

# KNOWLEDGE AND PERCEPTION OF CARDIOVASCULAR DISEASE RISKS OF FEMALE UNIVERSITY STUDENTS

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## ABSTRACT

### Introduction:

Cardiovascular disease (CVD), traditionally thought of as a "man's disease", is the leading cause of death and disability amongst women world-wide. Research demonstrates a lack of knowledge and perceived susceptibility amongst women, especially in the younger age group.

### Aim:

To evaluate knowledge and perception of CVD risks of female university students.

### Methods:

Four hundred and thirty eight students completed a structured, self-administered questionnaire including items regarding knowledge, risk perception and risky behaviour regarding CVD.

### Results:

Overall, 56.8 % of the participants were knowledgeable ( $\geq 70\%$  correct answers) of CVD risks, with a mere 6.6% indicating heart disease as the greatest health risk for women. The White population (40.2%) was identified as the race most susceptible to CVD. A significant relationship between risk perception and being informed of the risk of developing CVD ( $p=.000$ ) and having a family history of CVD ( $p=.000$ ) was found.

### Conclusion:

It is vital to our nation's health that young female individuals are educated regarding the identification and modification of risk factors for CVD. As CVD risk factors may be managed through lifestyle modification, gender- and ethnic-specific lifestyle modification programmes should be directed at altering personal behaviours.

### Keywords:

cardiovascular disease, knowledge, perceived susceptibility, risky behaviour, female students

## Introduction

Cardiovascular disease is the leading cause of death and disability in women worldwide (Blauwet & Redberg, 2007; Pilote et al., 2007, Long, Waldrep, Hernandez & Strickland, 2005). Traditionally, cardiovascular disease (CVD) has been thought of as a "man's disease", however according to the American Heart Association (AHA) (2003), more than 40% of all deaths in American women are caused by CVD, especially coronary heart disease and stroke. In the past few decades Africa has witnessed increasing urbanisation and changing lifestyles which have raised the incidence of non-communicable diseases, especially CVD amongst both males and females (Leeder, Raymond & Greenberg, 2004). Leeder et al. (2004) furthermore stated that in developing countries, including South Africa, CVD will affect the poor as well as people at a younger age disproportionately, resulting in higher death rates.

Various risk factors exist for CVD with some being gender specific. Although women tend to develop CVD later in life than men (AHA, 2003), a woman's risk of heart disease after menopause is the same as a man's and its effects are greater in women due to specific risk factors that are unique to women, including the use of oral contraceptives, menopause and hormone replacement therapy (Anderson & Kessenich, 2001). Research has suggested that women experience chest pain differently to men. Women tend to dismiss chest pain as insignificant or caused by indigestion and delay treatment, if they seek treatment at all (Canto et al., 2007; Birchfield, 2003; Summers, Cooper, Woodward & Finerty, 2001). Studies have also found that women are more likely than men to be told that their symptoms are due to psychological or stress-related problems (Long et al., 2005; Anderson & Kessenich, 2001).

Ethnic differences also exist with regard to CVD. Birchfield (2003) reported that Black women are more likely to develop CVD, as they are more likely than White women to be hypertensive, diabetic and obese. Furthermore, Cheek and Cesan (2003) found the death rate due to CVD for Black women to be 70% higher than for White women. In South Africa, the highest death rate for CVD is found in the Indian population, followed by the Coloured population, while the Black and White population has the lowest similar rates. However, considerable pattern differences for CVD are reported between the Black and White populations. The White population mainly reflects a pattern of death caused by heart attacks, while the Black population reflects that of death caused by stroke, diseases of the heart muscle and high blood pressure (Norman, Bradshaw, Schneider, Pieterse and Groenewald, 2006).

