Perception, Knowledge & Awareness of Coronary Heart Disease among rural Australian women 25 to 65 years of age – A Descriptive Study

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Signed Statement

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Abstract

Context: Heart disease is the leading cause of morbidity and mortality in Australian women. Traditionally, heart disease has been perceived as a man's disease, where as women's health issues have historically focused on menopause and breast cancer, leading women to believe that coronary heart disease is not an important health issue for them. Many Australian women fear cancer, although heart disease kills four times more women then breast cancer. The major risk factors for developing heart disease are the same for both men and women. These include hypertension, cigarette smoking, hyperlipidemia, diabetes, obesity, sedentary lifestyle, stress, age, heredity and race.

Purpose: The purpose of this study was to:

a.   Assess rural women's current level of awareness of heart disease as the leading cause of death in Australian women.

b.   Describe rural women's current knowledge and perception of cardiovascular disease as well as actual risk of cardiovascular disease, and

c.   Evaluate whether heightened awareness and increased knowledge is associated with increased action to lower risk of heart disease.

Method: A questionnaire combining questions from three existing questionnaires used in numerous other studies was developed to collect data on perception, knowledge and awareness of heart disease of rural women. The questionnaire was pre-tested in a pilot study with participants recruited from the researcher's workplace. The ethically approved and validated questionnaire was then distributed to rural women aged twenty five to sixty five attending a women's health clinic in a regional hospital over a seven-week period. Data analysis was performed using SPSS 15.0 for Windows.

Results: The study included sixty five women participants. Only 13% (n=8) of participants identified heart disease as the most significant health problem for women. Sixty four percent of women participating in the study reported that breast cancer claims more lives than heart disease. Despite having an overall good knowledge of

heart disease, there was an identified lack of health promoting behaviours by the women to reflect their knowledge. Less than half of the women who participated in this study recognised that they were at a higher risk of developing heart disease after menopause. Over half of the women participants of this study reported two or more lifestyle risk factors for heart disease. Self-reported risk factors such as hypertension, high cholesterol, cigarette smoking, alcohol use and obesity were consistent with national levels.

Recommendations: Although health professionals have advocated primary prevention of heart disease for many years, in general, are not heeding the message. Women must be educated to the fact that cardiovascular disease kills. It is evident from this study that women are inadequately educated about the health problem heart disease is for women. Nurses can play a major role in educating both the public and other healthcare providers about the very real danger of heart disease in women. Effective primary prevention of coronary heart disease requires early detection of risk factors, early intervention and communication of the relevance of the risk and the impact to women. Assessment and communication of risk is necessary as it can assist women in developing a more realistic perceived risk of coronary heart disease that, in turn, may motivate them to initiate and maintain healthy behaviours.

Conclusion: Women do not perceive heart disease as a substantial health concern. Programs directed at young women to develop means to improve women's perception of their risk for heart disease and to encourage them to act on their enhanced perception are required to reduce overall heart disease morbidity and mortality. Changing the misperception women have about their health problems includes increasing their knowledge that favourable changes in lifestyle can reduce cardiovascular risk factors and prevent cardiovascular disease and coronary heart disease. Lifestyle modifications can substantially alter morbidity and mortality from coronary heart disease.

CHAPTER 1 - INTRODUCTION

INTRODUCTION

This dissertation is the result of an investigation of Australian rural women's perception, knowledge and awareness of coronary heart disease. This study focused on rural women's awareness and perception of coronary heart disease and if this knowledge of risk factors influences lifestyle habits. This chapter introduces the reader to the study and specifies the research questions this study addressed. The significance of the study has been discussed along with an overview of the contents of each chapter.

CONTEXT OF THE STUDY

Diseases of the heart comprise a significant proportion of cardiovascular deaths. Historically, coronary heart disease (CHD) has been perceived as a man's disease.[1] Perhaps this misperception stems from the lack of cardiovascular research on women, less public education directed toward female-specific cardiac risks, or an inherent bias against women within the health care system resulting in decreased access to diagnostic and therapeutic interventions in cardiology. These convictions about cardiovascular disease being a man's disease have arguably permeated and impacted on nursing/midwifery education and subsequently the delivery of care by nurses and midwifes.[2]

Women's health issues historically focused on menopause and breast cancer, leading women to believe that coronary heart disease is not an important health concern for them. This has resulted in women not being adequately informed about the disease.[3] Modification of cardiovascular risk factors requires a change in lifestyle habits and behaviours. Knowledge and awareness of risk factors is an essential component of behaviour change, however there is little information on rural Australian women's knowledge and awareness of cardiovascular risk factors.

Many health care workers fail to discuss heart disease and associated risk factors with their female patients because they think it is primarily a man's disease or is less serious in women.[4] Recognition of the subtle differences between men and women with heart disease have been slow to gain acceptance and these gendered assumptions have had other secondary effects, including reinforcing the perception among women themselves that they are immune from the risks of developing heart disease.[2]

PURPOSE OF THE STUDY

Cardiovascular disease is the leading cause of morbidity and mortality in women in Australia,[5] yet prior research has shown a lack of awareness among women.[6] The purpose of this study was to evaluate the current awareness, perception and knowledge of heart disease among rural women aged twenty five to sixty five years. A major objective was to evaluate if increased knowledge and awareness equates to women choosing better lifestyle choices to reduce their risk of heart disease.

The objectives of this study were to:

a. Assess rural women's current level of awareness of heart disease as the leading cause of death in Australian women.

b. Describe rural women's current knowledge and perception of cardiovascular disease as well as actual risk of cardiovascular disease, and

c. Evaluate whether heightened awareness and increased knowledge is associated with increased action to lower risk of heart disease.

RESEARCH QUESTION

The research questions were:

a. Are rural women aware of their risk of heart disease?

b. What knowledge of heart disease do rural women have?

c. Does an increased awareness and knowledge of the causes of heart disease relate to better lifestyle behaviour in rural women?

SIGNIFICANCE OF THE STUDY

The results of this study will be used to provide nurses with contemporary knowledge about cardiovascular risk factors in rural women. Heart disease develops gradually and can easily go undetected.[7] Risk management strategies for women at a younger age may have a significant impact on disease progression.[8] Results from this study

will be useful in developing appropriate gender-specific messages to heighten heart disease risk awareness and to promote life-style changes to reduce risk.

RURAL HEALTH

Rurality can be described using the 'Remoteness Structure', based on the Accessibility/Remoteness Index of Australia (ARIA), developed by the Australian Department of Health and Ageing.[9]   ARIA measures the remoteness of a point, based on the road distances to the nearest town (service centre) in each of five population size classes. The principles underpinning ARIA are that larger towns have more services than small towns, and that remoteness is a factor of distances travelled to obtain services.[10]

Approximately one-third of Australia's total population of over twenty million live outside major urban centres.[10] The health disadvantages in rural Australia are well-documented, particularly in terms of access and availability of health-care services.[11]   Risk factors such as smoking, obesity, drinking and environmental dangers are more common in rural areas. Increased risk is also represented in high numbers of personal injury from accidents on farms, higher rates of hypertension, diabetes, asthma and high cholesterol.[12] The adverse effects of distance on access to services, lack of population growth in many communities, insufficient communication systems, response times, small population numbers and potential stigma from the greater visibility of circumstances exacerbate these risk factors.[13]

Australians living in regional and remote areas generally experience poorer health than their major city counterparts.[11] This is illustrated, most robustly, in measures of mortality. In 2002–04, death rates in regional and remote areas were between 10–70% higher than in major cities.[14] Non-metropolitan areas of Australia have a significantly higher mortality from cardiovascular disease than metropolitan areas, after taking into account any differences in the proportion of elderly people through age standardisation.[14, 15] Furthermore, more people outside metropolitan areas are hospitalised for heart disease and related complications. Part of this excess risk may be due to a higher prevalence of cardiovascular disease risk factors.[16]

CORONARY HEART DISEASE

Coronary heart disease (also known as coronary artery disease or ischemic heart disease) is the most common form of heart disease and results from atherosclerosis, or the accumulation of fatty plaques in artery walls that cause narrowing of the artery lumen.[17] Coronary artery disease that includes coronary syndrome, atherosclerosis, and other forms of chronic ischemic disease, is responsible for many deaths.[18] Chest pain, shortness of breath, heart attack or other symptoms can be caused by a blood clot or plaque rupture that blocks a narrowed artery leading to the heart.[19] The term 'cardiovascular disease' includes coronary heart disease, stroke, peripheral vascular disease and heart failure.[20]

BURDEN OF CARDIAC RISK IN WOMEN

Cardiovascular disease remains the leading cause of mortality and morbidity in developed countries, despite recent advances in diagnostics and treatment.[21-24] The Australian Institute of Health and Welfare[14] reports that coronary heart disease remains the leading cause of death in Australia. Heart disease has been a significant problem in terms of health and economic burden on individuals, communities and nations in spite of its steady decline since 1968.[14, 20]

Although the rate of cardiovascular deaths in men has declined over the last decade, the number of cardiovascular deaths in women remains unchanged or may even be increasing.[25] Women diagnosed with coronary heart disease experience higher morbidity and mortality than men.[26] Coronary heart disease accounts for the majority of cardiovascular deaths in women, disproportionately afflicts racial and ethnic minorities and is a prime target for prevention.[6] As coronary heart disease is often fatal, and nearly two thirds of women who die suddenly have no previously recognized symptoms, it is essential to prevent coronary heart disease.[6]

In 2006, 10,797 Australian women died of heart disease and 2,618 women died of breast cancer.[5] Australian women are four times more likely to die of heart disease than breast cancer and on average heart disease kills over two hundred women per week or thirty Australian women each day.[5] Although the onset of coronary heart disease in women typically starts ten to twenty years after it does in men, as the

population continues to age, and women live longer than men, this disparity in mortality between the sexes will continue to grow.[25]

Studies show that although there has been a decline in the overall mortality for heart disease, the incidence in women has been steadily increasing.[27, 28] Along with the higher cardiovascular mortality among women, the outlook for women who do survive a coronary event is inferior to men.[29]   One explanation for this less favourable outcome is that when women first experience a coronary event, they are older, and are more likely to have more co-morbidities, such as diabetes and hypertension, which in turn contribute to higher mortality rates.[26, 28]

The knowledge gap between women's perceived and actual risk of cardiovascular disease, particularly for younger and minority women,[6] is perhaps another explanatory factor for the poorer cardiovascular outcomes observed in women following an acute coronary event.[29] An Australian study showed that only three percent of Australians are aware that heart disease is the leading cause of death in women.[30] Evidence shows that women perceive breast cancer as a greater risk than heart disease.[26] Although the benefits of early identification and modification of cardiac risk have been well defined, women must first receive and understand the actual risks before they can act to make the appropriate choices that will result in the reduction of the risks.[31] Misconceptions may lead women to underestimate their risk for heart disease so that they fail to seek early interventions to prevent unnecessary morbidity and mortality.[26] While research in the area of heart disease risk perception is not abundant, existing information suggests that women often incorrectly perceive their risk and lean toward an optimistic bias.[32]

RISK FACTORS
Recent scientific data supports the strong relationship between the way a person or population lives and their risk for developing or dying from Heart Disease.[33] Genetics can be a major factor for some people, such as those with low-density lipoprotein cholesterol [LDL-C] receptor deficiency[34] and other risk factors such as increasing age and a family history of heart disease cannot be controlled. For most of the population, lifestyle is the major determinant of the risk of heart disease.[19] Data from the Framingham Health Study quantified risk on the basis of the presence of a

range of factors for heart disease.[35]   Although risk factors for heart disease are mostly the same for men and women, there are some differences.[36]   Women, as well as men have a greater chance of developing heart disease when they have multiple risk factors.[37]

The major risk factors for developing heart disease are the same for both men and women.   These include hypertension, cigarette smoking, hyperlipidemia, diabetes, obesity, sedentary lifestyle, stress, age, heredity and race.[17, 35]   Women are more likely than men to have multiple risk factors for coronary heart disease.[38]   Women's awareness of risk for coronary heart disease is not proportionate to its seriousness, and women fail to follow heart-healthy lifestyle practices.[39]   Heart disease is a multifactor process that is contributed to by a variety of biological and behavioural characteristics of the person.[34]   Women with a father or brother who developed heart disease before age fifty five or a mother or sister who developed heart disease before age sixty five are at increased risk.[19]   Race is also a factor, with black women more at risk of developing heart disease than white women.[19]   The majority of factors that contribute to heart disease include a number of well established and emerging risk factors such as smoking, sedentary lifestyle, obesity and diet.[34, 40]   These factors can be controlled or modified by making simple changes in lifestyle and, if necessary, taking certain medications.[19]   Women and health professionals need to recognise the existence of risk factors and the potential for developing future cardiovascular risk.   Ongoing cardiovascular risk assessment should be a part of each female patient's medical care.[41]   Interventions aimed at lifestyle changes such as regular exercise, cholesterol-lowering dietary changes and smoking cessation are recommended to reduce the chance of having a first or recurrent heart attack.[23, 42]

LIFESTYLE AND CARDIOVASCULAR DISEASE
Starting as a child, many actions a person takes in daily life combine to establish much of their lifetime risk for developing heart disease.[34]   Leon [43] found that even *in uteri,* exposure to the mother's environment or lifestyle can influence the future risk of heart disease of the embryo or foetus. Many of these lifestyle factors are prevalent in Westernised or technologically advanced cultures, in which required daily physical activity is low because of widespread automation, calorie-dense but nutrient-poor food is readily available at a relatively low cost, psychological stress

and social isolation is common and chronic exposure to cigarette smoke is still a common occurrence.[34]   While various lifestyle factors can initiate the atherosclerotic process early in life,[44] long-term exposure leads to the clinical manifestations of coronary heart disease, peripheral vascular disease and stroke.[34]

Lifestyle interventions are a top priority for prevention of heart disease in women.[45] All women should be encouraged not to smoke, to avoid environmental smoke and to get at least thirty minutes moderate exercise (ie brisk walking) on most and preferably every day. A heart-healthy diet is recommended, that incorporates a variety of fruits, vegetables, grains, fish and legumes and is low in saturated fat and cholesterol. Weight control should be encouraged to achieve a body mass index (BMI) between 18.5 and 25 kg/m2 and a waist circumference < 80 cm for females.[23, 30, 45]

DIABETES

Diabetes increases the risk of heart disease in women more than it does in men.[46] Data from the Framingham Heart Study[47] found that the relative impact of diabetes on cardiovascular mortality is greater in women than in men. This represented a doubling of overall risk compared with men without diabetes and a fivefold increase for women.[48] This may be due to these women with diabetes more often having added risk factors, such as obesity, hypertension and high cholesterol.[49] Diabetes is more likely to be associated with elevations in both systolic and diastolic blood pressure in women than in men.[48] Weight gain, even of a modest degree, increases the risk for type 2 diabetes and heart disease in women.[48] The increase in coronary heart disease risk in women with diabetes has since been confirmed in other epidemiological studies.[50] There is in fact, concern that with the alarming increase in the prevalence of diabetes, the prevalence of coronary heart disease mortality is also increasing, particularly in women.[48]

The risk of developing coronary heart disease increases as well as the long term mortality is higher in women with diabetes, as diabetes eliminates the usual female advantage for coronary disease mortality.[49, 51-54]   Women with diabetes also experience more adverse outcomes after a vascular event as following a myocardial infarct, mortality is greater in diabetic women.[48]

