

One of the major diseases that affect the people globally is cardiovascular disease (Cao, Davidson, DiGiacomo, 2009). In Australia, this is still one of the major causes of death among the Australian population (Australian Institute of Health and Welfare, [AIHW], 2010). The government is working hard in lowering the incidence rate of Australians suffering from any circulatory system diseases. Nineteen percent (19%) of the Australian population or 3.7 million Australians have a cardiovascular condition (Australian Bureau Statistics, [ABS], 2007). It is worth mentioning that many Australians died because of cardiovascular diseases amounting to 45,670 deaths or 34% of all deaths (Australian Institute of Health and Welfare, [AIHW], 2009). The population of South Australia is 1,554,700 in which old people in the state comprise the largest proportion of the whole Australian population (ABC Health & Wellbeing, 2011). The emergence of cardiovascular disease in this area is projected to be increasing.

Specifically, the south-east region of South Australia closely deals with the increasing incidence of cardiovascular disease. The South-east region of South Australia has a population of 65,978 as of June 2009 (ABS, 2009). The region poses an elevated level of risk factors such as obesity, sedentary lifestyle and smoking which can lead to cardiovascular disease compared with the whole South Australian population (Mount Gambier Health Advisory Council, Mount Gambier and Districts Health Service, Country Health SA Hospital Inc., 2010). In 2007 to 2008, 12,701 individuals have circulatory

system disease which significantly increased compared to 11,394 in the year 2004 to 2005 (Public Health Information Development Unit, [PHIDU], 2008). There are predisposing and precipitating factors of the occurrence of the cardiovascular disease that must be addressed to completely eradicate the incidence of it. The nurse, as one of the health professionals, has a key role in helping the whole population in preventing the occurrence of such diseases. This essay will discuss the presence of biological determinants and its connection with the environment and behavioural factors of the cardiovascular disease among the whole population and the nurses' role in this point of view.

Health, as defined by World Health Organization, is a "state of complete physical, mental, and social well-being and not merely the absence of disease and infirmity" (Hood & Leddy, 2002 as cited in Smeltzer & Bare, 2004, p. 6). There are a lot of factors to consider why an individual is ill. These factors will be based on the different determinants of health. Health determinants, as defined by the AIHW (2010), are multifaceted factors that may have a positive or negative effect on one's health. These determinants may be changed through health care and other interventions. The health determinants include environmental, social, economic, lifestyle and biological. One of the determinants of health is biological. Biological determinants of health pertain to factors that affect a person's health by one's age, gender, genes and other living things that a person interacts (AIHW, 2010). These are the biological factors that may contribute or put at risk the health of each human being. For instance, in the

South east region of South Australia, the prevalence of cardiovascular disease in this area is worth noting to be one of the highest among the whole South Australia because it increases significantly compared to the number of individuals with cardiovascular disease in 2004 to 2005.

According to AIHW (2011), cardiovascular disease is a group of diseases and conditions which affects the human's heart and blood vessels. This includes coronary heart disease, stroke and heart failure. This kind of disease is prevalent in the whole Australia as well as worldwide. There are a lot of factors that cause a person to have a circulatory disease. One of which is classified in the biological determinants of health. The person's age, sex and genetics can be a factor in getting cardiovascular disease. In South Australia, males have a high incidence of cardiovascular disease compared to females (PHIDU, 2010). The prevalence of this disease is often high to the aged population (AIHW, 2011). A research conducted and concluded with support evidences that the genetic form and biological aspects of the health of each person have a huge impact in the overall health status especially in cardiovascular health (Sawatzky & Naimark, 2005).

The environment can still affect the humans' health. Environment refers to whatever surrounds the people such as the quality of water, food and air which are very important in human's existence (AIHW, 2010). It may also include the built environment where the people work and live (AIHW,

2010). Also, the emerging climate change and global warming that each person is experiencing will likely affect health (AIHW, 2010). For instance, the air pollution and exposure to chemicals in a certain place would trigger heart diseases. Air pollution can exacerbate a health condition due to release of pollutants in the air such as ozone, carbon monoxide and sulphur dioxide (AIHW, 2010). These pollutants can cause cardiovascular problems to the people. Motor vehicle emission can also be a source for air pollution (AIHW, 2010). The kind of environment that individuals use to live or the built environment can also be a determinant of health (AIHW, 2010). This includes the workplaces, recreation areas, schools and homes. People living in an urbanized place are most likely physically active due to its design wherein everybody can walk or use bicycles as a mode of transportation (AIHW, 2010). Thus, it prevents any health problems.