Knowledge of CVD risks has been found to influence CVD awareness. Meisler (2001) stated that women's lack of knowledge with regard to CVD, may contribute to a higher risk of CVD due to the fact that they might ignore early signs of heart disease. Historically, women's health issues have focused on menopause and breast cancer, which may have led women to believe that CVD is not a significant problem for them (Bedinghaus, Leshan & Dieher, 2001). Previous surveys have indicated that women are oblivious to the symptoms related to heart disease as well as related risk factors involved with CVD (Bedinghaus et al., 2005; Meisler, 2001). Approximately 8% of women reported heart disease and stroke as the largest of all health related problems in contrast to 61% of women that noted cancer to be the greater risk to health (Mosca et al., 2000). Although breast cancer has been identified as the most common cancer in South African females (16.6%) (Vorobiof, Sitas &

Vorobiof, 2001), cardiovascular disease is still claiming more South African women (6%) than cancer of the breast (2.7%) (Bradshaw et al., 2006).

Women of colour and low socio-economic status (SES) seem to be more affected by CVD. Several studies in the United States (US) reported that women of all ethnicity and age groups have inadequate knowledge of CVD risk factors in spite of well-established behavioural and medical routines to lower their risks (Mosca, Ferris, Fabunmi & Roberston, 2004; Birchfield, 2003 and Cheek and Ceesan, 2003). Furthermore, research found that the younger population has some knowledge of behavioral strategies to prevent heart disease, but lack the knowledge to carry out specific prevention methods (Green et al., 2003; Vale, 2000).

It is imperative that young individuals are educated regarding the identification and modification of the risk factors of CVD. The limited research on CVD risk factors in the South African university-aged population contributes to the lack of knowledge and awareness of CVD risks. University is the final bridge between education and the working world into which adolescents become independent and self-sufficient, therefore this is an ideal time for instilling at-risk behavioural changes. Thus, the aim of this study was to determine knowledge and perception of cardiovascular disease risks of female students at a university in the Western Cape, South Africa.

## Methods

The study employed a cross-sectional, quantitative design. The population for this study included all current female students at a university in the Western Cape, South Africa. At the beginning of 2008, 15 479 students were enrolled at the

university. Of the total number of students, approximately 60% (9 251) were female. Convenient sampling was used for this research. The study sample was calculated using the Yamane formula for sampling  $n = \frac{N}{1 + N(e)^2}$  where n stands for sample, N for study population and e is a constant equal to 0.05 (Israel, 1992). According to this formula, a minimum of 390 students had to be selected in order to be able to generalize the results to female students at the participating university.

Data were collected by means of a structured, self-administered questionnaire consisting of three sections. Questions from the validated *Check your Healthy Heart I.Q Survey* used by Long et al. (2005) in their study of CVD risks in women, as well as the validated instrument used by McMahan, Cathorall and Romero (2007) in their study of cardiovascular disease risk perception and knowledge were included in the questionnaire. The *Check your Healthy Heart I.Q Survey* instrument was developed and published by the National Heart, Lung and Blood Institute of the National Institutes of Health (2004). This survey is an educational health risk assessment tool that was utilized to evaluate knowledge of CVD among women. The instrument used by McMahan et al. (2007) evaluated the students' perceived susceptibility to CVD risk. The adapted questionnaire was piloted on fifteen (15) female students to assess face validity and applicability of all the items for this population as well as the time it took to be completed. A twenty-four (24) item questionnaire was used for this study. Ten (10) items determined the demographic data of the participants; ten (10) items assessed the knowledge relating to CVD and four (4) items determined perceived susceptibility to CVD. The following criteria for evaluating knowledge regarding CVD risks were used:  $\geq 70\%$  correct answers = knowledgeable of CVD risks and  $< 70\%$

correct answers = not knowledgeable regarding CVD risks (Long et al., 2005).

Six hundred (600) questionnaires were administered to female students. The library, cafeteria, residence entrance halls, lecture halls and adjoining buildings were targeted. Ethical clearance was obtained from Senate Research Grants and Study Leave Committee of the participating university as well as the Registrar. Signed, informed consent was obtained from all participants. An information sheet explaining the purpose of the study was attached to every questionnaire. If there were any queries, the research assistants were available at all times to answer them immediately. Information obtained was handled with complete confidentiality. Participation was voluntary and participants were informed of their right to withdraw from the study at any time with no impunity.