The rapid increase in the prevalence of type 2 diabetes and its occurrence at a younger age is primarily due to increased calorie intake and reduced energy expenditure and the resulting increase in adiposity.[55]   While heredity can influence a person's inclination to development of the disease, sedentary lifestyle and long term obesity are key triggering events for most people.[34]   Diabetes poses the greatest risk of developing coronary heart disease than any other factor.   Studies have shown that women with diabetes have seven times more cardiovascular events than other women, and approximately half died of coronary heart disease.[46, 56]   Although women usually develop heart disease about ten years later than men, diabetes erases any premenopausal protection, so their risk of developing coronary heart disease equals that of men their age.[17] Half of all deaths in patients with type 2 diabetes are due to heart disease, with the majority of these being related to ischemia.[46] Health studies have shown that women with diabetes had a three to seven fold greater risk of cardiovascular events than did age-matched control subjects.[54, 57]   Preventing diabetes in the first place is the ideal means of reducing coronary heart disease in women.[41, 46]

HYPERTENSION

Hypertension (elevated blood pressure) is a major modifiable risk factor for cardiovascular disease, cardiovascular events and death.[58] The relationship between blood pressure and cardiovascular disease control has been shown to be effective in reducing cardiovascular disease and morality, although below expectations from observational evidence.[59] Women with hypertension have a much greater risk of coronary heart disease than women or men with normal blood pressure.[17] Hypertension is more common in women who take oral contraceptives, especially those who are overweight, and the prevalence of hypertension increases with age.[17, 46]

High blood pressure, especially high systolic blood pressure, is the best predictor of heart disease.[60]   Optimal blood pressure for the general population is less than 120/80 mm Hg. In patients with proteinuria >1g/day with or without diabetes, the goal blood pressure is 125/75.[46, 60] Recent Australian studies have found that just over twenty five percent of Australian women twenty five years and over have high blood pressure.[61]

CIGARETTE SMOKING

Cigarette smoking causes more preventable deaths from cardiovascular disease than any other modifiable risk factor.[32, 46, 49, 62] Cigarette smoke contains a number of components that contribute to the initiation or progression of atherosclerosis or trigger clinical events.[34] Cigarette smoking is the single most potent risk factor for atherosclerosis.[48] Nicotine increases myocardial oxygen demand by increasing heart rate and blood pressure as well as some increase in myocardial electrical instability. Carbon monoxide reduces the oxygen carrying capacity of the blood by binding to the oxygen receptors.[34] Other various chemicals appear to have a direct effect on the initiation and/or progression of the atherosclerotic process and contribute to increased platelet aggregation. Smokers have low levels of high-density lipoprotein cholesterol (HDL-C) which tend to increase by about ten percent soon after smoking cessation.[63] Along with lung cancer and chronic obstructive lung disease, the increased risk for heart disease contributed by cigarette smoke exposure is dose-dependent.[34] Women who smoke one or more packs of cigarettes daily have a coronary heart disease risk that is two to four times higher than that of non-smokers.[62] Even women who smoke only a few cigarettes per day double their risk for heart disease compared with non-smoking women.[64] While many smokers may discount the increased personal risk they face from continued smoking, smokers who quit reduce their risk of CHD and prolong their lives substantially.[32, 46, 62] Studies consistently show that smokers continue to deny their own personal health risks from smoking.[32, 65] Australian studies show that sixteen percent of women smoke daily.[66]

Women who spend a lifetime of smoking, even a few cigarettes a day, are at greater risk of coronary heart disease than men who do not smoke. Women who take oral contraceptives and smoke are more likely to have a Myocardial Infarction (MI) or stroke than those who do not.[17] Overall, the prevalence of smoking is declining, but more slowly in women than in men. In Australia, daily smoking rates for women are only marginally behind men, with the prevalence of daily smoking for men at 18.6% and women following closely with 16.3%.[67] Women should be encouraged and aided in their smoking-cessation efforts by whatever means are required. They need to understand that low-tar or low-nicotine cigarettes are unacceptable from a cardiac-health perspective.[46, 62] This is because most of the health damage caused

by smoking comes from the non nicotine constituents, carbon monoxide.[68] Smoking cessation reduces the risk for heart disease substantially after only one to two years of abstinence, and after ten to fifteen years of abstinence, the risk approaches that of a non-smoker.[64]

NURTRITION AND HYPERLIPIDEMIA

A person's diet appears to play a central role in their long-term risk of heart disease. Much of the focus from the 1950s to the 1990s was on the contribution diet made to the levels of total cholesterol or LDL-C, however it is now realized that this relationship is only one aspect of the contribution of diet to heart disease.[34] Beneficial components in the diet include dietary fibre (especially water-soluble fibre), a wide range of antioxidants, B vitamins (B6, B12, and Niacin), folic acid, omega-3 fatty acids, calcium and potassium. Minimizing intake of foods high in saturated fat, trans-fatty acids, calories and sodium are also beneficial.[69] An important foundation for heart disease prevention and management includes an eating pattern that contains a high proportion of calories from a wide variety of vegetables, whole grains, fruits, and nuts and frequent consumption of fatty fish, with limited intake of high-fat animal products and processed foods containing trans-fats.[34]

Oestrogen helps to protect a woman from heart disease by increasing HDL ('good') cholesterol and decreasing LDL ('bad') cholesterol.[46] After menopause, women have higher concentrations of total cholesterol than men, although this does not entirely explain the sudden rise in heart disease risk after menopause.[70] Elevated triglycerides are an especially powerful contributor to cardiovascular risk in women. Low LDL and high triglycerides appear to be the only factors that increase the risk of death from heart disease in women over age 65.[71] The Framingham Heart Study (ongoing since 1948) has shown that women with high total cholesterol levels are twice as likely to develop coronary heart disease as other women.[33] Large amounts of cholesterol in the LDL fraction were atherogenic, whereas that in the high-density lipoprotein (HDL) fraction was protective. Low levels of HDL cholesterol (HDL-C) and high triglyceride levels are a stronger predictor of coronary heart disease mortality in women than men.[17, 46] Oestrogens affect lipids and other risk factors therefore hormonal protection for heart disease wanes as women move into their postmenopausal years. As a result, heart disease risk in women gradually increases to

equal that of men.[46] Since levels of HDL-C may drop, and those of LDL cholesterol (LDL-C) may rise, greater vigilance for dyslipidemia is warranted.[71]

PHYSICAL ACTIVITY

Along with good nutrition and not smoking, maintaining a physically active lifestyle appears to be a core component in the prevention of heart disease.[34] Studies have reported that more physically active or fit men and women have a substantially lower risk of heart disease and all-cause mortality than do their less active counterparts.[72-74] Physical activity impacts upon metabolic and other pathways which affect cardiovascular risk factors. It improves plasma lipid profile, reduces body weight, lowers blood pressure, reduces platelet aggregation, increases fibrinolytic activity, improves cardiac function, improves cardio-respiratory fitness and lowers the resting heart rate. [48, 75, 76] Studies have also shown that exercise training improves endothelium–dependent vasodilation, as well as increasing urinary sodium excretion and insulin sensitivity. [77, 78] Physical activity also positively affects the psychosocial well being of the individual.[79] A Finnish study [75] showed that regardless of other risk factors that may be present, moderate levels of physical activity were associated with a reduced risk of premature cardiovascular disease and mortality.

Physical activity can decrease a woman's risk by half and may significantly decrease the risk of a second MI in a post-menopausal woman who has already had one event.[17] In 2004-2005, Australian women were more likely than men to report being sedentary or having very low levels of physical activity.[80] The Australian Heart Foundation recommends that light to moderate activity, such as walking 30 minutes several (at least three) days a week, can decrease a woman's risk of heart disease.[23] Multiple short (10 minute) bouts of exercise in the form of brisk walking produces similar changes in cardio respiratory fitness and weight loss to that achieved with regimens involving longer, less frequent intervals.[48]

OBESITY

Obesity research today is in its infancy, at a stage comparable to lipid research twenty years ago.[81] Obesity is the most obvious manifestation of the global epidemic of sedentary lifestyles and excessive energy intake.[82, 83] Epidemiological studies

have shown that obesity is a serious risk factor for heart disease, on a par with cigarette smoking, physical inactivity and high blood pressure.[82, 84]   Where previously, obesity was thought to augment other risk factors, in the past ten years, obesity has been included as a major risk factor.[81]   The effects of obesity on cardiovascular health and disease are many – in particular hypertension.[84] Estimates from population studies suggest that seventy five percent of hypertension can be directly attributed to obesity.[85]

In Australia, the prevalence of obesity has more than doubled in the past twenty years.[82]   Seventeen percent of Australian women are reported to be obese, compared to sixteen percent of men.[86]   The Australian Heart Foundation recommends that a health waist circumference is less than 80 cm in women and less than 94cm in men.[60]   The optimal BMI is <25 kg/m^2 (BMI, equal to weight in kilograms divided by height in meters squared [BMI=kg/m^2]).[17, 60]   As the research on this 'new' risk factor for heart disease is in it infancy, the solutions are less clear.   Few drugs exist to prevent and treat obesity, and certainly there are no drugs comparable to the 'statins' to reduce high blood cholesterol.[81] Since so few effective strategies exist to help people who are already obese lose weight and maintain a healthier weight, the key to decreasing obesity may be prevention. Prevention has become even more important because of the increasing prevalence of obesity in children and adolescents.[81]

ALCOHOL
There has been much observational data published to support a link between moderate alcohol consumption (1-2 drinks per day) and decreased incidence of coronary heart disease. Moderate alcohol consumption can improve the lipid profile and interfere with platelet aggregation. This data is far from convincing. Higher levels of alcohol intake have shown that cardiovascular disease protection is outweighed by other alcohol-related causes of death and overall mortality increases.[87]   The pattern of consumption may indicate other confounding factors such as lifestyle and diet. For example, wine drinkers tend to have lower body mass indexes, exercise more frequently and consume alcohol only with meals.[46]

Chronic alcohol intake is also associated with adverse effects such as foetal alcohol syndrome, cardiomyopathy, hemorrhagic stroke, hypertension and arrhythmias.[88] Because a given amount of alcohol causes higher blood levels in women than in men, the Australian Heart Foundation recommends that women consume no more than one standard drink per day.[60] Overall, little evidence justifies promoting the consumption of alcohol.

Chronic alcohol intake has been associated with adverse effects such as cardiomyopathy, arrhythmias and hypertension. As any given amount of alcohol raises blood levels of alcohol more in women than in men, women are advised to consume no more than one drink per day. There is limited evidence to justify the promotion of the consumption of alcohol by women.[71, 88]

OUTLINE OF THE STUDY

This chapter has introduced the reader to the reported study and provided an overview including the background to the study, the purpose of the study and statement of the research questions as well as the significance of the study.

The second chapter will report on previous research in relation to women and heart disease. This chapter researches the problem of heart disease in women throughout the world, in particular Australian women.

Chapter three will detail the research method used for this study. The methods of data collection and analysis including ethical considerations will be discussed. Issues of validity and reliability will also be addressed.

Chapter four will present the study findings in relation to participants' awareness and perception of risk factors of coronary heart disease and whether this increased awareness and knowledge of heart disease relate to health promoting behaviour in rural women.

The final chapter will discuss the findings of the study with reference to existing literature and will highlight new knowledge derived from the study and the

significance to clinical practice. Strengths and limitations of the study will also be discussed. Finally, recommendations for future research will be provided.

SUMMARY

Many Australians continue to view cardiovascular disease as a man's illness, when in fact, on average thirty Australian women each day are dying from heart disease. Many Australian women fear cancer, however heart disease kills four times more women then breast cancer. Lifestyle is a major determinant of the risk of heart disease. Modifiable risk factors include diabetes, smoking, hypertension, nutrition, hyperlipidemia, physical activity, obesity and alcohol. These risk factors can be controlled or modified by lifestyle changes. As heart disease develops over many years, women need to be aware of the modifiable risk factors in order to follow healthy lifestyle practises and reduce their chance of a first or recurrent heart attack. Due to limited access and availability of healthcare in rural areas, people living in rural Australia are at greater risk of heart disease. This study aims to assess rural women's current awareness and perception of heart disease and evaluate if a greater awareness and knowledge equates to increased health promoting behaviour.

CHAPTER 2 – LITERATURE REVIEW

INTRODUCTION

A critical part of any research project is the literature review. This is because it evaluates the existing knowledge concerning the proposed area of research and then highlights any gaps existing in the knowledge where further research can occur to address the knowledge deficit.[89] In this chapter, a review of the literature pertaining to the question of rural women's awareness, perception and knowledge of heart disease will be presented. Findings related to the relationship between health beliefs and health behaviour has been presented and commented on in respect to the significance to women and heart disease.

SEARCH TIME SPAN AND DATABASES

A comprehensive search of electronic databases and bibliographies of relevant journals was undertaken. Databases accessed electronically included Cumulative Index of Nursing and Allied Health Literature (CINAHL), PsychINFO, Academic Search Premier, Google Scholar and PubMed databases. The search included only articles written in English from early 1985 to June 2008.

SEARCH TERMS

Key search terms included: women, heart disease, coronary artery disease, coronary heart disease, perceptions, perceived risk, cardiac risk factors and risk misconception. Each word or phrase was used singly or in combination. The objective of the search was to retrieve a range of literature related to awareness, perception and knowledge of heart disease in women. Consequently, information was selected on the basis of its content and relevance to the topic being researched.

