensity since it is considered as one of the modifiable behavioral risk factors. At least 120 minutes of moderate physical activity per week was suggested from European guidelines on cardiovascular disease prevention. This recommendation was recently modified with an increase level for adults. Even with a concrete recommendation from authorized organizations, available data report that at least 31 percent of population failed to meet the recommended minimum physical activity levels worldwide. The average global prevalence of physical inactivity is 17 percent, while in developed countries, as high as 27.8 percent of population were considered physical inactive. (Arija, Villalobos et al. 2017, Willey, Paik et al. 2010.)

Even though **dietary habit** is profoundly influenced by cultural and geographical factors, it is always worth looking into since diet exerts a great influence on CVD (Olinto, Gigante et al. 2012, Centritto, Iacoviello et al. 2009). Apparently, healthy population always has the freedom to make unhealthy choices at the matter of dietary awareness, especially with the extended availability of unhealthy food products. For example, most of fast food companies provide various condiments including salt, ketchup, and other sauces which have no health benefits but are unlimitedly offered without any charges. This kind of setting pervasively enables people to make unhealthy decisions. Adding the frequency of people consuming fast foods, it exposes a need to provide preventive measures to mitigate cardiovascular consequences. (Ferenczi, Asaria et al. 2010.) The other common dietary issue is regular consumption of soft drinks which contain high quantity of sugar. With little nutritional benefits, soft drinks may be a key contributor to epidemic of overweight and obesity, at the same time increase risks for diabetes, fractures and dental caries as well. (Hijov, Geckov et al. 2014.)

Alcohol consumption is recognized as one of the biggest public health challenges that modern societies are facing. It is ranked as the third largest risk factor for disease burden in the world. Several observational studies found epidemiological evidence indicates that mild to moderate alcohol drinking has protective effects on cardiovascular disease morbidity and mortality compared with non-drinking, but binge drinking is linked with increased mortality. (Graff-Iversen, Jansen et al. 2013, Britton, Hardy et al. 2016.) Even though there are beneficial and detrimental effects depending on the volume and patterns of alcohol consumption due to the complex effects brought by ingesting alcohol, the consumption of alcohol is causally related to several major CVD types. (Rehm, Shield et al. 2016.) In Finland, however, the protective effect of alcohol use is not a common motive for drinking. From a recent study, only slightly more than 3 percent of Finns reported using alcoholic beverages to promote health and prevent cardiovascular disease. This was pointed out to aid the intoxication-oriented drinking habit to be common among Finns. The other problem is alcohol-related death. Alcohol-related death is subdivided into two categories. First category includes death caused by alcohol poisoning or alcohol-related diseases such as alcoholic liver, alcoholic cardiomyopathy and alcoholic pancreas. The other category consists of accidental and violent deaths contributed by alcohol intoxication such as traffic accidents or drownings. From a 15-year study (1990-2004) in Finland, alcoholic-related deaths increased by almost 80 percent in women, and clearly increased in men. (Mäkelä, Österberg 2007.) Recent study on Finnish drinking culture revealed that even though the drinking culture has changed from dry to wet, this transition has not diminished the acute harms from old dry drinking practices, at the same time introducing more types of chronic alcohol-induced harms that originated from wet drinking cultures (Mkel 2011). Some current studies focus on long-term ill-health effects of the drinking habits of middle-aged population, since this group has been described as “hidden risky drinkers” (Britton et

al. 2016).

5.2 Needs of health education for metabolic risk factors

As one of the most ranked public health problems in developed countries, **hypertension** is estimated to cause 7.1 million global deaths annually, and it attributes to around two-thirds of stroke cases and half of heart diseases (Vuori 2007). Hypertension is called as the “the silent killer” since it usually remains asymptomatic in people who already have it (Kumari, Kaur et al. 2015). Patients with hypertension need comprehensive information and knowledge on disease process and how lifestyle should change with the diagnosis of such condition. Alternative therapies should also be introduced on top of medications that control hypertension. Besides, continued education and encouragement should be provided to empower patients to come up with an acceptable plan that helps them to compensate with hypertension and adhere to the agreed treatment plan. (Kumari, Kaur et al. 2015.)

From the 2015 International Diabetes Federation report, the prevalence of **diabetes** in adults was 8.8 percent worldwide, from which 85-90 percent are type 2 diabetes mellitus. A 10 percent increase of prevalence by the year 2035 was predicted mainly due to the epidemics of overweight/obesity. (Chiao-Ming Chen, Jen-Fang Liu et al. 2017.) Cardiovascular mortality is 2 to 4 times higher in those who has diabetes at the same time. From another angle, most diabetic patients eventually die from cardiovascular diseases. (Rodriguez, Weiss et al. 2017.) Patients need to understand that lifestyle modifications including physical activity and diet are the cornerstone to maintain the diabetic condition and protect against severe complications (Chiao-Ming Chen et al. 2017).