Data obtained from the questionnaire were analyzed using the Statistical Package for the Social Sciences (SPSS) version 16.0. The data was subjected to both descriptive and inferential statistics. Demographic data were expressed as

means, standard deviations and percentages. Data analysis included cross-tabulations using the Chi-square test for association between knowledge of CVD, risk perception and socio-demographic variables. Alpha level was set at  $p < 0.05$ .

## Results

Four hundred and thirty eight (438) female students completed and returned the questionnaires. Thus, the overall response rate was 73%. The study sample had a mean age of 22 years (SD=5.0). More than half of the study sample (53.7%) classified themselves as Coloured and almost 30% as African/Black. More than 80% of the study sample was younger than 25 years, 14.3% between 25 and 44 years and 0.2% 45 years and older. No significant association were found between race and knowledge of CVD risks, age and knowledge of CVD risks as well as year of study and knowledge of CVD risks ( $p > 0.05$ ).

Overall, 56.8% of the study sample was classified as knowledgeable of CVD risks. Almost 71% of the participants identified breast cancer as being the greatest health risk for women with a mere 6.6% indicating heart disease. (Table 1).

Table 1 Distribution of knowledge of CVD risks

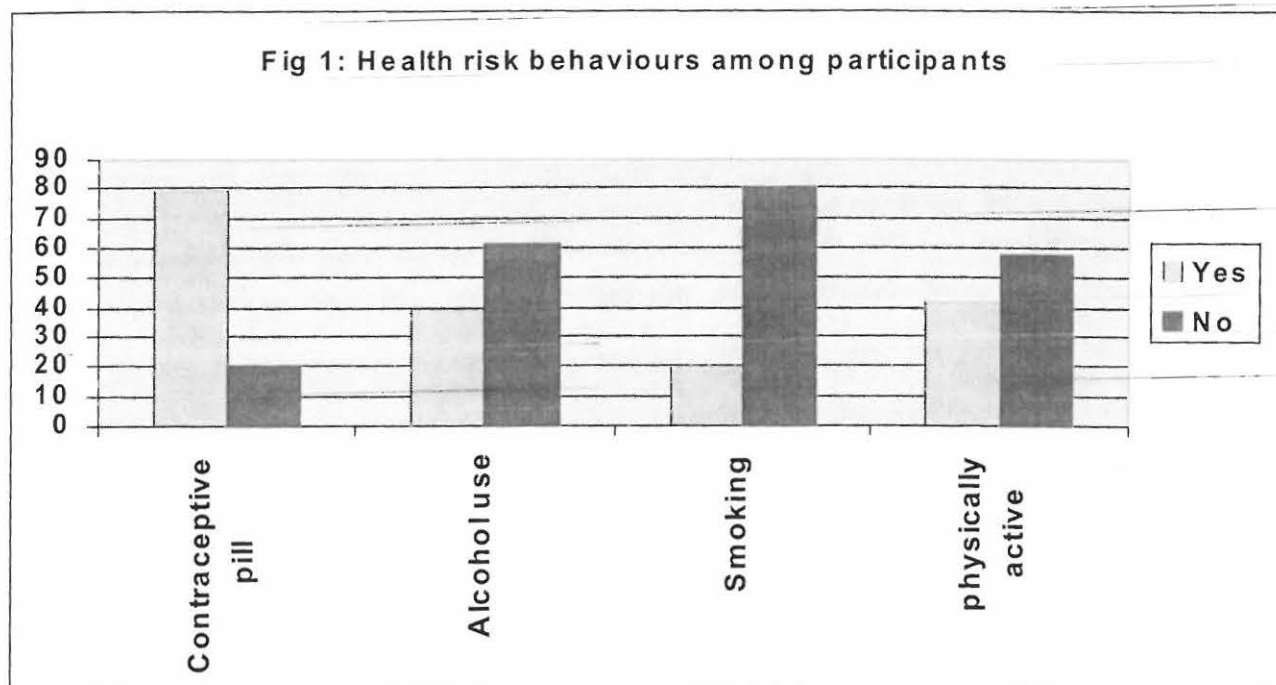
Question	YES		NO		MISSING	
	n	%	n	%	n	%
<b>Risk factors related to heart disease that you can control:</b>						
High blood pressure	348	79.5*	84	19.2	6	1.3
Family history	171	39.0	253	57.8*	14	3.2
Smoking	304	69.4*	127	29.0	7	1.6
Race	176	40.2	259	59.1*	3	0.7
<b>Risk factors related to heart disease that you cannot control:</b>						
Age	262	59.8*	173	39.5	3	0.7
Gender	272	62.1*	164	37.4	2	0.5
Physical inactivity	118	26.9	393	89.7*	6	1.3
Previous heart disease and stroke	295	67.4*	182	41.6	5	1.1
Racial group most affected by heart disease in South Africa (Indian/Asian)	73	16.7*	365	83.3	-	-
Disease females are most at risk of getting (heart disease)	29	6.6*	409	93.3		