HEART DISEASE RISK

Despite recent advances in diagnostics and treatment, cardiovascular disease remains the leading cause of mortality and morbidity in developed countries.[21, 23] Although there has been a decline in overall mortality of cardiovascular disease, the incidence in women has been steadily increasing.[4, 5] Despite the quantity of information available to women about risk factors for coronary heart disease, many women do not perceive

this risk as a life threat to them. Cardiovascular disease is the primary cause of death in women in the western world.[6-8]   American studies show that heart disease accounts for more than five hundred thousand deaths per year.[22]   An average of thirty women die each day in Australia from heart disease.[5] Despite these statistics, surveys show that women are not aware of these issues and underestimate the magnitude of this risk.[6, 41]

Improving women's awareness is important because perceptions of risk for heart disease may influence behaviours and actions related to heart disease prevention.[90] As women get older, they rank heart disease higher on the list, but at no point is it their primary concern.[39] Although over the past two decades, death rates from coronary heart disease in men have been decreasing, this has not been the case for women.[41]

A MAN'S DISEASE
The knowledge gap between women's perceived and actual risk of cardiovascular disease, particularly for younger and minority women, is one explanation given for the poorer cardiovascular outcomes observed in women following an acute coronary event.[6]   Historically, coronary heart disease has been perceived as a man's disease and for a long time women were not included in cardiovascular research programs.[1, 3] Coronary heart disease dates back as early as the writings from the Ebers papyrus (cited Wenger[27]) 2600BC, translated as,

> "*If you find a man with cardiac discomfort, with pain in his arms at the side of his heart, death is near.*"

The next 5000 years ensured more advantageous outcomes for both men and women. William Heberden in his classic 1768 treatise on angina pectoris (cited Wenger[27]) wrote,

> "*I have seen nearly a hundred people under this disorder, of which number there have been three women…All the rest were men near or past the fiftieth year of their age.*"

Later, a 1960s American Heart Association conference in Oregon on women and cardiovascular disease was titled 'How can I help my husband cope with heart disease?' The initial presentation of the American Heart Association's Prudent Diet was a public education pamphlet titled 'The Way to a Man's Heart.'[27] Perhaps this misperception stems from the lack of cardiovascular research on women, less public

education directed toward female-specific cardiac risks, or an inherent bias against women within the health care system resulting in decreased access to diagnostic and therapeutic interventions in cardiology. These convictions about cardiovascular disease being a man's disease have arguably also permeated and impacted on nursing education and subsequently the delivery of care by nurses.[2]

THE FRAMINGHAM HEART STUDY

The Framingham Heart Study has contributed importantly to understanding the causes of coronary heart disease, stroke and other cardiovascular diseases. Framingham research has helped define the quantitative and additive nature of these causes or, as they are now called, 'cardiovascular risk factors'.[33] Cardiovascular risk factors are generally divided into two main categories: those that can and those that cannot be modified.[35] Modifiable or partially modifiable risk factors include smoking, elevated cholesterol level, lack of exercise, obesity, hypertension, and diabetes. Non modifiable risk factors include a family history of cardiovascular disease, gender and age.[91] The Framingham Heart Study provides an opportunity to describe the lifetime risk of developing coronary heart disease in a community-based sample, with the population well described, careful documentation of events due to coronary heart disease and causes of death recorded. The study describes the lifetime risk of coronary heart disease for men and women free from coronary heart disease events at different ages.[92] The major risk factors studied extensively at Framingham included cigarette smoking, hypertension, high serum cholesterol and various cholesterol fractions, low levels of high-density lipoprotein (HDL) cholesterol and diabetes mellitus.[33] Factors other than those listed as major risk factors increase the likelihood for developing coronary heart disease. Among these, that were studied at Framingham or elsewhere, are obesity, physical inactivity, family history of premature coronary heart disease, hypertriglyceridemia, small low-density lipoprotein(LDL) particles, increased lipoprotein (a) (Lp[a]), increased serum homocysteine, and abnormalities in several coagulation factors. Despite the potential importance of these other factors, they are not included in the Framingham risk charts for both theoretical and practical reasons.[33]

HEALTH BEHAVIOR

As already stated, lifestyle behaviours such as cigarette smoking, sedentary lifestyle, obesity and diet are all factors that have been identified as placing women at an

increased risk for the development of heart disease.[17, 35]   An important factor in many preventative health behaviours is the perceptions of personal risk for a disease.[93]   Perceived risk of heart disease has been studied in light of many theoretical frameworks, most notably the Health Belief Model, developed by Rosenstock[94]. The health belief model suggests that an individual is likely to take a recommended health action if:

   a. the person perceived himself or herself vulnerable to getting the disease
   b. the person perceives that getting the disease as serious
   c. the benefits of a recommended health action outweigh the barriers of this action.[95]

Basically, individuals must perceive themselves to be at risk of a health threat before they will take actions to reduce risky behaviours or to engage in healthy alternative behaviours.[93]   The lack of perceived risk among women along with the lack of information dissemination impacts on preventative behaviours practiced by women.[8] In several studies, perceived vulnerability was determined to be an indicator for an individual's willingness to participate in risk-reducing behaviours for the prevention of heart disease.[96, 97] A ten year study, spanning thirteen European countries, of the relationship between health beliefs and behaviours among adolescents, showed a correlation between a weakening of health beliefs, such as the dangers of smoking, and the prevalence of unhealthy activities.[98] The factors leading to perceived health risk are important to understand in order to mobilize women to engage in behaviours linked to the reduction of cardiovascular disease.[8]

Not only does perceived risk of cardiovascular disease positively relate to the desire to make risk-reducing behaviours, it also relates to actual behaviour change.[97, 99] The belief that symptoms are cardiac in origin has been related to quicker care and utilizations of health services after symptom onset.[100] Personal risk perceptions of an acute myocardial infarction have been found to influence both the beliefs about the nature of the situation and subsequent responses during a cardiac emergency, along with preventative health behaviours to reduce the risk of having a cardiac event.[101] Women's perceptions of their risk for heart disease can greatly influence their decision-making process in regard to healthcare decisions. The general public still perceives heart disease as primarily a health problem for men. [26]   Evidence shows that women perceive breast cancer as a greater risk than heart disease. This may lead

to women underestimating their risk of heart disease and fail to seek early interventions to prevent unnecessary morbidity and mortality.[26, 101]

WOMEN'S AWARENESS OF HEALTH

Women's health issues have historically focused on menopause and breast cancer, leading women to believe that coronary heart disease is not an important problem for them. This has resulted in women not being adequately informed about the disease.[3] As already stated, during the 1950s to mid 1960s, information for women focused on how women could take care of the hearts of their husbands. While the focus continued to be primarily on men, during the mid 1960s to the 1970s, information appeared relating to prevention, risk factors and warning signs.[102]

More recent studies in America have shown that awareness and knowledge about heart disease affecting women has increased progressively from 1997 to 2003 among women across all age groups, with a tendency for older women to have more awareness and knowledge of heart disease than younger women.[6, 103] Despite this trend, only half of women are aware that heart disease is their leading cause of death, and awareness among ethnic minorities who are at greatest risk, lag behind Caucasians.[6] Many women are far more afraid of breast cancer than of heart disease, even though one in twenty eight deaths among women is due to breast cancer and almost one in two to heart disease.[104]

A US study reported that forty four percent of women surveyed believed that it was somewhat or very unlikely that they would suffer a heart attack, and fifty eight percent believed they were as likely or more likely to die of breast cancer than heart disease.[105] Three quarters of these women rated themselves as fairly or very knowledgeable. Of those women who saw a physician regularly, just over half of them reported that their physician never spoke to them about heart disease. Many of the women were aged over sixty years. Despite the gain in awareness of the public health problem of heart disease among women, it is not known whether this greater awareness has led to greater personalization of risk, improved lifestyles or enhancement of other preventative behaviours that might lower their risk.[90]

The REACT (Reassessing European Attitudes about Cardiovascular Treatment) survey assessed public perception of cardiovascular risk.[106] Five thousand members of the public participated in interviews conducted in five European Countries (France, Germany, Italy, Sweden and the UK). Only one third of the participants correctly identified heart disease as the leading cause of death worldwide. In each country, people were more likely to identify cancer as the leading cause of death. Thirteen percent reported that they were at high or very high risk of heart disease and thirty two percent identified their risk as low or very low. This contrasted with thirty seven percent of the participants who had two or more risk factors, placing them at high risk. The discrepancy between reality and perception in this study applied to both men and women.[106]

An American study concluded that women of all ethnic and age groups have suboptimal knowledge about cardiovascular disease risk factors despite the fact that there are well established methods of lowering risk.[107] In the study of a community of two hundred low-income women, examining the prevalence of heart disease risk factors and the level of awareness of and attitudes toward risk, each of the eight established risk factors was identified by four to thirty four percent of the subjects.[107] In contrast, only forty-five percent of the women with a specific risk factor reported that they were at increased risk because of the presence of that factor.

Kirkland et al[108] used data from the Canadian Heart Health Surveys to determine knowledge and awareness of cardiovascular risk factors among 2419 women 55 to 74 years old. Women with heart disease risk factors such as smoking and hypertension were less aware that these were risk factors for heart disease than women without these factors. In addition, women with high cholesterol levels were less aware that this was a major cause of heart disease. Women who have heart disease risk factors may not know the significance of these characteristics and that they place them at risk.[109] Biswas, Calhoun, Bosworth and Bastian[110] studied 328 female veterans 35 years and older. Despite each participant possessing at least one heart disease risk factor (smoking, hypertension and diabetes), not one perceived herself at risk of heart disease.

General knowledge and awareness of a potential health hazard may be a necessary first step in taking action to reduce the threat of disease nevertheless this may not be

sufficient. Perceived personal susceptibility has been shown to increase prevention-seeking behaviours.[96] Oliver-McNeil and Artinian[3] examined the perception of personal cardiovascular risk and risk reducing behaviours among suburban women. Most of the women failed to identify personal cardiovascular risk factors, despite their health record revealing risk factors for heart disease. There was no relationship reported between higher levels of education and increased knowledge of coronary heart disease.

More recently, Arslanian-Engoren[111] found that despite efforts by the American Heart Foundation, women still continue to conceptualize heart disease as a male disease and primarily rely on the personal experiences of male family members and popular media to shape their understanding of heart disease. While their study differed from Oliver-McNeil[3] in that community dwelling women were able to identify personal risk factors for heart disease, findings were consistent with a previous study [8] that women still perceive heart disease as a man's disease and men are at a higher risk from heart disease than women. Women still do not view heart disease as the number one killer of women.[111]

Other surveys have also indicated that many women are unaware that they have symptoms of early heart disease or that they possess risk factors for developing heart disease.[102, 112] King et al[113] studied perceptions of cardiovascular risk in women undergoing a coronary angiography. The majority of women in King's study (83.6%) had three or more risk factors. One third of these women recalled being told that they were at risk of cardiovascular disease although did not view their risk factors as placing them at risk of developing cardiovascular disease. This study illustrates that women fail to perceive cardiovascular disease as a personal threat. In another study of 105 patients hospitalized because of a myocardial infarction or coronary angiographic findings of coronary heart disease,[91] 79% of subjects were able to identify at least one of three modifiable risk factors, it was noted that only seven percent could identify all three factors. When evaluating knowledge of hyperlipidemia, Czeizel Kalina and Williams[114] found only seven percent of women and five percent of men had previous knowledge of their high cholesterol levels.

YOUNG WOMEN AND THEIR AWARENESS OF HEART DISEASE

While there has been some research on heart disease in older women, less has been published on the amount of adequate information about heart disease relayed to young people.[7, 8, 103, 115] In 1995, Pilote and Hlatky[103] reported results from a random survey of 337 women, aged 48 to 52 years, who graduated from Stanford University between 1967 and 1971. The authors noted that seventy three percent of the participants perceived their risk of developing heart disease by age 70 years as less than one percent, and twice as many women reported being worried about breast cancer (59%) as to heart disease (29%).[103]

Vale[7] found that adolescents have some knowledge of behavioural strategies to prevent heart disease, but lack the knowledge necessary to carry out specific prevention methods. For instance, numerous adolescents identified eating a healthy diet as a method of prevention, except most failed to accurately identify the components of such a diet. The conclusions drawn from this study are limited, because of the nature of the survey instrument, which included only five open-ended questions and the small sample size. Frost[115] conducted a much larger study with over one thousand participants reporting that despite the tact that college students have a high general base of knowledge about the risk factors of heart disease, only a few engage in preventative behaviours.[115]

Collins et al [8] explored college students attitudes about heart disease risks and preventative strategies. This study found that students overall had relatively low levels of knowledge about heart disease and associated risk factors compared to other health issues. The study established that educational intervention was necessary to increase college students knowledge about heart disease to address common misconceptions, in particular in women and minority groups.[8] In a recent survey of 470 undergraduates at two universities, 68% of participants thought that their risk of heart disease was lower or much lower than that of their peer.[31] Although heart disease develops over a lifetime, studies that have included younger women have been limited.

IMPACT OF RISK FACTOR MODIFICATION

Risk factor modification practices in women are difficult to evaluate from the current empirical reports because generally previous research has targeted men, and included

only a small percentage of women in the sample.[116] The largest study on lifestyle practices in women to date comes from the Nurses' Health Study.[117] This study found that women who practiced health promoting behaviour consistent with a low risk for heart disease had an 83% lower incidence of coronary events. Health promotion behaviour was defined as a lifestyle that included a good diet (high in fibre and low in trans fat and glycemic load), moderate exercise, a Body Mass Index lower than 25 kg/m^2, no smoking, and moderate alcohol consumption. The study found though that few women actually adhere to such a health lifestyle, and only three percent of the participants were in this lowest risk group.[117]

Participation in preventative strategies would be influenced by women's perception of the relative risks of developing heart disease, and beliefs about the effectiveness of the particular strategy.[40] Even with some improvements in knowledge, patient acceptance of and adherence to preventative recommendations remain suboptimal.[101]

INCIDENCE OF HEART DISEASE IN RURAL AUSTRALIA
The largest proportion of the Australian population is aged between 25-64 years. In 2004, this comprised 53% of the total population, with equal percentages of men and women. The disease process has begun for many women. Coronary heart disease is a major cause of mortality in women in Australia, with women being five times more likely to die from heart disease as from breast cancer.[118] From 1997-1999, those who lived in rural areas were up to 1.5 times more likely to die than people who lived in major cities. Twenty three percent of these excessive deaths were due to heart disease.[118]

The National Health Priority Areas (NHPA) initiative is a collaborative effort involving the Australian Commonwealth Government, state and territory governments. It seeks to focus public attention and health policy on those areas that are considered to contribute significantly to the burden of disease in Australia, and for which there is potential for health gain.[119] Cardiovascular health represents one of the highest burdens of disease and illness across Australia and as such is one of the seven national health priorities that have been set by the Australian government.

A 2006 study by Aldridge and Crawford recognized cardiovascular health as an important issue in the Mid North of South Australia.[120] Heart disease was identified as the highest contributor to the total mortality burden for this region, with a mortality rate higher than the rest of the state. Mackenzie, in 2007[121] emphasized that cardiovascular diseases accounts for one third (32%) of mortalities in Country Health SA residents and as such are the main cause of the mortality burden. It was also the principle diagnosis for hospital separations from Country Health SA hospitals in 2005-2006. Health disparities in vulnerable populations, including rural groups needs to be reduced.[122]   Therefore it is beneficial to Rural Australian women to have an awareness of the risk factors associated with coronary heart disease and the knowledge necessary to modify these risk factors.[7]

ECONOMIC BURDEN OF HEART DISEASE

Although there have been considerable advances in medical science, cardiovascular disease (CVD) continues to impose a financial burden on Australians.[123] Cardiovascular disease remains the major public health problem in Australia and is the leading cause of mortality and disability. One Australian dies every ten minutes from cardiovascular disease and one in three families are directly affected by cardiovascular disease.[5] CVD accounted for 46,134 deaths (35% of all deaths in Australia) in 2005. It is also one of the leading causes of disability, with around 1.4 million Australians (6.9% of the population) estimated to have disability associated with cardiovascular conditions.[61] In the 2004–05 National Health Survey, about 19% of those surveyed reported one or more long-term diseases of the circulatory system, corresponding to 3.7 million Australians. The prevalence of CVD was significantly higher in females (55%) than in males (45%). Comparing males and females after adjusting for differences in age structure, females were 10% more likely to have CVD (19,449 females per 100,000 versus 17,439 for males).

Combining both the burden from premature death and the extent of its disability, CVD was estimated to account for 18% of the overall disease burden in Australia in 2003, with coronary heart disease and stroke contributing over four-fifths of this burden.[124] Most of the cardiovascular burden was due to years of life lost (YLL) to premature death and they represented 29% of total YLL for Australia in 2003. Years of 'healthy' life lost due to poor health or disability (YLD) arising from CVD

accounted for 8% of Australia's total YLD in 2003. The cardiovascular burden increases markedly with age, particularly from 60 years onwards.