On the other hand, there are a lot of things that can affect the behaviour of each person when it comes to health. There are behavioural factors that can cause cardiovascular disease to an individual. These are tobacco use or smoking, excessive alcohol consumption, physical inactivity and poor nutrition (AIHW, 2010). Smoking is one of the causes why individuals develop atherosclerosis (Bakhru, & Erlinger, 2005). Thus, this is a major risk factor in the development of cardiovascular disease. If a person consumes a large amount of alcohol, there is a big possibility that the individual develops a health problem. This includes coronary heart disease, hypertension, stroke, inflamed pancreas and a

few cancers. (Irving et al. 2009; WHO 2002a as cited in AIHW, 2010). Sedentary lifestyle is also considered to be one of the causes of poor health. In 2003, physical inactivity is the second largest donor to the burden of disease and injury in Australia (AIHW, 2010). What a person eats everyday will reflect in the health and wellbeing. The food that an individual consumes daily has a great impact in health because food contains nutrients that would help a person become healthy. However, it depends on what food an individual eats. There are also foods which many people consider as “junk” wherein there are no nutrients in it, such as processed foods, that are patronized mostly among the whole population. Nutritional foods such as fruits and vegetables are less consumed by the majority of the population. Thus, this may lead to the emergence of health problem. In 2003, inadequate intakes of these foods were accountable for the 2.1% total of the burden of disease in Australia (AIHW, 2010).

Biological determinants of health can contribute to the environmental and behavioural factors of health to mankind and vice versa. These factors can be interlinked because health problems, for example, cause different factors that may lead to such situation. The major risk factors such as the environment and a person’s behaviour-causing circulatory system disease may have important connection with the genetic determinants of health (Friedlander, Kark, & Stein, 1985 as cited in Bakhru and Erlinger, 2005). For instance, air pollution as an environmental determinant of health is a major risk factor to the older population in getting cardiovascular disease. A study was conducted and found out that there is a

high incidence of cardiovascular problems connected with air pollution in New Zealand and Australia in the older population, aged 65 years and over (Barnett, Williams, Schwartz, Best, Neller, Petroeschevsky, Simpson, 2006). The exposure of the elderly on carbon monoxide and nitrogen dioxide causes serious cardiac condition. Also, more males are smoking than females. The largest population of individuals who smoke comes from the 20 to 59 age groups (AIHW, 2011). The females were noted to eat more fruits and vegetables than males (ABS, 2009d as cited in AIHW, 2010). Thus, males are more at risk in developing cardiovascular disease. Moreover, many individuals in the 45 to 54 age groups from South Australia are obese or overweight (Chittleborough, Caudle, Baldock, Taylor, Phillips, 2007). The elderly population aged 75 years old and over poses a higher percentage among the age groups with insufficient activity (Chittleborough et al., 2007). These results indicate that through the age and gender of an individual, a person can be at risk to have cardiovascular disease with the contribution of their health behaviours and environmental influences.

Nurses, as one of the health professionals, have key roles in dealing with these determinants of health. These health determinants must be given attention in delivering an appropriate approach in order to lower the incidence of cardiovascular disease among the whole population. Most often nurses are visible in the hospitals taking care of patients to help them get well and meet their individual needs. However, nurses can be also seen in the community setting in dealing the needs of each individual as a

whole. In the context of community setting, nurses have a vital role in giving duty of care. In dealing certain health problems for the benefit of the whole population, nurses can be educators (Hood, 2010). In this role, nurses can educate the whole population about health promotion and disease prevention. Through promoting health and teaching the community about disease prevention such as proper nutrition, immunisation and other health programs, many individuals were able to acquire a healthy lifestyle (Allan, Stanley, Crabtree, Werner, Swenson, 2005).