Serum cholesterol level is linearly related to one of the most common types of CVD, which is coronary heart disease. Furthermore, CVD with dyslipidemia is a significant cause of morbidity and mortality. (Savolainen, Kautiainen et al. 2015.) Cholesterol is a precursor of steroid hormones at the same time plays an essential component of the cell membrane. Altered regulation of the synthesis, absorption and excretion of cholesterol predispose to atherosclerotic CVDs. (Zrate, Manuel-Apolinar et al. 2016.) Therefore, low level of high-density lipoprotein (HDL) is a well-known independent and predictive risk factor for CVD (Naghii, Almadadi et al. 2011). In Finland, the outstanding success of North Karelian project has greatly improved quantity and quality of dietary fat intake and led to a significant reduction in blood cholesterol levels. Along with the decline in serum cholesterol levels, mortality from CVD such as coronary heart disease (CHD) among middle-aged population is remarkably decreased. However, this decline in serum cholesterol levels has levelled off and went back with an increase of 1.7% in men and 3.1% in women during 2007-2012. (Savolainen, Kautiainen et al. 2015.)

Overweight and obesity bring up risk of CVD from two major ways. First, obesity shows a strong association with other major CVD risk factors such as hypertension, atherosclerosis, type-2 diabetes mellitus and dyslipidemia. Second, Increased adiposity can independently induce changes in the cardiac structure and function. Besides, overweight and obesity can cause alterations in central and peripheral hemodynamics, including increased total blood volume, decreased systemic vascular resistance, and a rise in left ventricular stroke volume, cardiac output, left ventricular filling pressures and pulmonary artery pressures. Obese group is prone to have left atrial enlargement, greater right ventricular mass and end-diastolic volume. (Oktay, Lavie et al. 2017.) Regardless the efforts on controlling epidemic

overweight and obesity, the prevalence of obesity is still increasing globally. The majority of world population live in countries where overweight and obesity cause more deaths than insufficient weight nowadays. (Eguaras, Toledo et al. 2015.)

6 HEALTH PROMOTION TOPICS

6.1 Behavioral modification

Stopping smoking is the most cost-effective way for cardiovascular prevention. Smoking increases the development of both atherosclerosis and thrombotic phenomenon (Piepoli 2017). Smoking leads to blood clots, reduced high density lipoprotein, high blood pressure and increased heartbeat. Tobacco smoke is more harmful when smoker inhaled. Passive smoking increases the risk of cardiovascular disease. People exposed to secondhand smoke especially the children at home can cause cardiovascular disease, respiratory problems and cancer. Passive smoking should also be avoided. (Kazemzadeh, Manzari et al. 2016.) Encouragement and motivational interventions, nicotine replacement, varenicline or bupropion should be provided for assisting cessation. All kinds of nicotine replacement include chewing gum, transdermal nicotine patches, nasal spray, inhaler, sublingual tablets are effective. (Piepoli 2017.)

Physical activity is very conducive for our health. Regular physical activity can help people prevent all causes and cardiovascular mortality. It has a positive effect on many risk factors including hypertension, type 2 diabetes, body weight. Physical activity prevents the development of hypertension and reducing blood pressure in

hypertensive patients, increasing high density lipoprotein cholesterol levels, help control body weight, and decrease the risk of developing non-insulin-dependent diabetes mellitus. Physical activity increases fitness and enhance mental health. A sedentary lifestyle is one of the major risk factor for cardiovascular among people. People should be encouraged to start aerobic physical activity. Health providers should assess patient physical level. How many days per week and minutes per day they spent time on doing exercise. Health provides can advise patients on appropriate kinds of activities. Help them find some exercises that they willing to do during in their daily life. Activities need to be sustainable. Brief activities are more cost effective than supervised gym activities classes. Aerobic physical activity has a beneficial effect on prognosis. It can help large muscle mass movement in a rhythmic way for a continuous time. The exercises involve in walking, cycling, heavy household work, gardening, Nordic walking, hiking, jogging, aerobic dancing, skating or swimming. Moderate or vigorous aerobic activity should be suggested. For patient who are taking medication, it is important to consider heartrate response and other relative intensity limitations. Sedentary patients should be strongly encouraged to start light-intensity exercise programs. Physical activity is recommended frequency of at least three to five sessions per week. (Piepoli 2017.) Cardiac rehabilitation (CR) is considered as the most effective secondary prevention for patients with CVDs to reduce cardiovascular risks and monitor patients with CVDs in the long run (Gostoli, Roncuzzi et al. 2016, Pasca 2015).

A **healthy diet** is recommended of cardiovascular prevention in all patients. Lowering the intake is usually recommended. Dietary intake of fats increases the risk of cardiovascular diseases such as coronary heart disease and stroke through their effects on blood lipids, thrombosis, blood pressure, arterial function, and inflammation. Soft drinks consumption stands for a main source of high sugar intake, which might significantly lead to overweight and obesity. Soft drinks supply little

nutritional to our health, high added-sugar content may be a key factor to overweight and obesity. It also probably causes the risk of diabetes, fractures and dental caries as well. Drinking is an important part of a lifestyle, the consumption of drinks such as water, low-fat milk, and small quantities of fruit juice should be recommended. (Hijov et al. 2014.) Energy intake should be controlled to maintain a healthy weight. In general, when following the diet plan for a healthy diet, there is no dietary supplement are needed. Table 3 has shown the characteristics of a healthy diet.