CVD is the most expensive disease group in terms of direct health-care expenditure, at $5.9 billion, which is 11.2% of the health system's expenditure in 2004-05 that can be reliably attributed to various diseases. CVD is one of the leading causes of disability and death in Australia. Combining both the burden from premature deaths and extent of associated disability, cardiovascular disease was estimated to account for 17% of the overall disease burden in Australia in 2003.[118] CVD is the most expensive disease group in terms of direct health care expenditure, at over $5.5 billion, this represented 11% of Australia's total allocated health system expenditure in 2000-01.[119] The National Heart Foundation of Australia[125] noted that limiting risk factors for heart disease also reduced the incidence of other diseases. The report looked at seven risk factors for heart disease; high blood pressure, high cholesterol, high body mass index, low fruit and vegetable consumption, physical inactivity, alcohol and tobacco use. These modifiable risk factors not only contributed to heart disease, but also other associated illnesses such as renal failure, diabetes, osteoarthritis and some forms of cancer. These seven modifiable risk factors account for over two-thirds of cardiovascular deaths and disease burden and represented a formidable amount of potential health gain.

GAPS IN THE LITERATURE
Women's knowledge of their risk factors for heart disease needs to be studied further and reported. Whilst women remain unaware of their risk, they are unlikely to adopt healthy lifestyles and reduce the incidence of cardiovascular disease mortality and morbidity. It has been postulated that perception of personal risk for a disease such as cardiovascular disease is enough motivation for women to adopt preventative behaviours and prevent serious illness.[101] On the other hand, other factors that influence personal risk, such as demographics and knowledge about the disease, may not necessarily lead to an alteration in behaviour.[95] Although women are more informed about heart disease, current educational programs have been less than effective in convincing women to adopt healthier lifestyles.[29] Evidence from the literature indicates women continue to underestimate their risk of cardiovascular disease despite available information. This lack of knowledge about heart disease and

its risk to women is concerning given that in rural areas, risk factors such as smoking, obesity and hypertension are at higher levels than in metropolitan areas.[120] These factors do not exist in isolation and warrant further investigation if we are to overcome women's knowledge gap between their perceived and actual risk for cardiovascular disease.[29] Understanding women's knowledge of risk factors and health-promoting strategies is crucial because heart disease can be prevented or delayed if women practice appropriate risk factor modifications.

SUMMARY

This review has provided a brief overview of some of the pressing factors that influence women's perceived risk of cardiovascular disease. There appears a need to build awareness of the magnitude of heart disease in women within the community. It is important to determine what rural Australian women believe about heart disease, their health behaviours and risk factor knowledge. More effective prevention programs where inhibitors and enablers have been addressed and community capacity built to sustain the initiatives can then be introduced that would then lead to a reduction in cardiac risk and disease progression in women through health promoting behaviour and choices.

CHAPTER 3 - METHODS

INTRODUCTION

This chapter discusses how the study was conducted and how the study plan was implemented. The methodology for the study has been described to include the study design and setting, selection of participants, development of the research tool, ethical issues and data analysis.

THE RESEARCH DESIGN

An explorative descriptive design was used to determine the perception, knowledge and awareness of heart disease in rural Australian women. The aim of this method was to portray phenomena through description, relationships between behaviours, individuals or events can be seen, and relationships between variables better understood.[126]

In an exploratory descriptive design, a questionnaire or interview would typically be used to collect data. The decision to collect data through a questionnaire or interview requires careful thought as several factors such as available resources, time constraints, sample size and geographical dispersal need to be taken into account.[127] Questionnaires are advantageous as they allow the inclusion of large samples from different geographical areas and the data can be collected quickly with minimal cost.[128] Interviewing however, is a flexible technique that has a higher response rate in comparison to using a questionnaire.[127] Interviews may be problematic though, as researcher interference may be reflected in the subject response and interviews can be time consuming and costly, especially with large samples.[127, 128] It is for this reason that authors recommend using a questionnaire to eliminate interviewer bias and to enhance subjects' anonymity, especially where the survey asks sensitive questions.[128] Therefore, the decision to conduct either a survey questionnaire or an interview is based on the situation in which the research is being conducted. A questionnaire was chosen in the reported study due to expediency, being relatively quick, economical and simple to analyse.[89]

There are various techniques commonly used to disseminate questionnaires. Distribution by post is the traditional technique because can be relatively inexpensive.[127] However, it can become costly when the sample size is large and where funds are needed for postage and printing.[128] After some thought, taking into account advantages and disadvantages of techniques possible for collecting the data for this study, a self enumerated questionnaire was chosen rather than a face-to-face interview. All benefits were considered in light of the time constraints of completing a Masters Dissertation.

STUDY SETTING

Located on the eastern side of the Spencer Gulf, alongside the Southern Flinders Ranges, Port Pirie is the centre of the upper Mid North region of South Australia. Port Pirie was the first provincial city in South Australia and its major industry continues to be the Nystar Lead Smelter, which is the largest lead smelter in the Southern hemisphere. Port Pirie is also renowned for its international port. The region surrounding Port Pirie is recognised nationally for its mixed farming and cereal production and the population for Port Pirie and surrounds is approx seventeen thousand.[129]

Port Pirie Regional Health Service is a modern, well equipped ninety three bed health unit. The health service consists of two main acute wards catering for medical, paediatric, surgical, obstetric, high dependency and private admissions, as well as an aged care area that includes a Palliative Care unit, respite beds and day programs.

The Accident and Emergency Department has facilities for treating medical and surgical emergencies. Within this area are consulting rooms for visiting specialists and other clinics. It is within this area that the Well Women's Clinic provides its service for Port Pirie Women and also women from the surrounding Mid North area

THE WELL WOMEN'S CLINIC

The Well Women's Clinic operates two and a half days a week, Monday, Thursday and Tuesday afternoon. The service is offered to women who reside in the area that present with a range of health issues including sexual health, breast health, menstruation, menopause and genitourinary health. The clinic is staffed by hospital employed Registered Midwives who also work in an antenatal clinic at other times of the week.

These nurse/midwives provide education, health promotion, consultation, assessment, screenings (eg pap smears) and referral, as required, for six to eight women each day, with the majority of women being within the target age group for this study. Due to the popularity of the clinic, it has been able to offer appointment times up until 7pm to allow working women to access the clinic.

RECRUITMENT STRATEGIES

The two registered midwives at the Well Women's Clinic who were involved in the survey were instructed by the researcher in the recruitment process of potential participants. The nurse/midwife asked each woman who met the inclusion criteria, attending the clinic within the survey period, if they would like to participate in the study. A letter introducing the researcher, providing information about the study and inviting women to participate was provided to each participant (Appendix 1). The return of the completed questionnaire, which was attached to the letter, was deemed informed consent by the woman to participate. Participants were informed that they could choose not to participate in the study without compromising any future medical treatment within the health unit. Contacts for information on the project and independent complaints procedure also accompanied the letter (Appendix 2).

Process

As women who initially present to the clinic are required to complete a clinic questionnaire which primarily asks about their medical and sexual health, it was decided that participants would be given the study questionnaire to complete in their own home at their convenience. A self-addressed, stamped envelope was provided to return the completed questionnaire to the researcher. The questionnaire took approximately 15 minutes to complete and did not have to be completed in one sitting. All clients who presented to the clinic and who met the inclusion criteria were offered questionnaires by the Registered Midwife working in the clinic on that day, for subsequent unassisted completion. Since participation in the study was not part of the standard procedure of the clinic, return of the questionnaire was entirely voluntary. Participants were not paid for their participation in this study or offered any inducements. Data collection was carried out over a seven week period from 30 June until 15 August 2008.

Sample

The inclusion criteria included women who presented to the clinic within the time of the survey aged twenty five years to sixty five years of age. Exclusion criteria included women who did not have the language or literacy skills to enable them to answer the questionnaire or who were outside the age range.

INSTRUMENTS

The data collection tool (questionnaire) was developed to test the perception, knowledge and awareness of coronary heart disease in rural women (Appendix 3). To increase the tool's validity, questions from previously implemented health surveillance surveys were applied.[104, 130, 131] The questionnaire was divided into three sections.

Section one contained three questions that questioned participants' awareness of women's health issues. These questions replicated questions used in previous American Heart Association surveys relating to women's awareness of heart disease.[6, 39, 104, 132]

Section two contained twenty five true/false questions from the *Heart Disease Fact questionnaire-2* (HDFQ-2).[131, 133] The HDFQ-2 is a 25-item cognitive measure of coronary heart disease risk factor knowledge and the link between diabetes and coronary heart disease. This measure tool contains true/false questions that were developed to assess participants' knowledge of major risk factors for the development of Coronary heart disease. Risk domains assessed included family history, age, gender, cigarette smoking, physical activity, glycemic control, lipids, blood pressure, weight, and whether a person necessarily knows if heart disease is present.[131] Questions 4 and 30 in this section were also taken from the surveys used in section one.[6, 104, 132]

Section three contained twenty two questions from the Behavioural Risk Factor Surveillance System (BRFSS) Questionnaire, which is in the public domain from the Centres for Disease Control and Prevention (CDC).[134] This section gathered data to assess participants' personal health status including co-morbidities, medication,

weight, blood pressure, exercise, cholesterol, tobacco use, alcohol consumption and demographic characteristics.

PILOTING OF TOOL

The questionnaire was pre-tested in a pilot study with participants recruited from the researcher's workplace. Twelve participants matching the inclusion criteria for the study completed the questionnaire. The purpose of the pilot study was to determine the interpretability of the questions, identify potential data processing problems and estimate the length of time a respondent would take to complete the questionnaire.[89] All participants indicated that the instrument was clear, understandable and imposed little burden and they were able to complete the questionnaire within fifteen minutes. Based on the results from these participants, a number of minor adjustments were made to the original version of the questionnaire. One question that had originally been omitted from the *Heart Disease Fact Questionnaire* was added and a question relating to health history was reworded.

INSTUMENT RELIABILITY AND VALIDITY

Questions measuring knowledge scores were adapted from three separate surveys.[104, 130, 131] While this current survey was not tested for content validity or reliability, the adopted knowledge questions were from surveys that had been repeated with consistent results over a time span of many years and have been well reported. Stability and consistency of results can be considered measures of reliability.[128] This also allows for a sound comparison measure for the results obtained and could contribute to these studies on an ongoing basis. Adaptation of other validated health questionnaires increases validity of the study and will be discussed further.

Wagner et al [131] examined the reliability of the HDFQ-2. They found that the HDFQ-2 is readable to an average thirteen year old, imposed little burden and demonstrated content and face validity. Additionally it demonstrated adequate internal consistency, with Kuder-Richardson-20 formula = 0.77 and good item-total correlations. The measure of heart disease risk knowledge is brief, understandable to participants and easy to administer and score.[131] Chyun et al also established validity of the *Heart Disease Fact Questionnaire*–2.[133] Stability of the instrument was demonstrated by test-retest reliability (*r = 0.89*) and internal consistency reliability. Cronbach α was r = .84 for Chyun's study.[133] This was consistent with

the reported study as Cronbach α was r = 0.85. Internal reliability refers to the extent to which the questionnaire is consistent within itself. That is, how consistently the questions within each section measure the knowledge constructs and overall heart disease knowledge. The Cronbach's alpha statistic indicates the consistency of responses to all items in the questionnaire. Cronbach's alpha values range from 0 to 1, and a score of 0.7 or above is generally acceptable.[127]

A review of results from numerous other studies suggests that most measures included in the BRFSS are both reliable and valid.[135, 136] Nelson et al[135] found that most of the measures used in the BRFSS were moderately to highly valid and reliable. When compared with census data, BFSS data have minimal bias, indicated by the consistency between the demographic profiles of the state-specific BRFSS sample and the state population.[137] Bias estimates in 2000 were lower compared with BRFSS data collected in 1995, when the response rates were higher.[130] In addition, when compared with other surveys the BRFSS data is reliable and valid.[135] A group of state coordinators and personnel from the CDC developed questions for the BRFSS. The questionnaire has been used extensively and several studies have examined empirically the reproducibility of the BRFSS.[134] In 2004, the CDC convened an expert panel to provide recommendations for enhancing the validity and reliability of the BRFSS.[130] Among the panel's recommendations were investigating the feasibility of mailing the survey to participants and documenting the response rate.

ETHICAL ISSUES
Approval to conduct this study was received from the University of Adelaide Human Research Ethics committee number H-057-2008. The study was supported by the Port Pirie Regional Health Service Director of Nursing/Midwifery and the Clinical Services Co-ordinator of the Well Women's Clinic.

Participants were informed of the purposes of the study and assured that confidentiality would be maintained. All subjects were invited to participate on a voluntary basis. The researcher at no time had access to participants' names or contact details. As the questionnaires were distributed by the nurse/midwife rostered in the clinic anonymity was assured. The questionnaires did not include names or addresses of participants. The completed surveys were taken to the researcher's home, the sealed envelopes

broken and the surveys filed in a folder within the nominated age group in preparation for data extraction. The surveys were stored in a locked cupboard. The surveys or results of any individual survey were not shown or discussed with any person. Any information that may identify an individual participant would not be recorded or published.

Hard copy and electronic data related to this survey has been securely stored with the surveys to prevent unauthorized access or disclosure. Electronic data was saved to a device with appropriate security safeguards such as password protection, unique identification of authorized users, antivirus controls, firewall configuration and scheduled and automatic backups to prevent against data loss or theft. On completion of the study all records will be stored in secure archives at the University of Adelaide for a period of five years.

MEASURES

General awareness of women's health issues was measured in the first three questions. All participants were asked to identify the leading cause of death in women from a list including cervical and breast cancer, arthritis, diabetes and heart disease. They were also asked two true/false questions about heart disease for women in Australia (question 2) and whether breast cancer claimed more lives in Australia than heart disease(question 3).[101] Question 4 and 29 were true/false questions about the development and detection of heart disease.

Questions 5-28 and 30 in section two measured women's knowledge of heart disease using the HDFQ-2. This is a 25-item cognitive measure of coronary heart disease risk factor knowledge and the link between diabetes and CHD. [131, 133] Each true/false question that was correctly answered was scored as 4 points, for a maximum possible score of 100, indicating a higher level of knowledge. Any questions that were either unanswered or unsure were scored as incorrect. The risk domains assessed by these questions included family history, age, gender, cigarette smoking, physical activity, glycemic control, lipids, blood pressure, weight and whether a person necessarily knew if heart disease had been detected.

Questions 31-52 measured women's risk of heart disease using the BRFSS. The BRFSS is a telephone survey designed to determine health risk behaviours of adult Americans ages 18 and above. The survey is administered annually by state Departments of Public Health under the auspices of the CDC. The BRFSS was developed in 1984 to provide a way to track CVD risk factors on a state-by-state basis. Cardiovascular disease remains the leading cause of morbidity and mortality in Australia, therefore the capture of critical measurements of cardiovascular health is a major priority. BRFSS also measures screening practices and awareness of potential health threats, such as high cholesterol and hypertension. Six cardiovascular risk factors were examined. Participants reported whether they were ever told by a doctor, nurse or other health professional that they had high blood pressure or high blood cholesterol levels and self reported if they smoked cigarettes or drank alcohol, if they were overweight and whether they exercised.