\*correct answer

Among the participants, the White population (40%) was identified as the race most susceptible to CVD, with 32%, 17% and 11% classifying the African/Black, Indian/Asian and Coloured population respectively. None of the participants who classified themselves as African/Black (30%), rated the African/Black population as being most affected by CVD.

Approximately 51% and 84% of the study sample reported having a family history of CVD and having been informed of their risk of developing CVD, respectively. Significantly more Indian/Asian (64%) and White individuals (63%) reported having a family history of CVD ( $X^2 = 14.268$ ,  $p=0.003$ ). Significantly more students with a family history of

CVD reported being informed of the risk of developing CVD ( $X^2 = 11.552$ ,  $p=0.001$ ). More than 75% of the study sample did not perceive female university students as susceptible to the onset and risk of CVD. The results also showed that approximately 58% of the participants did not perceive themselves at risk of developing CVD. The prevalence of perceived susceptibility to the onset and risk of CVD varied significantly by having a family history of CVD and whether participants were informed of their risks. A highly significant relationship was found between risk perception and being informed of the risk of developing CVD ( $X^2 = 17.7820$ ;  $p = 0.000$ ) and having a family history of CVD ( $X^2 = 17.7820$ ;  $p=0.000$ ).



The participants engaged in a number of other behaviours that could increase their risk of developing CVD (Fig 1). Almost 20% of the study sample smoked and used the contraceptive pill whereas almost 40% reported alcohol use. Furthermore, 58% of the participants indicated that they are physically inactive, with a mere 12.0% exercising twice a week. No significant associations were found between socio-demographic variables and perceived risk for developing CVD ( $p>0.05$ ).

### Discussion

This study aimed to determine female students' knowledge and perception of cardiovascular disease risks. The results suggested that 43.2% of female university students were not knowledgeable regarding CVD risks. It therefore supports McMahan et al. (2007), who found that there are important opportunities to educate college students about CVD risk and perception.

The current results are of concern and coincide with research claiming that women are not knowledgeable regarding their risks of developing

CVD (Long et al., 2005; Bedinghaus et al., 2001; Meisler, 2001). Researchers have found that women's lack of knowledge regarding CVD may contribute to a higher risk of CVD, as women tend to focus on menopause and breast cancer, therefore ignoring specific risk factors that could lead to CVD (Long et al., 2005). Meisler (2001) found that 80% of women were unaware that CVD is the single leading cause of death and disability among women. This could be due to the fact that women are unable to identify their most important health concern and are therefore found to be less knowledgeable than men about CVD (Gettleman & Winkleby, 2000).

Furthermore, this study identified a need for increased knowledge and awareness regarding certain risk factors that contribute to the development and misdiagnosis of CVD, as more of the younger population needs to be aware of the atypical signs and symptoms of CVD (Epping-Jordan, Galea, Tutuitonga & Beaglehole, 2006; WHO, 2005). Primary prevention in the form of education and prevention regarding physical activity, smoking cessation and obesity prevention

is needed to target CVD prevention in the younger population, as university students has been identified as a population participating in unhealthy behaviours. It is an imperative step toward instilling healthy lifestyle habits that can be carried through life.