Table 3. Characteristics of a healthy diet (Piepoli 2017)

● Saturated fatty acids to account for <10% of total energy intake, through replacement by polyunsaturated fatty acids.
● Trans unsaturated fatty acids: as little as possible, preferably no intake from processed food, and <1% of total energy intake from natural origin.
● <5g of salt per day.
● 30-45g of fibre per day, preferably from wholegrain products.
● ≥200g of fruit per day (2-3 servings).
● ≥200g of vegetables per day (2-3 servings)
● Fish 1-2 times per week, one of which to be oily fish.
● 30 grams unsalted nuts per day.
● Consumption of alcoholic beverages should be limited to 2 glasses per day (20g/d of alcohol) for men and 1 glass per day (10 g/d of alcohol) for women.
● Sugar-sweetened soft drinks and alcoholic beverages consumption must be discouraged.

The Mediterranean kind of diet particularly caught attentions in recent years. The Mediterranean diet consists of many of the nutrients and foods such as high intake of fruits, vegetables, legumes, wholegrain products, fish and unsaturated fatty acids especially olive oil; moderate consumption of alcohol, mainly wine consumed with meals, low consumption of red meat, dairy products and saturated fatty acids. The studies have shown that greater adherence to a Mediterranean diet is associated

with a 10% reduction in cardiovascular (CV) incidence or mortality. (Piepoli 2017.)

Alcoholic beverages are full of energy. These extra calories from alcohol may lead to weight gain. Alcohol consumption has indicated a contributing factor to an increase in body weight, body fat and body mass index (BMI). (Rohde, Ångquist et al. 2017.) It is a common idea that alcohol consumption can lead to chronic ailments. Alcohol consumption also increases risk factors for many chronic diseases and conditions. Regular alcohol consumption significantly increased the risk of obesity. (Daudet, Kelechi Ibe-Lamberts et al. 2017.) Drinking three or more alcoholic beverages per day is related to increase cardiovascular risk. The research suggests a lower risk of cardiovascular occurring with moderate such as one to two units per day alcohol consumption compared with non-drinkers. (Piepoli 2017.) Health provider should to educate patient limit consumption to no more than 2 drinks (e.g. 24 oz beer, 10 oz wine, 3 oz 80-proof whiskey) per day in most men, and to no more than 1 drink per day in women and lighter weight people (Go, Bauman et al. 2014).

6.2 Metabolic adjustment

Elevated blood pressure is a major risk factor for cardiovascular disease. High-quality blood pressure management is achieved from the cooperation of patients, families, providers, healthcare delivery systems and communities. This includes improving patient awareness and knowledge of chronic disease, modifying lifestyle and behavior, providing an effective diagnosis and treatment guideline, making sure the medication adherence and regular follow-up of patients. Lifestyle modifications should be advised to all patients with hypertension, and they should be assessed for target organ damage and cardiovascular disease. (Go et al. 2014.) Self-monitoring

is encouraged for most patients throughout their care. Periodic blood pressure monitoring is recommended for screening and diagnosis of hypertension. If blood pressure is elevated or accompanied by target organ damage or other cardiovascular factors, patients need to repeat measure their blood pressure within a shorter period in order to make treatment decisions. Health providers should advise patients to follow the prescribed course of blood pressure-lowering drugs for achieving blood pressure goals. Hypertensive patients need to be mindful with salt restriction. Patient should be educated to avoid adding excessive salt or foods contain high level of salt already. Hypertensive patients should generally be suggested to eat more fresh fruits and enough vegetables at the same time decrease their intake of saturated fat and cholesterol. There is sufficient evidence to recommend that systolic blood pressure be lowered to <140 mmHg and diastolic blood pressure to <90 mmHg in all hypertensive patients. (Piepoli 2017.)

Diabetic patients are on average at double the risk of developing cardiovascular disease. Achieving low blood pressure levels, low low-density lipoprotein (LDL) and total cholesterol concentrations is very important. In general, patients with type 2 diabetes have various cardiovascular risk factors, therefore nurses need to familiarize with CVD prevention guidelines. Healthcare providers should be able to advise patients for healthy life behaviors. Most diabetic patients are obese, that is why dietary modification with reduction in energy intake is planned to lower body weight for those who are already overweight or obese. Dietary patterns are very important for patients with diabetes. Healthcare providers should encourage patients to eat more fresh fruits, enough vegetables, wholegrain cereals and low-fat protein products at the same time Limit saturated fats and alcohol intake, monitor carbohydrate consumption and increase dietary fiber. A Mediterranean-type diet is recommended for diabetic patients. Salt intake should be also restricted. Encouraging diabetic patients to increase their physical activity levels should be

central in the management for patients with type 2 diabetes. Diabetic patients are encouraged to have aerobic activity and resistance exercise training. Studies showed that doing these physical exercises is effective in the prevention slowing of the progression of diabetes. However, it is crucial for healthcare providers to help patients seeking sustainable ways to maintain their level of exercise. Smoking increases the risk of diabetes; thus, it should be strongly discouraged. According to CVD prevention guidelines, all diabetic patients above the age of 40 years are advised for statin therapy. Lipid lowering agent are recommended to reduce cardiovascular risk in all patients with diabetes. Nurses should provide such information for patient to have a better understanding of the importance of following prescribed regimen. (Piepoli 2017.)