Question 31 asked participants their age by category.

Question 32 asked participants to rate their general health in response to the question 'Currently your general health is Poor/Fair/Good/Very Good/Excellent'. This variable was coded from 1 to 5 with 1 indicating excellent and 5 indicating poor health.[101]

Questions 33 – 35 asked participants if they have a history of illness and if they are taking any prescription medication. Ten illnesses were listed and were given independent variables; consequently, participants were able to indicate more than one illness. Medications were coded according to the class they belonged to. Classes included antihypertensive, antiarrhythmnic, antianginal, hypolipodaemic, hypoglycaemic, anticoagulant, diuretic, thyroxine, respiratory drugs, hormone replacement therapy, herbal and other drugs. Drugs were placed in each class using Mims Annual[138] as a reference. The classes were chosen due to their relationship to the treatment and management of heart disease and the risk of heart disease. Diabetes was considered present if the participant stated they had a history of diabetes or was under treatment with insulin or oral hypoglycemic agents.

Question 36-38 asked participants about their weight. Participants were asked, 'How would you assess your own weight?' The response categories were 'underweight',

'acceptable or healthy', and 'overweight'. This variable was coded from 1 to 3 indicating 1 for underweight and 3 for overweight. This was followed by the question, 'To answer the above question, how did you assess your weight?' The response categories were 'comparison to others'; 'clothing size'; 'clothing fit (loose or tight)'; 'body mass index'; 'how you feel'; 'opinion of others'; and 'other' in which they were asked to state what other ways they assessed their weight. Participants were also asked 'Has your weight changed in the last 12 months?' and the response categories were 'increased'; 'decreased'; or 'no change'. These questions were also used in an awareness of risks of overweight study among rural Australians.[139]

Blood pressure was measured by participants' response to the question "Have you ever been told by a doctor, nurse or other health professional that you have high blood pressure?" The answer to this question was used to categorize them as being hypertensive or normotensive.[140]

Leisure-time physical activity was measured by the participant's indication of partaking in exercise (e.g. running, callisthenics, golf, gardening or walking) other than their regular job during the preceding month. Participants were considered to have a sedentary life-style if they answered no to this question.[137]

Questions 43-45 asked participants about blood cholesterol. Participants were asked if they had ever had their cholesterol checked and if so, if it was checked during the preceding 5 years. High cholesterol was determined by an affirmative answer to the question, 'Have you ever been told by a doctor, nurse, or other health professional that your blood pressure is high?

Questions 46-48 asked participants about tobacco use. Smoking status was self reported and classified in 3 categories: never-smoker, ever-smoker, and current smoker. [141] Smoking status was determined by asking participants, 'Have you smoked at least 100 cigarettes in your entire life?' and do you now smoke cigarettes every day, some days, or not at all?' Current smoking was defined as having smoked 100 or more cigarettes during a person's lifetime and currently smoking every day or some days. Smoking habits were classified according to three categories: never smokers, ex-smokers and current smokers.

Alcohol consumption was measured with four questions. The first asked whether at least one drink of any alcoholic beverage such as beer, wine, a malt beverage or liquor, had been consumed in the past thirty days. Women who responded negatively to this question were defined as abstainers. Three questions were used to quantify usual alcohol use: frequency of drinking occasions, average quantity of alcohol as well as how often they would consume six or more drinks on one occasion. Binge drinking was defined as having five or more drinks on at least one occasion during the preceding month. Heavy drinking was defined as an average of one or more drinks per day for women during the month preceding the survey.

Cardiovascular risk factor risk status was classified as high, intermediate, or low based on the presence of cardiovascular risk factors. Cardiovascular risk factors include self-reported current cigarette smoking status (yes/no), history of dyslipidemia, and history of hypertension. Participants were classified as 'high risk' if they volunteered a history of diabetes, or if they answered yes to the question, have you ever been told by the doctor you have high blood pressure or high cholesterol? Participants were classified as 'intermediate-risk' if they had at least two cardiovascular risk factors and participants were classified as 'low risk' if they had one risk factor or no risk factors.

STATISTICAL ANALYSIS

Data were entered into the Statistical Package for Social Sciences 15.0 for Windows and checked for accuracy.[142] The questions relating to the *Heart Belief Fact Questionnaire*-2 were tallied by correct response and totalled. The scores were recorded on a Microsoft Office Excel Spreadsheet. Surveys were recorded on the spreadsheet by use of the identifying number and age group followed by the score. After all the surveys were recorded, the surveys were rescored manually and scores documented on individual surveys prior to being compared with the spreadsheet to ensure no errors occurred in manual calculation of scores or recording of data on the excel document. Knowledge scores were based on the number of correct answers to true/false questions with the highest score being 100.

Univariate descriptive statistics examined sample characteristics. Nominal data were summarised in terms of frequencies and continuous data summarised by calculating

percentages, mean scores and standard deviations. The median and mean as measures of central tendency[143] were drawn upon to summarise certain aspects to of the result

SUMMARY
A self-enumerated written questionnaire was applied to collect data on perception, knowledge and awareness of heart disease of rural women. The questionnaire included questions from three existing questionnaires used in numerous other studies. Reliability and validity were established. The ethics approved questionnaire was distributed to women aged twenty five to sixty five attending a women's clinic in a regional hospital over a seven week period. Data analysis was performed using SPSS 15.0 for Windows.

CHAPTER 4 - RESULTS

INTRODUCTION

This chapter presents findings of the study investigating rural women's awareness, knowledge and perception of coronary heart disease. There were three objectives of this study:

1. To assess rural women's current level of awareness of heart disease as the leading cause of death in Australian women;

2. To describe rural women's current knowledge and perception of cardiovascular disease as well as actual risk of cardiovascular disease and

3. To evaluate if greater awareness and knowledge of coronary heart disease affects lifestyle habits.

Descriptive statistics such as frequency distributions and measures of central tendency and dispersion were used to analyse the data in ways to give meaning and facilitate insight.[89]

In accord with the layout of the questionnaire, the results have been presented in three sections. The first section will present the results of participants' awareness of heart disease as the greatest health problem for Australian women. Section two will present the results of the questions taken from the *Heart Disease Fact Questionnaire-2*[131, 133], measuring coronary heart disease risk factor knowledge. Section three will present findings from self reported data of participants' personal health status including co-morbidities, medication, weight, blood pressure, exercise, cholesterol, tobacco use and alcohol consumption. The data has been presented in numerical as well as text terms. The tables have demonstrated comparison scores, descriptive statistics, correlation studies and collective data.

STUDY POPULATION AND VARIABLES INVESTIGATED

The study sample consisted of women from Port Pirie and Districts who presented to a Well Women's clinic. Women presented to this clinic with a range of health issues including contraception, breast health, menstruation, menopause and genitourinary health but not necessarily for cardiac health issues. Ninety-three women were

approached to participate in the study over a seven-week period, and sixty-eight of those women returned the questionnaires. This is a response rate of seventy three percent, which was a good response rate given that response rates to questionnaires is not always high.[143] Of those returned, two were found to be invalid as they did not meet the age selection criteria. A further two were found to be incomplete. One was discarded as it was found there was insufficient data to enable the questionnaire to be included in the analysis. The other questionnaire had sufficient responses for inclusion to some of the questions. Two other surveys answered more than one answer to question 1 and so could not be used in the analysis of that question. Questionnaires were given a unique identifying number prior to analysis by the researcher. The valid response rate for the study was 65 (70%) questionnaires providing data for analysis (Figure 1).
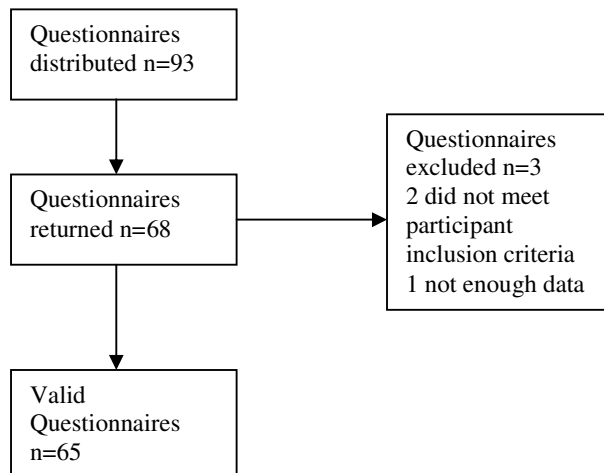
Figure 1 Flow chart of responses to questionnaire

DEMOGRAPHIC CHARACTERISTICS

The sample consisted of women aged between 25 and 65 years. Age data was assigned into four age groups, 25-34, 35-44, 45-54 and 55-65 years. Among the participants, 20 (31%) were aged between 25-34 years, 10 (15%) were aged between 35-44 years, 15 (23%) were aged between 45 and 54 years and 20 (31%) were aged between 55 and 65 years (Table 1).

Table 1 Age groupings of participants

	n	%
25-34 years	20	30.8
35-44 years	10	15.4
45-54 years	15	23.0
55-65 years	20	30.8
Total	65	100.0

SECTION ONE: Questions 1 – 3 WOMENS HEALTH ISSUES

PERCEPTIONS OF DISEASE

The distribution of all responses to the first question concerning the greatest health problem for women is shown in figure 2. Of the 63 women who completed the full survey, 24 (38%) noted cancer and 28 (44%) reported breast cancer as the greatest health problem for women, whereas only 8 (13%) reported heart disease. The remaining 3 (5%) thought cervical cancer was the greatest health problem. There were no responses indicating diabetes was the greatest health problem for women. These results will be discussed in the next chapter.

Greatest health problem
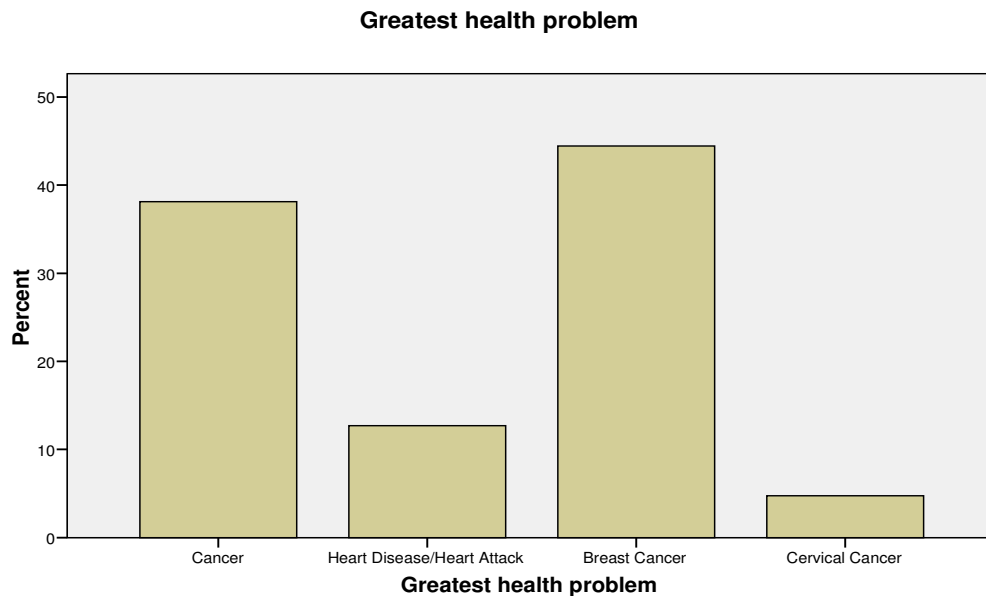
Figure 2 Distributions of participants' perceptions regarding the greatest health problem facing women today

Question two was a true/false question asking women if coronary heart disease is the most common cause of death in women in Australia. Overall 63 women answered the

question, only 17 (27%) of the participants knew that coronary heart disease is the most common cause of death in women in Australia. Of those remaining, 44 (70%) answered false to this question and 2 (3%) either stated or were unsure. Question three was a true/false question asking women if breast cancer claims more lives than heart disease and was answered by 64 women. Over half the women, 41 (64%), believed that breast cancer claims more lives than heart disease, 21 (33%) did not believe that breast cancer claims than heart disease and 2 (3%) either stated or were unsure.

SECTION TWO: Questions 4 - 30 HEART DISEASE KNOWLEDGE

HEART DISEASE

Question four asked whether it was true or false that heart disease develops gradually over many years and can easily go undetected. Overall 64 women answered the question, and 58 (91%) knew that heart disease answered this question correctly. Incorrect responses came from the younger and older age groups, with two incorrect responses in the younger women aged 25-34, and three incorrect responses and one unsure in the older women aged 55-65.

Questions 5-28 and 30 were 25 true or false questions taken from the *Heart Disease Fact Questionnaire*-2 (HDFQ).[131, 133] These questions related to heart disease and diabetes. The scores were recorded on a Microsoft Office Excel Spreadsheet. Knowledge scores were calculated by giving a value of four to each respondent's correct answer. Scores on this study ranged from 52 (13 correct) to 100 (25 correct). The mean score was 84 (84%; SD, 9.94) indicating that women in this study had a reasonable knowledge of coronary heart disease. These results were negatively skewed as eighty percent of participants sampled scored 80 and higher. Results according to age group are listed in Table 2. Table 3 is the list of questions most often answered correctly. The questions not listed in Table 3 and Table 4 were answered correctly by over 70% of the participants. Table 4 gives the questions that were most often answered incorrectly. Unfortunately, the majority of the sample did not recognize that age is a risk factor for heart disease (Table 4). Women aged 35-44 were the only age group where the majority of women, 7 of 10 participants (70%) recognised that the older a person is, the greater risk of having heart disease. A higher percentage of women in the 45-54 year age group, nine of 14 participants (64%),

recognized that men with diabetes are more at risk of heart disease than women, than participants in the other three age groups. Women of all age groups did not know that people with diabetes tend to have low HDL (good) cholesterol, suggesting that women's overall understanding of cholesterol may be poor.

Table 2 Heart Disease Fact Questionnaire results

	Age Group in Years				
	25-34 (n=20)	35-44 (n=10)	45-54 (n=15)	55-65 (n=20)	Total (n=65)
Mean	83	85	81	85	84
Median	84	92	84	84	84
Minimum	56	60	52	76	52
Maximum	96	96	96	100	100
Range	40	36	44	24	48
Standard Deviation	10.48	12.48	11.79	5.96	9.94

Table 3 Top ranked correctly answered questions from Heart Disease Fact Questionnaire

	Correct Response (N=65)	
Question	n	%
Smoking is a risk factor for heart disease	63	96
High blood pressure is a risk factor for heart disease	64	99
High cholesterol is a risk factor for developing heart disease	64	99
Being overweight increases a person's risk for heart disease	65	100
Regular physical activity will lower a person's chance of getting heart disease	62	95
Only exercising at a gym or in an exercise class will lower a person's chance of developing heart disease	62	95

Table 4 Top ranked incorrectly answered questions from Heart Disease Fact Questionnaire

	Correct Response (N=65)	
Question	n	%
The older a person is, the greater their risk of having heart disease	28	43
People with diabetes tend to have low HDL (good) cholesterol	13	20
Men with diabetes have a higher risk of heart disease then women with diabetes	33	51

Question 29 asked the true/false question of women about their risk of heart disease after menopause. Less than half of the participants were able to correctly identify that women are more likely to acquire heart disease after menopause. Of the 65 participants, less than half, 30 (48%) answered that women were more likely to get heart disease after menopause. Four (6%) of the women were unsure of the answer to this question. Women in the 55-65 year age group were more likely to correctly identify that women are more likely to get heart disease after menopause compared with all other age groups.