As a nurse educator, nurses must be able to teach and emphasise to the whole population the importance of good health and how to deal with such determinants in order to avoid any health problems in the future. For instance, cardiovascular disease is rampant among the whole population and many people are affected by it. The emergence of this disease is caused by various health determinants and risk factors which affect the people. These factors are smoking, poor nutrition, obesity, sedentary lifestyle and even air pollution. The modification of these factors plays a vital role in lessening mortality and morbidity rates of cardiovascular disease (Al-Omran, 2007; Chobanian et al., 2003 as cited in Wu, Deng, Zhang, 2011). Similarly, Sawatzky and Naimark (2005) stated that lifestyle modification is essential in promoting cardiovascular health and preventing occurrence of heart related diseases.

Moreover, Barnett et al., (2006), proposes that reducing the air pollution levels would improve the circulatory health of each person. In this perspective, nurses can play a role as a change agent. The nurse, as a change agent, improves work manner, and changes any public rules and regulations, or even the working environment in relation to health (Hood, 2010). In this role, nurses can also instill health education to the involved individuals. Thus, promoting health and preventing disease through public health education is the best way in lowering the mortality and morbidity of the disease and enhancing the value of health (Whitlock et al., 2002 as cited in Allan et al., 2005). Nurses can also collaborate with other health professionals in meeting the health needs of the whole population (Australian Nursing and Midwifery Council, 2006). There are health services offered in the community such as medical missions and free consultations conducted by general practitioners. Nurses must collaborate with other health professionals to become part of the health team to provide quality health care service, enhance health system and lessening the work of the general practitioner in dealing the health needs of the people (Halcomb, Davidson, Yallop, Griffiths, Daly, 2007).

Since then, population health has been used to give health care to individuals (Radzimirski, 2007). This framework is significant to the health professionals because they can deliver quality health services to the whole society. Population health pertains to the social, economic, physical and cultural environment that each individual used to live and toil (Craig & Smith, 1998; DeSouza, Williams &



Myerson, 2003; Singer & Ryff, 2001 as cited in Radzynski, 2006). Through this perspective, a nurse knows the context of the relations of macro-economy on health, the outcome of the actions given by the health care system in meeting the health needs of the individual, and the macro-level trends in health status (Radzynski, 2006). Nurses play a vital role in enhancing the health of the whole population through delivering excellent health services (Radzynski, 2007). Being a health educator and a change agent, a nurse is able to inculcate to the public the importance of health and emphasising disease prevention. Also, a nurse is well known in giving interventions to reduce the prevalence of certain diseases and improving the health in the community. Nurse in the population health perspective can be a coordinator for the health management of the whole society. As a coordinator, the nurse assumes the managerial duty towards maximizing the health of the community (Hood, 2010). Through this role, Nurse will measure the factors affecting health, plan interventions to regulate the health determinants of health, use or create regulations in relation to health and re-assess the overall health care system in a society (Radzynski, 2006). In the population health framework, nurses can identify the determinants of health and integrate disease prevention, environmental and cultural impact on health and health promotion among the population (Radzynski, 2006). Furthermore, nurses can use the context of population health in lessening the occurrences of diseases, sustained healthy life and improve life expectancy among the population (Radzynski, 2007). Truly, nurses are highly qualified to look after

the health of the population because through them, a healthy life and environment will be offered to the general public.

The determinants of health affect the lives of the people in all walks of life. These may have a positive or negative impact on the health of each person. The various determinants of health are interrelated because health problems consist of different factors which lead to such condition. Through the population health perspective, nurses can easily identify the causes of the existence and incidence of diseases among the whole population. The health professionals specifically nurses will be able to determine the factors that must be addressed in improving health and avoiding the occurrence of illness to the whole society. Nurses, in population health, integrate disease prevention and health promotion to the betterment of health of the community.