Elevated levels of plasma LDL **cholesterol** are leading to atherosclerosis. Health providers need to recommend healthier lifestyle with dietary modifications. Low HDL cholesterol is associated with higher cardiovascular risk. HDL level $< 1.0\text{mmol/L}$ ($<40\text{ mg/dL}$) in men and $<1.2\text{mmol/L}$ ($<45\text{ mg/dL}$) in women may be regarded as a marker of increased risk. Statins can decrease LDL cholesterol, reduce cardiovascular morbidity and mortality. Secondary dyslipidemia can also result from alcohol abuse. Patients who are also drinkers should be educated to limit alcohol consumption. (Piepoli 2017.)

Both **overweight and obesity** are related with an increased risk of cardiovascular disease. Healthy weight in the elderly has a higher percentage than that in the young and middle-aged groups. Achieving and maintaining a healthy weight has beneficial effects on controlling metabolic risk factors (BP, blood lipids, glucose tolerance) and lowering CV risk. Health providers can teach patients on how to measure BMI independently [weight (kg)/height (m²)]. BMI is used widely to define the categories

of body weight. Health providers can recommend patient to measure their waist circumference as well. Patients' waist circumferences ≥ 94 cm in men and ≥ 80 cm in women means the body weight should not be gained. And If patients' waist circumference is ≥ 102 cm in men and ≥ 88 cm in women, then weight reduction should be advised. Diet, exercise and behavior changes are the main therapies for overweight and obesity. Medical therapy with bariatric surgery are additional options. (Piepoli 2017.)

7 METHODS OF HEALTH EDUCATION

With the technological advancements seen in the healthcare environment and the increase in the complexity of patient care needs, nurses need to have sufficient education strategies to deliver the care to individual patient (Forfa 2013). It is important for cardiovascular nurses to have a comprehensive understanding of patients' needs, a high awareness of CVDs and the ability of using effective teaching methods to reduce the risk of the disease (Pasca 2015). Cognitive behavioral methods are effective in supporting patients to keep a healthy lifestyle. Caregivers establish cognitive-behavior strategies to assess the patient's thoughts, attitudes and the perceived ability to change behavior. Strategies such as motivational interviewing are recommended to encourage lifestyle changes. The central step is helping patients to establish realistic goals. Communication training is important for health professionals. The "ten strategic steps" can improve counselling of behavioral change (see Table 4). (Piepoli 2017.)

Table 4. Ten strategic steps to facilitate behavior change (Piepoli 2017)

1. Develop a therapeutic alliance.

2. Counsel all individuals at risk of or with manifest cardiovascular disease.
3. Assist individuals to understand the relationship between their behavior and health.
4. Help individuals assess the barrier to behavior change.
5. Gain commitments from individuals to own their behavior change.
6. Involve individuals in identifying and selecting the risk factors to change.
7. Use a combination of strategies including reinforcement of the individual's capacity for change.
8. Design a lifestyle-modification plan. Involve other healthcare staff whenever possible.
9. Involve other healthcare staff whenever possible.
10. Monitor progress through follow-up contact.

Communication is the way for a nurse to build a therapeutic relationship with her patient in order to help them accomplishing goals in the healing process. People with diseases, illnesses, injuries often feel stressed, anxious or depressed. Nurses need to be sensitive with patient's feelings and encourage them to talk about their feelings. Overall establishing good nurse-patient relationships based on trust and respect.

Nurses use a patient-centered communication to teach patients. Positive feedbacks can be given to patients if they are actively participating in their own care and activities of daily living. Evidence showed that encouraging patients with positive feedbacks predicts better outcomes. When teaching patients, nurses need to listen

carefully for making sure a right understanding of the patient's choices and identify barriers that hinder patients to reach health education and obtain healthcare services. Nurses ask patients to identify their desired changes, and then listen actively to help them expressing their emotions and possible ambivalence toward change. Nurses also can use motivational interviewing techniques to help patients to express their ideas and provide some solutions related to ideal behavioral changes. Help patients find approaches to cope with problems and evaluate results of patient's actions. (Wisnewski 2017.)

In addition, it is very essential for nurses to know about each patient's individual concerns, thoughts, previous knowledge, lifestyle and experiences. Individualized counselling is a good way for inspiring and improving patients' motivation and commitment. Caregiver need to respect patients and their family decision. Decision-making should be shared between caregiver and patient, therefore ensuring that patients and their family involvement are positive in lifestyle modification and medication adherence. A friendly and positive interaction not only can establish a good relationship between patients and caregivers, but also serves as a powerful tool to improve patient individual's ability. Nurse can use the following principles of communication to facilitate patient's treatment and prevention of cardiovascular diseases (see Table 5). (Perk, Backer et al. 2012.)