SECTION THREE: *Questions 32 - 52 HEALTH AND HEALTH RELATED BEHAVIORS*

PERSONAL HEALTH STATUS

Question 32 asked women to self assess their general health as 'Excellent', 'Very Good', 'Good', 'Fair' or 'Poor'. Subjective health ratings were suggestive of reasonably good health. Of the 65 participants, 52 (80%) rated their health as 'Good to Excellent', while 13 (20%) reported 'Fair to Poor' health. Interestingly, 6 (30%) of the 20 younger women aged 25-34 reported more that their health was fair or poor. No women in the older age groups (35-44 and 55-65) reported their general health as excellent (Table 5).

Table 5 Participants general health

	n	%
Excellent	4	6
Very Good	20	31
Good	28	43
Fair	11	17
Poor	2	3
Total	65	100

HEALTH HISTORY & MEDICATIONS

Question 33 asked women to circle, from ten supplied responses, their history of illness. Of the 65 participants, 31 (48%) reported no history of illness. History of illnesses included: Heart Disease 9 (14%), Diabetes 8 (12%), Cancer 9 (14%), Mental Health Problem 6 (9%), Heart Failure 3 (5%), Stroke 6 (9%), Heart Attack 5 (8%), Angina 6 (9%), Hypothyroidism 3 (5%) and Respiratory 7 (11%) (Table 6). Question 34 was a yes/no question asking if women were taking any prescription medication. Over half the 65 women surveyed 39 (60%) indicated they were taking prescription

medication.   Question 35 then asked participants to list the medication (both prescription and over the counter) that they were currently taking. Medications taken included: antihypertensive medication 13 (20%), hypolipidaemic medication 6 (9%), hormone replacement therapy 7 (11%) and various other medications 32 (49%) such as antianginal medication by 1 (2%) woman and respiratory drugs by 4 (6%) women. Three (5%) were taking thyroxine and 1 (2%) was taking anticoagulants. Five (8%) were taking over the counter medication, which included vitamins, supplements and analgesics.   There were no women who reported they were currently taking any medication for diabetes.

Table 6 Medical History

	n	%
Heart Disease	9	14
Diabetes	8	12
Cancer	9	14
Mental Health	6	9
Heart Failure	3	5
Stroke	6	9
Heart Attack	5	8
Angina	6	9
Hypothyroidism	3	5
Respiratory	7	11
No Medical History	31	48

WEIGHT

Question 36-38 asked participants to self-report about their own weight. Only 32 (49%) of the 65 women surveyed considered their own weight as acceptable or healthy with 31 (48%) assessing themselves as being overweight. The remaining two (3%) participants considered themselves to be underweight (Table 7). Twenty-five (39%) women assessed their weight through clothing size and 23 (35%) through clothing fit (loose or tight). Twenty-two (34%) assessed their weight with the use of Body Mass Index scale. Five (8%) women assessed their weight by comparison to others and 17 (26%) assessed their weight by how they felt. Eleven (17%), found other ways to assess their weight and these included Weight Watchers [TM], scales and measurements. An increase in weight in the previous 12 months was reported by 22 (34%) participants, 13 (20%) reported a decrease and 29 (45%) reported no change in their weight. Data was missing from one questionnaire.

Table 7 Participants self assessment of weight

		Underweight	Weight Acceptable or healthy	Overweight	Total
Age	25-34 years	0	7	13	20
	35-44 years	0	7	3	10
	45-54 years	1	9	5	15
	55-65 years	1	9	10	20
	Total	2	32	31	65

BLOOD PRESSURE

Question 39 asked 64 participants if they had had their blood pressure checked in the last 12 months. Fifty-two (81%) reported that they had. Questions 40 and 41 asked women if they had ever been told by a doctor, nurse or other health professional that they had high blood pressure, and if they were currently taking medication for high blood pressure. Twenty-two (35%) had been told they had high blood pressure and 14 (22%) reported that they were currently taking medication for high blood pressure. Eleven (55%) of the 20 older women had the highest prevalence of hypertension. High blood pressure was reported in all age groups except women aged 35-44 years (Table 8).

Table 8 Blood Pressure

		Have you ever been told you have high blood pressure?		Total
		Yes	No	
Age	25-34 years	4	15	19
	35-44 years	0	10	10
	45-54 years	7	8	15
	55-65 years	11	9	20
	Total	22	42	64

EXERCISE

Question 42 asked women if they had participated in any physical activities or exercises such as running, callisthenics, golf, gardening or walking for exercise in the past month. Of the 64 women who answered the question, a majority of 55 women (86%) reported exercising within the past month. Women across all age groups consistently reported that they exercised in the past month (Table 9).

Table 9 Exercise

		Exercise		Total
		Yes	No	
Age	25-34 years	16	3	19
	35-44 years	9	1	10
	45-54 years	13	2	15
	55-65 years	17	3	20
	Total	55	9	64

CHOLESTEROL

Questions 43 to 45 asked women three questions about cholesterol. The first question asked if they have ever had their cholesterol checked. The second question asked how long it has been since their blood cholesterol had been checked and gave four responses ranging from within the past year to five or more years ago. The third question asked if participants had ever been told by a doctor, nurse or other health professional that their blood cholesterol was high. Sixty-three women answered question 43. Over half of the women, 41 (65%), had had their cholesterol checked and 10 (24%) of these 41 women reported that they had been told by a doctor, nurse or other health professional that they had high cholesterol. As expected, the majority of these women were in the 55-65 year age group. Twenty-four (59%) of 41 women who answered the question had had their cholesterol checked within the past year. Eight (19%) had their cholesterol checked within the last 2 years and seven (17%) within the past 5 years. The remaining two (5%) had their cholesterol checked 5 or more years ago (Table 10)

Table 10 Women reported to have been told they have high cholesterol

		Have been told have high cholesterol		Total
		Yes	No	
Age	25-34 years	2	5	7
	35-44 years	1	5	6
	45-54 years	0	11	11
	55-65 years	7	10	17
	Total	10	31	41

TOBACCO USE

Questions 46-48 asked women about tobacco use. Question 46 asked if they had smoked at least 100 cigarettes in their entire life. Question 47 asked if they smoked cigarettes every day, some days or not at all and question 48 asked if they had stopped

smoking for one day or longer because they were trying to quit in the past twelve months. Twenty nine (46%) of the 63 women reported that they had never smoked 100 cigarettes in their entire life. Thirty-four (54%) of women reported that they had smoked at least 100 cigarettes in their entire life but 19 (56%) of those women went on to report that they did not smoke at all now. Thirteen (38%) reported that they smoked every day and 2 (6%) still smoked some days (Table 11). Of the thirteen women aged 25-34 years, 8 (61.5%) reported that they smoke at least sometime, which is a higher percentage than in any other age group (50% in 35-44 year olds; 40% in 45-54 year olds and 14% of those 55-65) (Table 12). Seven (40%) reported that they had tried to quit smoking for one day or longer in the past 12 months.

Table 11 Current Smoking Status

		Never Smoked	Current Smoker	Ex Smoker	Total
Age	25-34 years	7	6	5	18
	35-44 years	6	2	2	10
	45-54 years	5	4	6	15
	55-65 years	11	3	6	20
Total		29	15	19	63

Table 12 Frequency of smoking

		How often smoke			Total
		Every day	Some Days	Not at all	
Age	25-34 years	6	2	5	13
	35-44 years	2	0	2	4
	45-54 years	4	0	6	10
	55-65 years	1	0	6	7
	Total	13	2	19	34

ALCOHOL CONSUMPTION

Questions 49-52 asked women about their alcohol consumption. A diagram showing quantities equivalent to one standard drink and a table with examples of standard drink quantities was provided at the beginning of these questions. Women were asked if they had consumed at least one drink of any alcoholic beverage in the past 30 days. They were then asked how often they drank alcohol with the responses including monthly or less, two to four times a month, two to three times a week and four or more times a week. Question 51 asked how many standard drinks they would have on a typical day when drinking. There were five responses to choose from ranging from one or two up to 10 or more standard drinks. Finally, question 52 asked how often women have six or more drinks on one occasion. There were five responses which

included never up to daily or almost daily. Forty (63%) of 64 women responded that they had drunk at least one alcoholic drink in the past 30 days. Of 44 women who responded to 'how often do you have a drink containing alcohol', 22 (50%) reported that they drank alcohol monthly or less, 15 (34%) drank alcohol two to four times a month, four (9%) drank two to three times a week and three (7%) drank four or more times a week. Fifty (78%) women reported the amount of alcohol they were drinking. Twenty seven (54%) reported that they drank one or two drinks on a typical day. The remaining 23 (46%) reported drinking three or more standard drinks on a typical day (Table 13). Of the eighteen women aged 25-34 years, 10 (55.5%) reported that they drink three or more standard drinks on a typical day of drinking, which is a higher percentage than in any other age group; (45% in 35-44 year olds; 36% in 45-54 year olds and 14% of those 55-65) (Table 14). Fifty-eight women answered the question regarding how often they would drink six or more drinks on one occasion. Thirty-two (55%) responded that they never drank six or more drinks on one occasion, 14 (24%) did less than monthly, eight (14%) monthly and four (7%) drank six or more drinks every week.

Table 13 Standard drinks drunk on a typical day

Number of Drinks	n	%
1 or 2	27	54
3 or 4	10	20
5 or 6	7	14
7 to 9	3	6
10 or more	3	6
Total	50	100

Table 14 Alcohol Consumption

		No Alcohol	Moderate Alcohol 1-2 standard drinks	Excess Alcohol 3 or more standard drinks	Total
Age	25-34 years	2	6	10	18
	35-44 years	1	5	5	11
	45-54 years	5	4	5	14
	55-65 years	6	12	3	21
Total		14	27	23	64

LIFESTYLE HABITS

Total risk factors were combined to determine how many women had two or more heart disease risk factors. The risk factors examined included being overweight, not exercising in the past month, having a history of being told by a health profession that their blood pressure and/or cholesterol was high, being a current smoker and regularly consuming more than two standard alcoholic drinks. Data from sixty four completed questionnaires were included (Table 15). Of these sixty four, 13 (20%) had no reported lifestyle risk factors and 14 (22%) had only one risk factor. The remaining 37 (58%) reported two or more heart disease lifestyle risk factors.

Table 15 Total Risk Factors

Number of Risk Factors	n	%
0	13	20
1	14	22
2	22	34
3	10	16
4	5	8
Total	64	100

Mean HDFQ scores for women with 0 through 4 risk factors are presented in Table 16. The number of risk factors ranged from 0-4, being the maximum number of risk factors self reported by participants in this study. As discussed previously, knowledge scores ranged from 52-100 as the maximum score.

Table 16 Heart disease knowledge and risk factors

TOTAL RISK FACTORS	N	Minimum	Maximum	Mean	Std. Deviation
0	13	60	96	86.15	9.60
1	14	68	100	86.57	9.23
2	22	52	92	81.27	10.20
3	10	72	96	84.40	7.41
4	5	56	92	76.80	14.53
Total	64	52	100	83.56	10.00

The number of risk factors was then collapsed into a binary variable, indicating 0-1 risk factors (low or no risk of heart disease) or 2 or more risk factors (moderate to high risk of heart disease. An independent samples t-test was then performed on knowledge to examine whether there is a difference in knowledge based on the risk factor group. Descriptive information and t-test results are presented in table 17.

There was a significant difference in knowledge between the two risk groups (t = 1.96, p = 0.05). The group means show that the lower risk group (mean = 86.37) had a higher mean knowledge score than the higher risk group (mean = 81.51). The p-value is slightly higher than the conventional threshold of .05, but the difference is substantively interesting. Also, Cohen's $d = 0.500$, indicating a moderate effect size.

Table 17 Comparison between risk factor and knowledge score

Group	N	Mean	SD	t	p	d
Low Risk (0 -1 risk factors)	27	86.37	9.23	1.96	0.05	0.50
High Risk (>1 risk factors)	37	81.51	10.17			

When examining the relative frequencies of women in the weight categories, it is clear that those in the overweight category have more often been informed that they are hypertensive than those in the normal weight category (Figure 3). Of the thirty two women who assessed their weight as acceptable or healthy, 7 (22%) also reported to have high blood pressure. Of the thirty women who reported to be overweight, 15 (50%) also reported to have high blood pressure. While younger women reported a higher percentage of being overweight, this same age group was more likely not to have had their blood pressure checked in the last twelve months (Table 18).
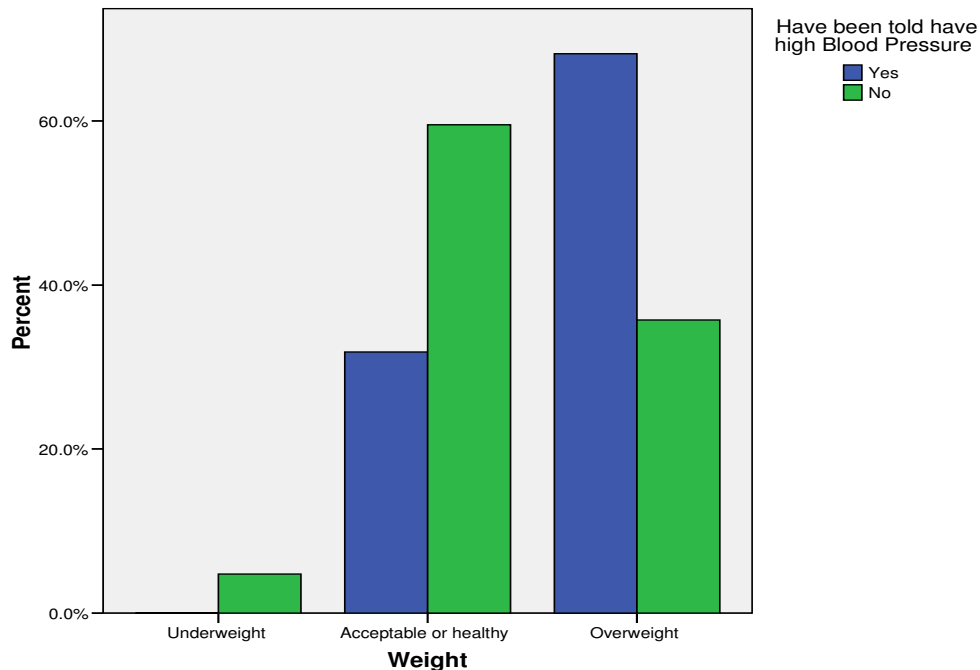
Figure 3 Weight assessment and high blood pressure

Table 18 Blood Pressure checked

		Blood Pressure checked		Total
		Yes	No	
Age	25-34 years	14	5	19
	35-44 years	7	3	10
	45-54 years	12	3	15
	55-65 years	19	1	20
Total		52	12	64

SUMMARY

This study explored the perceptions, knowledge and awareness of coronary heart disease in rural women. A questionnaire containing 52 questions was distributed to 93 rural women attending a women's health clinic over a 7 week period. A total of 65 (70%) questionnaires provided data for analysis. The results are presented in this chapter, in three sections. Section one presents the results of women's awareness of heart disease as the greatest health problem and common cause of death in women. Findings indicate that rural women do not recognise heart disease as the leading cause of death in women and perceive breast cancer as a greater health problem. Section two presents results of women's knowledge of heart disease with the application of questions from the *Heart Disease Fact Questionnaire*.[131, 133] Overall, women's knowledge of heart disease is quite good although women's knowledge of cholesterol and diabetes did not rate well. Women also did not recognise that age and menopause increases their risk of heart disease, particularly women in the 55-65 year age group. Section three reported on women's health and health promoting behaviours. A little less than half of the participants reported that they were overweight. Women in all the age groups reported that they had been told by a health professional they had high blood pressure and a little over half reported that they had smoked at least 100 cigarettes in their life. Younger women were smoking more frequently than older women. The majority of women reported that they had exercised in the past month. Only half the women reported having had their cholesterol checked and of those, women in the 55-65 year age group were more likely to have been told they had high cholesterol. Women were also reporting large amounts of alcohol consumption in one session. These results suggest that while women have a good knowledge of heart disease, they are not aware of their risk of heart disease.