**REFERENCES:**

- ABC Health & Wellbeing (2011). Australia Health Map: South Australia. Retrieved from <http://www.abc.net.au/health/healthmap/sa/> on 23/05/2011
- Allan, J.D., Stanley, J., Crabtree, K., Werner, K.E., Swenson, M. (2005). Clinical Prevention and Population Health Curriculum Framework: The Nursing Perspective. *Journal of Professional Nursing*. 21(5). pp 259–267
- Australian Bureau of Statistics (2007). Australian Social Trends 2007. ABS catalogue no. 4102.0. Canberra: ABS
- Australian Bureau of Statistics (2008). 2006 Census Community Profile Series : South Australia. Retrieved from <http://www.censusdata.abs.gov.au> on 24/05/2011
- Australian Institute of Health and Welfare 2010. Australia's health 2010. Australia's health series no. 12. Cat. no. AUS 122. Canberra: AIHW.
- Australian Institute of Health and Welfare (2011). Cardiovascular disease: Australian facts 2011. Cardiovascular disease series. Cat. no. CVD 53. Canberra: AIHW.
- Australian Institute of Health and Welfare (2009). Cardiovascular disease in Australia Extracted from Impact of falling cardiovascular disease death rates bulletin. Canberra: AIHW

- Australian Nursing and Midwifery Council (2006). National Competency Standards for the Registered Nurse. 4<sup>th</sup> ed. Retrieved from <http://www.anmc.org.au> on 06/06/2011
- Bakhru, A., Erlinger, T.P. (2005). Smoking Cessation and Cardiovascular Disease Risk Factors: Results from the Third National Health and Nutrition Examination Survey. *PLoS Medicine*. 2(6). pp. 0528-0536
- Barnett, A.G., Williams, G.M., Schwartz, J., Best, T.L., Neller, A.H., Petroeschevsky, A.L., Simpson, R.W. (2006). The Effects of Air Pollution on Hospitalizations for Cardiovascular Disease in Elderly People in Australian and New Zealand Cities. *Environmental Health Perspectives*. 114(7). pp. 1018-1023
- Cao, Y., Davidson, P.M., DiGiacomo, M. (2009). Cardiovascular disease in China: an urgent need to enhance the nursing role to improve health outcomes. *Journal of Clinical Nursing*, 18, pp. 687–693
- Chittleborough, C., Caudle, L., Baldock, K., Taylor, A., Phillips, P. (2007). The Epidemiology of Cardiovascular Disease in South Australia. South Australian Department of Health. pp. 1-156
- Halcomb, E.J., Davidson, P.M., Yallop, J., Griffiths, R., Daly, J. (2007). Strategic directions for developing the Australian general practice role in cardiovascular disease management. *Contemporary Nurse*. 26. pp. 125-135

- Hood, L.J. (2010). *Leddy & Pepper's Conceptual Bases of Professional Nursing*. 7<sup>th</sup> ed. Wolters Kluwer Health/ Lippincott Williams & Wilkins. p. 5
- Mount Gambier Health Advisory Council, Mount Gambier and Districts Health Service, Country Health SA Hospital Inc. (2010). Mount Gambier Draft 10 Year Local Health Service Plan 2010 – 2019. Government of South Australia (SA Health). pp. 1-44
- Public Health Information Development Unit (2008). Social Health Atlas of South Australia 2008, Online Data: Health status and risk factors. Retrieved from [www.publichealth.gov.au](http://www.publichealth.gov.au) on 01/06/2011
- Public Health Information Development Unit (2010). Social Health Atlas of South Australian Local Government Areas, 2010. Retrieved from [www.publichealth.gov.au](http://www.publichealth.gov.au) on 01/06/2011
- Radzynski, S. (2006). Population Health as a Framework for Forensic Nursing Curriculum. *Journal of Forensic Nursing*. 2(1). pp. 33-41
- Radzynski, S. (2007). The concept of Population Health within the nursing profession. *Journal of Professional Nursing*. 23(1). pp. 37-46
- Sawatzky, J.V., Naimark, B.J. (2005). Cardiovascular Health Promotion in Aging Women: Validating a Population Health Approach. *Public Health Nursing*. 22(5). pp. 379—388
- Smeltzer, S.C., Bare, B.G. (2004). *Brunner and Suddarth's Textbook of Medical Surgical Nursing*. 10<sup>th</sup> ed. Hardback (USA): Lippincott Williams & Wilkins. p. 6

Wu, Y., Deng, Y., Zhang, Y. (2011). Knowledge, Attitudes, and Behaviours of Nursing Professionals and Students in Beijing toward Cardiovascular Disease Risk Reduction. *Research in Nursing & Health*. 34. pp. 228–240