Table 5. Principles of effective communication to facilitate behavioral change. (Perk, Backer et al. 2012)

- Spend enough time with the individual to create a therapeutic relationship- even a few more minutes can make a difference.

<ul style="list-style-type: none"> ● Acknowledge the individual's personal view of his/her disease and contributing factors.
<ul style="list-style-type: none"> ● Encourage expression of worries and anxieties, concerns and self-evaluation of motivation for behavior change and chances of success.
<ul style="list-style-type: none"> ● Speak to the individual in his/her own language and be supportive of every improvement in lifestyle.
<ul style="list-style-type: none"> ● Ask questions to check that the individual has understood the advice and has any support he or she requires to follow it.
<ul style="list-style-type: none"> ● Acknowledge that changing life-long habits can be difficult and that sustained gradual change is often more permanent than a rapid change.
<ul style="list-style-type: none"> ● Accept that individuals may need support for a long time and that repeated efforts to encourage and maintain lifestyle change may be necessary in many individuals.
<ul style="list-style-type: none"> ● Make sure that all health professionals involved provide consistent information.

Caregivers need to know patients' preference of diet when teaching patient. Dietary assessment is based on different patients. Caregivers should assess patients' nutritional status, then provide a treatment diet plan and guide them eating in a healthy way.

Caregivers can use vivid teaching methods to educate their patient. For example, visual aids method is a good way to teach patients. Visual aids method enhances patient's interests of learning, and it is also more effective for patients to absorb knowledge. Caregivers may use food models, measuring cups and spoons to give

more visual impression to patients. Using food labels and empty food containers to make knowledge more understandable for patients. (Collins 2016.)

Changing smoking behavior is a basis of improving cardiac patients' health. Many patients increase high risks of recurrent of cardiovascular disease and death because of not receiving enough nursing interventions in hospital stays and difficulties in providing care with a sufficient amount after patients' discharge. (Berndt, Bolman et al. 2014.) Quitting smoke must be encouraged in all patients. Smoking cessation is a hard process because it is strongly addictive both pharmacologically and psychologically (Perk et al. 2012). Tobacco dependence is not only an addiction but also a chronic disease. Moreover, to overcome the weakness of bedside counseling in hospitals, guidelines recommended approaches such as the "5 As". "5 As" is a systematic model for treating tobacco use and dependence. It includes asking all patients for tobacco use through systematic screening, advising to quit, assessing willingness to quit, assisting with quitting, and arranging follow-ups (see Table 6). (Elshatarat, Stotts et al. 2013.)

Table 6. The "Five As" for a smoking cessation strategy for routine practice (Elshatarat, Stotts et al. 2013)

A-ASK:	Systematically inquire about smoking status at every opportunity.
A-ADVISE:	Unequivocally urge all smokers to quit.
A-ASSESS:	Determine the person's degree of addiction and readiness to quit.
A-ASSIST:	Agree on a smoking cessation strategy, including setting a quit date, behavioral

	counselling, and pharmacological support.
A-ARRANGE:	Arrange a schedule of follow-up.

Smoking cessation can be enhanced by using pharmacologic therapy, counseling and cognitive behavioral therapy. Telephone counseling and face-to-face counseling are both effective in enhancing cessation rates in the general population. Smoking cessation counseling is convenient, time-saving, and low costs delivered by telephone. Telephone counseling can be provided outside the cardiac ward. Time and frequency of counseling sessions depend on the individual needs of each patient with specific characteristics. Patients without walking ability or those who are unwilling to face counseling can use telephone counseling. Making a suitable way for providing smoking cessation counseling to patients is very important. (Berndt et al. 2014.) Nurses need to teach patient about the harmful consequences of smoking, provide cognitive behavioral therapy and social support. These treatments can motivate and foster patient confidence to quit (Elshatarat et al. 2013).

Furthermore, nicotine replacement therapy is an ideal method. Nicotine replacement therapy has been found to be both safe and effective for cardiovascular disease patients. It suppresses withdrawal symptoms, and most patients can use it by doctor's prescription. (Berndt et al. 2014.) Motivation is the most important factor of successful quitting. Professionals can motivate patients to achieve the outcomes. Both individual and group behavior interventions are effective in helping patients quit smoking. It is vital to get support from their family members and the partner. Family members who want to quit smoking together with the patient can make smoking cessations more effective. (Perk et al. 2012.)

Physical activity is very essential for cardiovascular patient to maintain or improve health. Healthcare professionals can use some effective methods to increase their enthusiasm and initiative. Using diaries or records to self-monitor their own progress is very useful in strengthening awareness about existing behavior and increasing patient physical activity. Regular follow-ups and contacts by healthcare professionals are supposed to improve patients' self-monitoring of reaching goals. Research confirmed the value of delivering behavioral change strategies through face-to-face consultation, and telephone follow-up. More and more mobile phone text messages are used to support health care. Thus, it is a convenient and easy way to contact regular patient by using text message reminders. (Alsaleh, Windle et al. 2016.)