CHAPTER 5 - DISCUSSION

INTRODUCTION

This chapter interprets the findings of the study within the context of the available literature about women and heart disease. The methods used to conduct the study have been taken into account. The discussion begins with a brief overview of how the study was conducted and the purpose of the study. This has been followed by a summary and evaluation of the main results. These are presented within three headings; awareness of heart disease, heart disease knowledge and behaviour change. A discussion of the significance of the findings that included the implications in and on practice for nurses will follow with respect to education for women about coronary heart disease. Limitations of the study are discussed along with recommendations for further research.

PURPOSE OF THE STUDY

The study was conducted to evaluate the current awareness, perception and knowledge of heart disease among rural women aged twenty five to sixty five years. A self reported questionnaire was distributed by nursing staff to women aged 25-65 years attending a well women's clinic in a rural health centre in South Australia over seven weeks of the study period. Participants completed the questionnaire in their own time and place and then returned the completed questionnaire via Australia post to the researcher using a stamped self-addressed envelope provided. The purpose of this study was to

a. Assess rural women's current level of awareness of heart disease as the leading cause of death in Australian women.

b. Describe rural women's current knowledge and perception of cardiovascular disease as well as actual risk of cardiovascular disease and

c. Evaluate whether heightened awareness and knowledge is associated with increased action to lower risk of heart disease.

SUMMARY OF FINDINGS

The findings of this study indicate that rural women are unaware of their risk of heart disease as the leading cause of death. The findings of this study also suggest that the majority of women do not perceive heart disease as a threat, but believe breast cancer poses a greater threat to their health. The results of this study also found that women's overall knowledge of heart disease was good. Nevertheless, there were two areas of knowledge that were suboptimal. These were women's knowledge of age and menopause as risks of heart disease, as well as cholesterol. This knowledge though did not relate to positive action to minimise their own risks, with over half of women participants having two or more lifestyle risk factors for heart disease.

AWARENESS OF HEART DISEASE

The results of women's lack of awareness of heart disease and their fear of breast cancer as a greater threat are consistent with other studies. [90, 103, 104] National survey work for the Pfizer Australia Health Report and Australian Heart Foundation uncovered the staggering statistic that ninety seven percent of people were unaware that heart disease is the leading cause of death for women.[144] While American Heart Association studies [6, 62, 90] show that women are becoming more aware of the problem of heart disease, this is not evident in the current study of Australian women.

These perceptions differ from the actual statistics for the leading causes of death for women in Australia in 2005.[145] According to the Australian Bureau of Statistics, ischemic heart disease is the leading cause of death in Australian women. In 2005 109,000 women died of heart disease and twenty seven thousand women died of breast cancer. Ischemic heart disease is the number one cause of death of Australian women, followed by cerebral vascular diseases, then dementia and Alzheimer's disease. Breast cancer is rated as the fourth cause of death in Australian women. More than 12,000 Australian women die from heart disease each year, which is 4.5 times higher than deaths from breast cancer.[144]

A possible reason that women underestimate the importance of coronary heart disease risk may be that this issue is not often discussed. An American Heart Association survey [39] found that only 38% of medical officers discussed heart disease with their

female patients and that only 20% of the female patients surveyed reported that a healthcare professional gave them information on heart disease in the past twelve months. A possible explanation for the lack of communication between health providers and their patients may be that there is a general focus on traditional women's healthcare issues, such as breast disease and gynaecologic problems.[146] Other health care providers fail to discuss heart disease or its risk factors with their female patients because they think of heart disease primarily a man's disease, or as less serious in women. This thinking leads to less aggressive treatment or even no treatment at all.[4] Considering the impact of coronary heart disease on women, this lack of communication and low level of awareness of the disease in women are problematic.

The increased awareness of breast cancer may be related to the uniquely female aspect of the disease and to the excess of information on breast cancer that is targeted to women.[104] Breast cancer awareness is everywhere, particularly with recent high profile women who have been diagnosed with breast cancer. Televised dramas and documentaries do not help with raising awareness, as they tend to misrepresent heart disease as a disease afflicting men. Women's magazines, by contrast, have many columns devoted to losing weight, exercise and reducing fat intake. These concepts are never presented in terms of preventing heart disease, but packaged around aesthetic looks and slimness.[2] From this perspective, heart disease in women is not driving the health agenda. In addition, health pages in women's magazines tend to discuss various forms of cancer and in particular breast cancer, and offer tips on how to minimise the risks. Since breast cancer affects many young women and invades the organs connected with femininity and reproduction, it is the topic that is emotionally loaded, which presumably attracts a wide readership.[2] Although the awareness of breast cancer has led to earlier detection and increased survival, the heightened concern surrounding breast cancer may overshadow other important healthcare issues.[146] Breast cancer has many renowned women who have come out and spoken about their personal story and recovery story.

HEART DISEASE KNOWLEDGE
The results of this study show that while women may not acknowledge heart disease as the greatest health problem or the leading cause of death, they generally had a high

level of knowledge of heart disease. There were a few deficits in women's knowledge of heart disease and these related to menopause, age and cholesterol. Less than half the women who participated in this study recognised that women are at a higher risk of heart disease after menopause, or that their risk of heart disease increases with age. This was also found in an American study of women and heart disease.[3] In general, symptoms of coronary heart disease are first observed approximately ten years later in women than in men.[146] The delayed onset is often credited to the protective effect of female sex hormones.[147] This theory is consistent with the findings of increased morbidity and mortality from heart disease after menopause.[146]

While women in this study were able to recognise that high cholesterol is a risk factor for developing heart disease, and were able to correctly find that 'good' cholesterol (HDL) is not a risk for heart disease and 'bad' (LDL) cholesterol is a risk for heart disease, they were not able to recognise that a person with diabetes tends to have low HDL cholesterol. This may be because while participants understood that one type should be high and the other low, their greater familiarity with the generalized term 'cholesterol' and their recognition that high (total) cholesterol levels are unhealthy result in confusion about cholesterol being both good and bad, with goals for high and low numbers.[148] This may also indicate that while women may know their total cholesterol number, many may not be aware of their HDL and LDL levels.

BEHAVIOUR CHANGE

The results of this study found no relationship between knowledge of cardiovascular disease and risk-reducing behaviours. Greater knowledge of heart disease was not an indication that women were engaging in better lifestyle behaviour. These results are similar to other studies. [3] The data examined were based on self-reported risk factor status and were dependent on the individuals' awareness of their risk factor status. Trends in awareness of risk factor status may be different from trends in actual risk factor status. Eighty one percent of women surveyed reported having had their blood pressure checked in the past twelve months. Thirty five percent of women were told they had high blood pressure, only half of these women were taking medication for hypertension. Similar results were shown for women with high cholesterol levels. There has been a significant decline in the proportion of people with high blood pressure (and/or receiving treatment) since the 1980s, yet there is thought to have

been little change in blood cholesterol levels in the Australian population in the same period.[149]

Cigarette smoking is the single most preventable cause of morbidity and mortality in Australia.[144] The results of this study found that 24% of women reported they were currently smoking, reflecting National Health results.   The Australian Bureau of Statistics reports that the proportion of adults who are current smokers has changed marginally over time dropping from 24% in 2001 to 23% in 2004-05 (age adjusted).[150] Smoking cessation markedly reduces overall cardiovascular risk. The risk of myocardial infarction is two to six times higher in people who smoke than in non smokers.[60]

Thirty six percent of women who participated in this study were found to be drinking above the recommended levels for prevention of heart disease. Excessive alcohol consumption, including binge and heavy drinking has been linked to injuries and deaths from accidents. Long-term heavy drinking increases the risk for high blood pressure, heart arrhythmias and stroke.[137]   The National Heart Foundation recommends that alcohol intake should be limited to one standard drink per day for women.[60]

Obesity is an important determinant of coronary heart disease. Overweight and obesity are highly prevalent in rural areas of Australia and post significant risks to health. Overweight and obesity increases the risks for hypertension, heart disease and diabetes.[137]   Results from this study found that women who reported being overweight are more likely to also have been told that they have high blood pressure. This is consistent with risk estimates from population studies suggest that 75% of hypertension can be directly attributed to obesity.[84] In the last 20 years there has also been a significant increase in the proportions of overweight and obese Australians.[82]

Interestingly, there were no women who reported having diabetes or were taking medication for diabetes. Australian studies have shown that self-reported diabetes has more than doubled from 1.3% in 1989-90 to 2.9% in 2001.[151] These figures may be underestimated though, as it has been found that when undiagnosed cases are

included, it is estimated that nearly one million Australians aged twenty five and over (7.6% of the population) have diabetes.[82] Diabetes is the sixth leading cause of death in Australia, and contributes to significant disability. Diabetes involves high rates of health service utilisation, with morbidity and mortality increasing markedly with age. People with diabetes are two to four times more likely to develop cardiovascular disease.[152] Diabetes shares risk factors with, and is itself a risk factor for coronary heart disease, stroke and peripheral vascular disease. People with diabetes are more likely to have a clustering of risk factors such as high blood cholesterol, overweight and high blood pressure, associated with the metabolic syndrome.

Over half of women participants in this study reported having two or more lifestyle risk factors for heart disease. This was despite having a good knowledge of heart disease. This is consistent with other studies that found that women's perception of their personal susceptibility to heart disease was not related to their knowledge about heart disease risk.[110, 137] Consequently, this study demonstrates that women may know about heart disease risk factors, nevertheless they may be unaware of their susceptibility to heart disease in relation to the risk factors. Without an awareness of personal susceptibility, women may be less likely to take action to reduce the risk of heart disease.

Greater awareness and knowledge is associated with increased action to lower risk of heart disease. Prevention of coronary heart disease also contributes to decreased morbidity and mortality from other chronic illnesses such as diabetes, cancer, depression, chronic renal disease, respiratory disorders and musculoskeletal disorders. In fact, prevention of heart disease involves a healthy lifestyle that includes diet modifications, exercise, weight control, limiting alcohol and smoking cessation. This information, when introduced at a young age, will result in increased quality of life and less chronic illness for women. Therapies and behaviour modification that delay disease onset will markedly reduce overall disease prevalence, whereas therapies to treat existing disease will alter the proportion of cases that are mild as opposed to moderate/severe. The public health impact of such changes would likely involve both the amount and type of health services needed.[153]

SIGNIFICANCE OF FINDINGS

RESPONSE RATE

The present study achieved a response rate of 73% (68 out of 93 questionnaire returned). The achieved response rate was more than the researcher's expectations of 50%, which was estimated from literature data on survey studies.[89] The response rate varies and depends on many factors, such as subjects demographic profile, technique of conducting the survey and clarity of the questionnaire items.[128] There is not a standard response rate to survey studies and therefore the response rate should be evaluated within the context of each study individually and compared with similar studies.

Other published studies investigating women's perception, knowledge and awareness of coronary heart disease have not included postal surveys, but telephone surveys, making it difficult to compare response rates.[6, 90, 104] The target population of the current study was relatively small and therefore relying solely on the retaining percentage to evaluate the success in recruiting subjects might be misleading.

IMPLICATIONS FOR PRACTICE

Coronary heart disease in women will continue to be a public health priority as significant numbers of aging women are at increased risk for morbidity and mortality related to heart disease. Healthcare systems need to begin to shift paradigms to emphasize healthy lifestyles for young women. This approach will help prevent development of risk factors and minimize the need to manage them at a later time.[62] Even though most heart disease is manifested in adults, the disease process can begin at a young age.[7] Because of the magnitude of the problem of heart disease in women and the evidence that risk can be decreased by a healthy lifestyle, there is an obligation to action before women show symptoms of myocardial infarction. Educational programs targeting younger women emphasizing the role of diet, exercise, smoking cessation and regular blood cholesterol measurements should be stressed in preventing heart disease.[37] Programs that focus on heart disease risk reduction may have a profound effect on disease progression because pathogenesis begins early in life.[8] Studies have linked fatty streaks to atherosclerotic disease suggesting that awareness of heart disease risk at a young age may have an effect on the rate of disease development in the subsequent 20-40 years.[154, 155] It is

therefore beneficial for the entire population, including children and adolescents, to have an awareness of the risk factors associated with heart disease and the education necessary to modify risk factors as needed on an individual basis. Future health education for adolescents and young adults should be focused on prevention of heart disease, because prevention of heart disease is important to this population.[7]

Cardiovascular disease is primarily a lifestyle disease, and is amenable to changes. Research shows that coronary heart disease can be slowed significantly or progression halted when preventive programs have been instituted at the beginning stages of the disease.[140] Effective primary prevention of coronary heart disease requires early detection of risk factors, communication of individual risk to women and benefits of early intervention. Assessment and communication of risk is necessary as it can assist women to have insight into the impact and by developing a more realistic perceived risk of coronary heart disease that, in turn, may motivate them to initiate and maintain healthy behaviours.[95] Health professionals have advocated primary prevention of heart disease for many years, however it seems that women in general are not heeding the message.[140] Nurses can play a major role in educating both the public and other healthcare providers about the very real danger of heart disease in women. Heart disease is not a man's disease. It is an equal-opportunity disease. The media, through the Heart Foundation has launched a huge campaign to educate the public about this potentially lethal disease, however, the myth still exists.[37]

The findings of this study indicate the need for heart disease education programs for all women. New strategies for educating women about coronary heart disease should be explored by nurses. Nurses need to be aware that women tend to recognize smoking, obesity and inactivity as risk factors nevertheless are less aware of factors such as hypertension, diabetes, age and hyperlipidemia. Many women have never had their cholesterol tested and women need to be taught the importance of knowing their cholesterol levels and how to improve their cholesterol profile. Nurses can lead multidisciplinary team members in delivering care that decreases risks and increases knowledge for their patients. Nurses interested in cardiovascular disease in women could organize and offer educational sessions in local schools, churches and at sites where women work. Collaborating with the National Heart Foundation and Country Health in educating women may be appropriate. By increasing women's knowledge,

their actual risk may change and thus improve their chance to live free of cardiovascular disease or have it later in life or to a lesser extent.[156]

There are many situations open to nurses for providing either planned or opportunistic verbal information, which could be supplemented by written materials that specifically focus on the needs and priorities of women at risk of heart disease.[2] Nurses need to look for those risk factors that may be more specific to women, such as diabetes, depression, post menopause, and thyroid dysfunction. The importance of testing for diabetes, thyroid disease, depression and lipid levels needs to be stressed.[37] In a survey of one hundred and twenty women between the ages of 35 and 60 years with no history of heart disease, it was found that nurse practitioners were ideally suited to decrease the mortality and morbidity associated with heart disease through education strategies and attention to individual barriers women face when attempting to incorporate coronary heart disease risk factor modification into their lives.[157] Nurses play an important role, whether in the hospital or community setting as they have the closest contact with women, whether as female patients, daughters, mothers, carers or partners. There are many situations open to nurses for providing either planned or opportunistic verbal information, which could be supplemented by written materials that specifically focus on the needs and priorities of women with coronary heart disease.[2]

STUDY LIMITATIONS

Participation in this study was limited to women who were able to read English. Generalisation of the result to non-English speaking groups, including Aboriginal women are limited, as they did not participate in the study. Participants were not required to disclose their ethnicity so generalisations of the results to women of race other then Caucasian cannot be made. Data related to socioeconomic status was not collected for individual participants so it is unknown if socio-economic status affected women's perception, knowledge and awareness of heart disease. Due to the specific characteristics of this particular sample (e.g. convenience sampling was used and the sample was limited in diversity regarding race), results should not be generalized to the greater population of rural women.[134] However, the findings of this study lead to implications for nurses, particularly for those practicing in rural communities.