A further concern is the fact that breast cancer was identified as the greatest health risk for women by the majority of the study sample with a mere 6.6% indicating heart disease. This low perceived risk of women for developing heart disease represents an alarming trend which is consistent with other international studies (Collins, Dantico, Shearer & Mossman, 2004; Mosca et al., 2000). The reasons for this are unclear. As Collins et al. (2004) stated: 'It is possible that the fear of cancer actually stems from concern over the side effects of the disease or its treatment'. This misperception of cancer as the leading cause of death is important because it epitomizes a misconceived notion of the risk for chronic illnesses such as heart disease. Students may also feel that the possibility of developing heart disease lies too far in the future to incite concern, while breast cancer could pose a more immediate health risk.

Differences also exist with regard to female students' perception of CVD risk by ethnicity. Current results are confirmed by Birchfield (2003) and Anderson and Kessenich (2001) who also found that participants perceived Black women to be more at risk than White women to develop coronary artery disease or suffer a stroke. This is of great concern, as Norman et al. (2006) reported the highest death rates for heart and blood vessel diseases in South Africa to be found in the Indian population, followed by the Coloured population, while the White and Black/African populations have the lowest rates.

When asked to compare the likelihood of developing CVD with people of their age, more than half of the study sample (57.5%) did not feel that they were at risk. These results are in line with findings by Green, Grant, Hill, Brizzolara & Belmont (2003) who indicated that college students do not accurately perceive their risk of developing heart disease, because of the lack of perceived seriousness of the disease. Perceived susceptibility was determined to be an indicator of an individual's willingness to participate in risk-reduction behaviours for the prevention of heart disease (McMahan et al., 2007; Collins et al., 2004). The lack of perceived risk for CVD among women could impact on preventative behaviours practiced by females. Certain risky behaviours such as excessive alcohol intake, smoking and unhealthy diet are often exacerbated in the university environment. Female students are therefore more likely than women in general, to participate in these risky behaviours. The misconception that CVD is primarily a disease that affects men, furthermore contribute to women not perceiving themselves susceptible to CVD. Therefore, female university students need to be informed of their own susceptibility of developing CVD.

Vale (2000) found that students had some knowledge regarding risk management strategies but did not have the knowledge to carry out specific prevention methods. Results from the present study clearly show that some of the participants do practice risky behaviours such as smoking, physical inactivity and using the contraceptive pill. Women predisposed to CVD risk factors such as hypertension, obesity and smoking have an increased risk of heart disease when used in conjunction with oral contraceptives (Anderson and Kessenich, 2001). These findings coincide with studies that found that people with a low-risk profile

have a much lower incidence of cardiovascular disease (CVD) than those with one or more single risk factors (Khot et al., 2003), and the lowest incidence of heart disease appears to be among those who adhere to multiple risk-reducing behaviors (Stamler et al., 1999). While smoking is clearly associated with heart disease, a growing body of literature demonstrates that exercise and increased fruit and vegetable intake can reduce the risk of CVD (Bazzano et al., 2002).

### Study Limitations

The study sample was non-randomized, therefore generalization of the findings is restricted to female students of the participating university. The small number of some ethnic minorities in the study sample may limit the degree to which the findings can be generalized. Furthermore, content validity and reliability of the instrument was not addressed.

### Conclusion

Although more than 50% of the participants in the study were knowledgeable regarding risk factors for CVD, it is still evident that women, specifically the younger population, should be made aware of their risk of developing CVD. Because many heart disease risk factors may be managed through lifestyle modification, public education directed at altering personal behaviours remains the most effective strategy for reducing disease risk. Programmes that focus on primary prevention need to be developed to promote healthy lifestyles that are cultural and gender appropriate for the university population. It is vital to our nation's health that young female individuals are educated regarding the identification and modification of risk factors for CVD, an illness traditionally thought of as a "man's disease". Although heart disease is manifested primarily in older age groups, pathogenesis begins early in life. Therefore, risk

management strategies implemented at a young age may have a significant impact on CVD progression. As Lipp, Deane and Trimble (1996) concluded: "Interventions must begin in early life if heart disease is to be prevented for the reason that behaviours learned at young ages are most likely to be carried on to reduce CVD".

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