Cardiac nurse using face-to-face consultation with cardiac patients. When meeting patients, nurses discuss health problem with patients and find out patient's barriers to physical activity. Nurses help to establish patient's confidence and encourage them making their own individualized plans and short-term goals. After patient setting their own goals, nurses use verbal encouragement to give them feedback and assess patients' achievements of their goals during the process of carrying out agreed plans. Nurses help patients to set up their positive ideas of physical activity and correct their negative attitudes. Once the goals have been set, as the process goes, the nurse should provide tailored feedback, go through their goals and help patient overcome any difficulties. Text message contents also remind patients to maintain required physical activity level and encourage them to deal with barriers. This kind of method was effective in increasing physical levels among patients and help them to achieve their health goals. (Alsaleh et al. 2016.)

Telehealth has become more and more common as a flexible home-based model under secondary prevention. It includes telephone, Internet and video conference

communication. Sessions can be delivered to participants at appropriate time in their home. It is very convenient and flexible for the participants. Most of patients who are not presently participating in traditional cardiac rehabilitation or secondary prevention programs can get information about disease prevention through telephone-delivered programs. Telephone-delivered programs enhance health outcomes. It also encourages patients to join traditional programs to obtain health information. (Hawkes, Patrao et al. 2013.)

Mobile health has become more common in chronic disease management and health education. It includes both web-based and smartphone applications. From mobile store, patient can download useful applications which relate to their own health concerns. It is a convenient and accessible way for the public to promote their health and overall welfare. The researches have shown the effectiveness of mobile health in significantly improving self- management in western countries. This kind of way in the mobile app could help encourage behavioral changes. It offer a new and potentially effective way to involve people and gradually increase their knowledge of disease prevention. Mobile health provided more chances for patient to self-directed learning and relearning. It is obviously showed that mobile health promotes better acceptability and higher treatment adherence of the growing popularity. Using mobile health tools can provide health information of disease prevention to a large population at a lower cost. More and more patients can increase their awareness and knowledge of disease preventions through mobile health applications. (Zhang, Jiang et al. 2017.)

Cardiac rehabilitation program concentrates on several psychosocial and biological predictors such as depression, low social support, high perceived stress, low spirituality, low life satisfaction, overall health status and cholesterol levels. Some

cardiac rehabilitation program has monitored exercise, cooking classes, educational lectures, group support, stress management classes, music therapy and spirituality classes. A weekly lecture series provides educational material about the progression and treatment of heart disease. Weekly cooking classes showed patients how to prepare high-fiber, low-fat recipes. Music therapy showed patients to use music knowledge such as listening to music and playing instruments to relieve stress and enhance health. Spirituality classes examine own thoughts and discuss about spiritual well-being. (Kreikebaum, Guarneri et al. 2011.)

Well-recognized methods include patient-centered communication, individual counseling, motivational interviewing, cardiac rehabilitation program, mobile health, telehealth, visual aids method, Self-monitoring (e.g. write food diary, blood pressure measurement and blood glucose monitoring), group sessions, and other electronic communication supporting behavioral change have been indicated to enhance both lifestyle and medication adherence. Involving the patient and the patient's family with frequent follow-up will also improve success and achieve their suitable short-term goals. (Mosca, Benjamin et al. 2011.)

Combining the knowledge and skills of professional staffs such as physicians, nurses, psychologists, experts in nutrition, cardiac rehabilitation can help patient prevent disease. These interventions involve in promoting a healthy behavior through lifestyle changes, including diet, physical activity, and smoking cessation programs. Effective methods can enhance patient coping with illness in order to improve patient adherence and cardiovascular outcome. Patients who have psychosocial risk factors such as stress, social isolation, and negative emotions will have barriers against behavior change. These patients can be arranged in tailored counselling or group consultation. Patient may meet their specific needs regarding information and

emotional support. (Piepoli 2017.)

Nursing professionals in hospital are in an important position to support their patients regarding psychosocial risk factors among individuals with high cardiovascular risk or chronic disease risk. Empathic, patient-centered communication helps to set up and keep a good relationship. Emotional support and professional guidance are important of helping patients to deal with depression, anxiety, psychosocial stress and other cardiovascular disease risk factors. Supportive caregivers need to have a friendly interaction with patients. Caregivers should spend enough time, listen actively and repeat their major keywords when they consult with their patients. When communicating with patients, encourage them to express their feelings. Explain patiently the process of disease treatment in patient's own language and reinforce correct thoughts and actions to patients. Caregiver needs to summarize the main aspects of the consultation and confirm that the patient is clear about information. (Piepoli 2017.)

On top of that, innovative ways of health education were suggested for better outcome. For example, the acceptability and feasibility of using electronic devices to reinforce outcome for patients with CVDs have been supported by recent studies. (Zhang, Jiang et al. 2017.)