In efforts to maintain participants' anonymity the researcher did not have control over the distribution of the questionnaires. Hospital employed nursing/midwifery staff were responsible for the distribution of the questionnaires to women and a clear criteria was provided. These staff members had the opportunity to act in a gate keeper role and had the potential to restrict who received the questionnaires. There is no evidence however, to show that this occurred.

Data examining health history was unable to be included in the discussion of this study as it was thought to be inaccurate. Many of the completed questionnaires had numerous responses to the question about health history and it is thought by the researcher that many of the women interpreted this question as family history rather than personal history.

Other risk factors have not been addressed in this study. Depression, menopausal status and thyroid abnormalities have been linked to coronary heart disease in women.[37] Information about the participants' menopausal status and knowledge of hormone replacement therapy as a preventive strategy would have been useful.

RECOMMENDATIONS FOR FURTHER INVESTIGATION

More research is needed to develop means to improve women's perception of their risk for heart disease and to encourage them to act on their enhanced perception and thereby reduce overall heart disease morbidity and mortality. Women's perception and awareness of risk requires quantification by empirical studies that should be done on an ongoing basis to evaluate changes in heart disease knowledge in women over time. Future studies should focus on exploring in detail the specific areas of knowledge deficits so that education can be provided in a more focused manner. Further study also needs to be done on the effects of risk modification by women.

Few clinical or public health interventions for primary prevention have targeted women, despite the high prevalence of risk factors and morbidity and mortality from cardiovascular disease in women.[158] For the most part, the effects of cardiovascular health interventions have been understudied in women. Much work needs to be done to improve cardiovascular health in women and to learn the best ways of helping women to adopt and sustain healthy lifestyle behaviours.

CONCLUSION

Coronary heart disease in women will continue to be a public health priority as increasing numbers of aging women are at increased risk for heart disease morbidity and mortality. Given the frequent occurrence of multiple risk factors in women, a multifactorial approach to primary prevention and risk factor reduction should be encouraged to help reduce the prevalence and burden of heart disease among women in Australia.

Few women appreciate that cardiovascular disease is their major health problem. This gap between fact and perception highlights the need to increase women's awareness about their vulnerability to coronary heart disease. Although deaths from heart disease is 4.5 times higher than deaths from breast cancer, women perceive breast cancer as their major health problem.[144] Changing the misperception of women about their health problems includes increasing their knowledge that favourable changes in lifestyle can reduce cardiovascular risk factors and prevent cardiovascular disease and coronary heart disease.

Cardiovascular disease is a serious epidemic in the female population. Almost two thirds of women who die suddenly of coronary heart disease had no previous symptoms of their illness. The fact that coronary risk factors predict sudden cardiac death provides a further rationale for coronary risk reduction for women.[27] It is essential for health workers to increase their awareness of sex-based differences in risk factors, lipid profiles and treatment response to effectively refocus cardiovascular care for women. Cardiovascular risk factors should be assessed in women starting much earlier than menopause and should then be treated as aggressively in women as men.[41] Any woman can benefit from increased awareness of the risks, and the younger women who adopt healthy lifestyle behaviours now may avoid developing heart disease later in life.

The results of this study revealed that many women are at risk of developing heart disease. This research recommends aggressive risk factor education among women associated with risk factor modification programs. The use of a risk factor assessment instruments to provide individual scores for each women's risk for cardiac disease can facilitate development of individual plans for risk factor modification. Women at

high risk for heart disease would benefit for a collaborative, multidisciplinary approach.

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APPENDIX 1

Dear Madam,

I am a candidate in the Master of Nursing Science at the Discipline of Nursing in the School of Population Health at The University of Adelaide. I am currently investigating the understanding women aged between 25 and 65 years have of heart disease.

I would appreciate it if you could complete the enclosed questionnaire and deposit it in the box provided in the waiting area or post it to me in the reply paid envelope provided. It will take you between 15-20 minutes to complete the questionnaire. Your participation is voluntary and if you do not wish to complete the questionnaire, your future medical treatment will not be affected in any way.

It is hoped that this study will provide doctors and nurses with a better understanding of women's knowledge of Coronary Heart Disease. The results of this study may be published, but all participants will remain anonymous.

If you have any queries, please contact Rosanne Crouch, Ward A, Port Pirie Regional Health Service 86364500 extension 84526. Alternatively, you may wish to contact my supervisor, Dr Anne Wilson, University of Adelaide, (08) 8303 3593. Information on the complaints procedure is also enclosed in case you wish to discuss any issues about the way in which this study is conducted with an independent person.

I wish to thank you in advance for your assistance.

Rosanne Crouch

APPENDIX 2

THE UNIVERSITY OF ADELAIDE
HUMAN RESEARCH ETHICS COMMITTEE

CONTACTS FOR INFORMATION ON PROJECT AND INDEPENDENT COMPLAINTS PROCEDURE

The Human Research Ethics Committee is obliged to monitor approved research projects. In conjunction with other forms of monitoring it is necessary to provide an independent and confidential reporting mechanism to assure quality assurance of the institutional ethics committee system. This is done by providing research participants with an additional avenue for raising concerns regarding the conduct of any research in which they are involved.

The following study has been reviewed and approved by the University of Adelaide Human Research Ethics Committee:

Project title:

Perception, Knowledge & Awareness of Coronary Heart Disease among rural

Australian women 25 to 65 years of age – An Exploratory Descriptive Study

1. If you have questions or problems associated with the practical aspects of your participation in the project, or wish to raise a concern or complaint about the project, then you should consult the project co-ordinator:

   Name: Dr Anne Wilson
            Senior Lecturer
             Discipline of Nursing
             University of Adelaide
   Telephone: (08) 8303 3593
   email: anne.wilson@adelaide.edu.au

2. If you wish to discuss with an independent person matters related to
   • making a complaint, or
   • raising concerns on the conduct of the project, or
   • the University policy on research involving human participants, or
   • your rights as a participant

Contact the Human Research Ethics Committee's Secretary on phone (08) 8303 6028

APPENDIX 3 QUESTIONNAIRE

This questionnaire contains three sections relating to women's health issues, your personal health and heart disease. It should take between 10-15 minutes to complete.

Section 1

Please provide your response to the following questions by circling one answer only.

Women's Health Issues

1. Which of the following do you consider the greatest health problem for women?
    a. Cancer (generally)
    b. Heart Disease/heart attack
    c. Diabetes
    d. Breast Cancer
    e. Cervical Cancer

2. Coronary heart disease is the most common cause of death in women in Australia?
    a. True
    b. False

3. In Australia, breast cancer claims more lives than heart disease?
    a. True
    b. False

Section 2

Please provide your response to the following questions by circling one answer only.

Heart Disease

4. Heart disease develops gradually over many years and can easily go undetected.
    a. True
    b. False

5. If you have a family history of heart disease, you are at risk for developing heart disease.
    a. True
    b. False

6. The older a person is, the greater their risk of having heart disease.
    a. True
    b. False

7. Smoking is a risk factor for heart disease.

    a. True

    b. False

8. A person who stops smoking will lower their risk of developing heart disease.

    a. True

    b. False

9. High blood pressure is a risk factor for heart disease.

    a. True

    b. False

10. Keeping blood pressure under control will reduce a person's risk for developing heart disease.

    a. True

    b. False

11. High cholesterol is a risk factor for developing heart disease.

    a. True

    b. False

12. Eating fatty foods does not affect blood cholesterol levels.

    a. True

    b. False

13. If your 'good' cholesterol (HDL) is high you are at risk for heart disease.

    a. True

    b. False

14. If your 'bad' cholesterol (LDL) is high you are at risk for heart disease.

    a. True

    b. False

15. Being overweight increases a person's risk for heart disease.

    a. True

    b. False

16. Regular physical activity will lower a person's chance of getting heart disease.
- a. True
- b. False

17. Only exercising at a gym or in an exercise class will lower a person's chance of developing heart disease.
- a. True
- b. False

18. Walking and gardening are considered exercise that will help lower a person's chance of developing heart disease.
- a. True
- b. False

19. Diabetes is a risk factor for developing heart disease.
- a. True
- b. False

20. High blood sugar puts a strain on the heart.
- a. True
- b. False

21. If your blood sugar is high over several months it can cause your cholesterol level to go up and increase your risk of heart disease.
- a. True
- b. False

22. A person who has diabetes can reduce their risk of developing heart disease if they keep their blood sugar levels under control.
- a. True
- b. False

23. People with diabetes rarely have high cholesterol.
- a. True
- b. False

24. If a person has diabetes, keeping their cholesterol under control will help lower their chance of developing heart disease.

    a. True

    b. False

25. People with diabetes tend to have low HDL (good) cholesterol.

    a. True

    b. False

26. A person who has diabetes can reduce their risk of developing heart disease if they keep their blood pressure under control.

    a. True

    b. False

27. A person who has diabetes can reduce their risk of developing heart disease if they keep their weight under control.

    a. True

    b. False

28. Men with diabetes have a higher risk of heart disease than women with diabetes?

    a. True

    b. False

29. Women are a higher risk of heart disease after menopause?

    a. True

    b. False

30. A person always knows when they have heart disease.

    a. True

    b. False

Section 3

Personal Health Status

31. Which of the following groups does your age fit?

    a. 25-34 years

    b. 35-44 years

    c. 45-54 years

    d. 55-65 years

32. Would you say that your general health is:

    a. Excellent

    b. Very Good

    c. Good

    d. Fair

    e. Poor

33. Do you have a history of the following illnesses *(Please circle all the responses that apply to you).*

a. Heart Disease	f. Stroke
b. Diabetes	g. Heart Attack
c. Cancer	h. Angina
d. Mental Health problem	i. Hypothyroidism
e. Heart Failure	j. Respiratory illness

34. Are you taking any prescription medication?

    a. Yes

    b. No

35. Please list the medication (both prescription and over the counter) that you take

Name   Dose   Frequency

1._____

2._____

3._____

4._____

5._____

6._____

7._____

Please provide your response to the following questions 36-38 by circling one answer only.

Weight

36. How would you assess your own weight?

    a. underweight

    b. acceptable or healthy

    c. overweight

37. What means do you use to assess your weight?

     a. Comparison to others

     b. Clothing size

     c. Clothing fit (loose or tight)

     d. Body mass index scales

     e. How you feel

     f. Opinion of others

     g. Other _____*(Please State)*

38. Has your weight changed in the last 12 months?

     a. increased

     b. decreased

     c. no change

Blood Pressure

39. Have you had your blood pressure checked in the last 12 months?

     a. yes

     b. no

40. Have you EVER been told by a doctor, nurse or other health professional that you have high blood pressure?

     a. yes

     b. no

41. Are you currently taking medication for your high blood pressure?

     a. yes

     b. no

Exercise

42. During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, callisthenics, golf, gardening, or walking for exercise?

     a. Yes

     b. No

Cholesterol

Blood cholesterol is a fatty substance found in the blood.

43. Have you EVER had your cholesterol checked?

    a. Yes [go to question 44]

    b. No [Go to question 46]

44. How long has it been since you last had your blood cholesterol checked?

    a. Within the past year (anytime less than 12 months ago)

    b. Within the past 2 years (1 year but less than 2 years)

    c. Within the past 5 years (2 years but less than 5 years ago)

    d. 5 or more years ago

45. Have you EVER been told by a doctor, nurse or other health professional that your blood cholesterol is high?

    a. Yes

    b. No

Tobacco Use

46. Have you smoked at least 100 cigarettes in your entire life?

Note: 5 packs = 100 cigarettes

    a. Yes [Go to question 47]

    b. No [Go to question 49]

47. Do you now smoke cigarettes every day, some days, or not at all?

    a. Every day

    b. Some days

    c. Not at all [Go to Question 49]

48. During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?

    a. Yes

    b. No

Alcohol Consumption

In Australia, one standard drink is equivalent to 10g alcohol. Each of the drinks pictured below is one standard drink. Before answering the next questions, please refer to the diagram below. It shows examples of a standard drink.

NOTE:
This figure is included on page 86
of the print copy of the thesis held in
the University of Adelaide Library.

www.dassa.sa.gov.au

OTHER EXAMPLES OF STANDARD DRINK QUANTITIES:

Wine	1 bottle(750ml) = **7 standard drinks**
	1 cask (4 litres = **38 standard drinks**
Full Strength Beer	1 can or stubby of beer = **1.5 standard drinks**
	1 bottle of beer (750ml) = **3 standard drinks**
	1 six –pack o0b beer = **9 standard drinks**
Light Beer	1 six-pack of *light* beer = **5 standard drinks**
	1 case or slab of *light* beer = **20 standard drinks**
Other drinks	1 stubby of cider (375ml) = **1.5 standard drinks**
	1 bottle of spirits (750ml) = **24 standard drinks**

49. During the past 30 days, have you had a least one drink of any alcoholic beverage such as beer, wine, a malt beverage or liquor?

    a. Yes [Go to question 50]

    b. No [Go to question 51]

50. How often do you have a drink containing alcohol?

    a. Monthly or less

    b. 2 to 4 times a month

    c. 2 to 3 times a week

    d. 4 or more times a week

51. How many standard drinks do you have on a typical day when you are drinking?

      a.   1 or 2

      b.   3 or 4

      c.   5 or 6

      d.   7 to 9

      e.   10 or more

52. How often do you have 6 or more drinks on one occasion?

      a.   Never

      b.   Less than monthly

      c.   Monthly

      d.   Weekly

      e.   Daily or almost daily

Thank you for completing this survey.

Please return the questionnaire in the envelope provided and place in the box in the Well Women's Clinic.

Alternatively, post to:

      Rosanne Crouch

      Ward A

      Port Pirie Regional Health Service

      PO Box 546

      PORT PIRIE 5540