To sum up, patient-centered communication helps to keep a good relationship between patients and health care professionals. Individual counseling and motivational interviewing can help patients to establish their realistic goals as well as providing tailored feedback to patients. Patients can participate in various cardiac rehabilitation program to enrich their life and obtain more useful health information

during cardiac rehabilitation class time. Patients may use smartphone applications to read health information through mobile phone. Electronic devices provide more chances for patient to self-directed learning and relearning. Visual aids method helps patients to be more intuitive to know the food measurement tools and get a better perspective of health problem. Patients also can write health diaries or records to self-monitor their own health progress. Writing health diaries can cultivate patients to establish a good habit and strengthen their health awareness.

8 NURSING MISSION FOR CARDIOVASCULAR DISEASE PREVENTION

As the largest community among healthcare professionals, nurses carry the great responsibility in the mission of general health promotion since one of the major roles of a nurse is being an educator. In clinical settings, one of the most essential components contributing to successful patient outcomes is patient education. By conducting patient education, information and rationale are provided for one to make healthy decisions from more available opinions. People then exercise more control over their own health and over their environments, and to make choices conducive to health, which achieves health promotion. Patient education serves as a vital opportunity to improve patient outcomes especially by nurses. Even with knowing the fact that patient education needs to be conducted thoroughly, most nurses admitted that they were not able to prepare properly and fulfil the role as educator. Besides, there are several factors that obstructs the flow of patient education such as lack of motivation, skills, confidence and competence. Suggestions were made that nurses should actively initiate and participate in patient education to achieve better patient health outcomes. Necessary support and resources from organizations

are needed to raise confidence and competency of nurses, thereby encourages them to be successful patient educators. (Sherman 2016, Victor, Sommer et al. 2016, Taggart 2009, WHO 1986.)

When focused on health education specifically towards patients with cardiovascular diseases, Yang et al. noticed that some of patients exhibit knowledge deficits and lack of awareness about chronic diseases. One example given was that they found out patients with CVDs did not realize the addiction towards smoking is both psychological and pharmacological. The risks brought by their unhealthy lifestyle is not clearly recognized or understood. (Gong, Yang et al. 2016.) Therefore, necessary evaluations should be conducted prior to health education. It was highlighted by Gujral and Sawatzky that nurses should fulfil the fundamental role in cardiovascular risk assessment and education for patients and families because ensuring accurate perception of CVD-related risks and motivating risk-reduction behaviors are essential to decrease the likelihood of developing CVDs. (Gujral, Sawatzky 2017.) Modern theory of health education towards patients with CVDs focuses on quality of life by helping and motivating patients, modifying lifestyles, anticipating the influence brought by existing risk factors, and eventually improve the prognosis (Kobilic, Smajic 2016). From the general perspective in cardiovascular diseases care, nurses need to carry the flag to raise social awareness of cardiovascular diseases and its related risk factors.

9 VALIDITY AND RELIABILITY

As scientific inquiries, literature reviews should be valid, reliable, and repeatable

(Xiao, Watson 2017). To narrow down the searching results to the scope that can relate to the purpose of this literature review, inclusion and exclusion criteria were created and applied to the actual searching process. During the screening process of this literature review, the concepts of references were analyzed. Only those with related concepts about cardiovascular diseases are chosen regardless the field. To make sure the cited portions were understood objectively, the whole content of each article was internalized and criticized before citing or paraphrasing. If the cited portion was not from the researchers of the corresponding article, original source of citation was then traced and analyzed to make sure the citation remains reliable. If the original source cannot be traced, or the meaning was not well-kept during previous citing process, then the article was not included for referencing. Plagiarism was avoided through addressing the source of the obtained knowledge of findings. All citations were clearly quoted in this thesis with Harvard style. Reference list is attached at the end of thesis with all the cited articles.

10 ETHICAL CONSIDERATIONS

Out of 73 cited references, 27 articles involved with clinical trials or interviews. Ethical aspects were carefully inspected for the abovementioned 27 articles. All of the 27 articles are ethically accepted with following characteristics. Permissions were granted by corresponding institution or ethical committee. Subjects or respondents were approached, received formal explaining the purpose of the study. From which those who agreed to participate clinical trials or interviews signed a written consent form, making sure the participation was completely voluntary. Further questions were explained and participants were assured that they could withdraw at any time during the trial or interview without any penalty. Confidentiality of data collection was

addressed and reassured before signing the consent. Aside from the 27 articles which has actual participants, some other research articles have utilized statistical data from reliable and accountable statistical agencies with letters of approval. Plagiarism and copies were examined at databases.

11 CONCLUSION

This literature review is to increase awareness and knowledge of cardiovascular diseases among middle-aged people. In general, middle-aged people lack awareness and overall-to-specific understanding of cardiovascular diseases. They have insufficient knowledge and motivation in the matter of modifying their unhealthy lifestyle and behaviors. The needs may vary from one patient to another, which demands the healthcare providers such as nurses to fully understand and available information and materials and be ready to fill their knowledge gaps at any good chances. Patients' needs corresponding to CVD risks comes from two major categories, which are behavioral and metabolic risk factors. Health promotion topics are reviewed from various aspects, and nurses shall select significant ones towards a specific patient targeting specific needs exposed during assessment process. In a sense that best practices should be tailor-made for each unique patient. This study also demonstrated some teaching strategies based on previous research works, and further confirmed that cardiovascular diseases prevention can be effectively conducted through patient-centered communication, individual counseling, motivational interviewing, cardiac rehabilitation program, mobile health, telehealth, visual aids. During this process, nurses play an important role in identifying needs of patients, at the same time choosing the best ways to deliver information, providing answers to their questions, and enabling patients to take part in modifying their

behaviors and lifestyles for the ultimate goal of disease control and health promotion among middle-aged patients with CVDs.

12 DISCUSSION

Many of cardiovascular patients have insufficient awareness about their health, some of them didn't realize the importance of maintain a healthy level of cholesterol. Some of them live a sedentary lifestyle which further contributes to a higher risk of obesity. Some patients were surprised with their diagnosis of high blood pressure because they did not experience any abnormal symptoms. Patients do not always clearly remember or fully understand everything that was given to them for various reasons. When patients do not experience any bad feelings or abnormalities, they find it more difficult to understand why they should take action on cardiovascular disease prevention such as managing risk factors. Problems occur when patients did not follow agreed interventions, forgot follow-up visits, had low therapy compliance or they stopped taking prescribed medication before the ideal duration. Our findings suggest that health education about prevention and the guidelines is particularly important among middle-aged people. These findings suggest that these effective methods can be used as new and effective ways to implement interventions, provide disease prevention and education to patients, and solve some of the knowledge gaps.

It has been established the importance of facilitating patient communication and medication adherence as well as patient education and motivation. Therefore, better health education strategies are needed to elevate awareness for the patient's lifestyle behavior. It is important for people to have a sense of control over their

disease and life choices. Increasing their knowledge and teaching them skills to manage their cardiovascular disease helps to strengthen the sense of control.

Nurses should be prepared to accept alternative ways of providing support towards our patients and clients such as utilizing electronic devices and applications. Understanding patient needs and developing individualized strategies are the premises for a nurse to come up with best ways to plan and carry out secondary prevention for each middle-aged patient with cardiovascular disease.

Further studies are encouraged to explore new knowledge and innovative ways in health promotion on cardiovascular diseases for middle-aged population. Since current studies mostly focusing on the management of behavioral and metabolic risk factors, other modifiable risk factors such as psychological factors need to be explored and analyzed to come up with more complete strategies to control cardiovascular diseases.

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APPENDICES

Appendix 1. Searching process

Database:	Keyword(s):	Year Limit:	Searching Criteria:	Search Results:	Cited:
EBSCOhost	cardiovascular disease and quality of life	2014-2017	Academic Journals	1798	1
CINAHL Complete	primary prevention	2017	English	497	1
EBSCOhost	secondary prevention and cardiovascular disease and cost effective	2007-2017	English	96	2
SAGE journals	literature review	2016-2017	English	49041	2
SAGE journals	middle age and transition	2007-2017	English	22365	3
SAGE journals	Finland and alcohol and cardiovascular	2007-2017	English	686	1
SAGE journals	middle age and stress	2007-2017	English	31056	2
EBSCOhost	Hypertension and cardiovascular disease	2007-2016	English	4380	2
EBSCOhost	cardiovascular disease and overweight and obesity	2007-2017	English	586	3
EBSCOhost	Diabetes and cardiovascular disease	2007-2017	English	7064	2

EBSCOhost	cardiovascular disease risk factors and cholesterol	2007-2017	English	752	4
EBSCOhost	cardiovascular disease and smoking	2007-2017	English	2451	4
EBSCOhost	cardiovascular disease and exercise	2007-2017	English	1318	1
EBSCOhost	cardiovascular disease and physical activity	2007-2017	English	1589	3
EBSCOhost	cardiovascular disease and unhealthy food	2007-2017	English	13	3
EBSCOhost	cardiovascular disease and diet	2007-2017	English	2072	2
EBSCOhost	cardiovascular disease and unhealthy eating	2009-2017	English	9	2
EBSCOhost	cardiovascular disease and alcohol	2007-2017	English	867	4
EBSCOhost	cardiovascular disease and drinking	2007-2017	English	230	3
CINAHL Complete	cardiovascular disease and health education	2007-2017	English	484	5
CINAHL Complete	cardiovascular disease and teaching methods	2007-2017	English	30	3
CINAHL Complete	cardiovascular disease and health education methods	2007-2017	English	38	2
CINAHL Complete	cardiovascular disease and rehabilitation programs	2007-2017	English	164	3

CINAHL Complete	cardiovascular disease and knowledge	2007-2017	English	1367	4
CINAHL Complete	cardiovascular disease and best practices	2007-2017	English	93	2
CINAHL Complete	cardiovascular disease and health promotion	2007-2017	English	1181	3
CINAHL Complete	cardiovascular disease and secondary prevention and middle age	2007-2017	English	216	3