The discrepancy between Perceived and Estimated Absolute Risks of Coronary Heart Disease in Middle Eastern Women: Implications for Cardiac Rehabilitation

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A thesis submitted in fulfilment of the requirements for the degree of

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Dedicated to:

My father, for his encouragement and support

My mother, for her endless and unconditional love

and

My husband who came into my life mid-journey and brought

with him love and happiness
Acknowledgments

I have been exceedingly fortunate to have the intellectual supervision, mentoring, and guidance of Professor Patricia Davidson. She is one of the most thoughtful, compassionate and caring people that I am ever likely to have the good fortune of knowing. Her moral support and patience eased my transition to studying and living in Australia, and made it possible to bring this journey to fruition. I shall always be grateful for her guidance, support and encouragement.

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Conference Presentations


Refereed Journal Articles


Thesis Certification

I, Leila Gholizadeh, declare that this thesis, submitted in fulfilment of the
requirements for the award of Doctor of Philosophy in the School of Nursing,
College of Health and Science, University of Western Sydney, is wholly my own
work unless otherwise referenced or acknowledged. I hereby declare that I have not
this document, either in full or in part, to any other educational institution.

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(Signature)
Table of Contents

LIST OF TABLES ..................................................................................................................... 1
LIST OF FIGURES .................................................................................................................... 2
ABBREVIATIONS ..................................................................................................................... 3
ABSTRACT .............................................................................................................................. 5
CHAPTER ONE BACKGROUND ............................................................................................... 7
1.0 INTRODUCTION .................................................................................................................. 8
  1.0.1 RESEARCH QUESTIONS .................................................................................................. 9
1.1 THE GLOBAL BURDEN OF CVD ........................................................................................ 11
1.2 THE GLOBAL PREVALENCE OF CVD IN WOMEN .......................................................... 12
1.3 THE PREVALENCE OF CVD IN AUSTRALIAN WOMEN ................................................ 13
1.4 GENDER DIFFERENCES AND CHD ................................................................................ 14
  1.4.1 CHD RISK FACTORS IN WOMEN .................................................................................. 16
    1.4.1.1 Hyperlipidaemia ......................................................................................................... 18
    1.4.1.2 Current smoking ......................................................................................................... 19
    1.4.1.3 Diabetes ..................................................................................................................... 20
    1.4.1.4 Hypertension .............................................................................................................. 20
    1.4.1.5 Obesity ....................................................................................................................... 21
    1.4.1.6 Psychosocial distress ................................................................................................. 21
    1.4.1.7 Lack of daily consumption of vegetables and fruit ..................................................... 22
    1.4.1.8 Lack of exercise ......................................................................................................... 22
    1.4.1.9 Alcohol intake .......................................................................................................... 23
    1.4.1.10 Genetic factors and ethnicity .................................................................................... 23
    1.4.1.11 Age and menopausal status ..................................................................................... 24
1.6 PRIMARY, SECONDARY AND TERTIARY CHD PREVENTION ........................................ 25
  1.6.1 CHD RISK ASSESSMENT ................................................................................................ 26
  1.6.2 CARDIAC REHABILITATION: A KEY SECONDARY PREVENTION STRATEGY .......... 28
    1.6.2.1 Women and cardiac rehabilitation ............................................................................. 29
    1.6.2.2 Challenges of current cardiac rehabilitation programmes ...................................... 30
1.7 CARDIOVASCULAR HEALTH DISPARITIES ................................................................. 32
  1.7.1 INFLUENCE OF CULTURE ON CARDIOVASCULAR HEALTH .................................... 33
  1.7.2 IMPACT OF IMMIGRATION AND ACCULTURATION ON CHD RISK FACTORS ......... 34
  1.7.3 IMPERATIVE FOR CULTURAL COMPETENCE ............................................................... 36
  1.7.4 CULTURALLY COMPETENT HEALTH SERVICES ......................................................... 38
1.8 RATIONALE FOR ADDRESSING CHD RISK IN MIDDLE EASTERN WOMEN ............... 39
1.10 CONCLUSION .................................................................................................................... 40
CHAPTER TWO RISK PERCEPTION ...................................................................................... 42
2.0 INTRODUCTION .................................................................................................................. 43
2.1 THEORETICAL MODELS .................................................................................................. 44
### 3.7 FOCUS GROUPS

- **3.7.1** Perceptions of CHD risk
- **3.7.2** Estimated absolute risk of CHD

### 3.8 PRESENTATION OF THE RESEARCHER IN THE STUDY PROCESS

- **3.8.1** Data Management and Storage
- **3.8.2** Ethical Consideration and Protection of Participants

### 3.9 DATA ANALYSIS

- **3.9.1** Quantitative Data Analysis
- **3.9.2** Qualitative Data Analysis

### 3.10 QUALITATIVE DATA QUALITY

- **3.10.1** Project Governance
- **3.10.2** Qualitative Data Quality

### 3.11 PROJECT GOVERNANCE

- **3.11.1** Ethical Consideration and Protection of Participants
- **3.11.2** Data Management and Storage

### 3.12 ETHICAL CONSIDERATION AND PROTECTION OF PARTICIPANTS

- **3.12.1** Ethical Consideration and Protection of Participants

### 3.13 DATA MANAGEMENT AND STORAGE

- **3.13.1** Data Management and Storage

### 3.14 SUMMARY

- **3.14.1** Summary

### CHAPTER FOUR STUDY ONE

- **4.0** Introduction
- **4.1** Study Aim and Questions
- **4.2** Study Design
- **4.3** Conducting the Focus Groups
- **4.4** Survey Results
- **4.5** Findings of the Focus Groups
- **4.6** Discussion
- **4.7** Summary

### CHAPTER FIVE STUDY TWO

- **5.0** Introduction
- **5.1** Study Aim
- **5.2** Study Design
- **5.3** Study Results
5.3.1 STATISTICAL ANALYSIS I: DESCRIPTIVE ANALYSIS ............................................................... 180
5.3.2 STATISTICAL ANALYSIS II: INFERENTIAL ANALYSIS............................................................ 189
5.4 DISCUSSION ........................................................................................................................................... 193
  5.4.1 CHD RISK FACTOR PROFILE OF THE PARTICIPANTS............................................................... 193
  5.4.2 THE RELATIONSHIP BETWEEN PERCEIVED AND ESTIMATED ABSOLUTE RISK................... 194
  5.4.3 CASUAL ATTRIBUTIONS FOR CHD ............................................................................................. 197
  5.4.4 PSYCHOLOGICAL CONCERNS .................................................................................................. 200
  5.4.5 WHAT DIFFERENCE DOES MIGRATION MAKE? ..................................................................... 202
5.5 LIMITATIONS AND STRENGTHS OF THIS STUDY ................................................................. 203
5.6 SUMMARY ............................................................................................................................................... 204
CHAPTER SIX CONCLUSION ......................................................................................................................... 206
6.0 INTRODUCTION ......................................................................................................................................... 207
  6.1.1 POLICY ......................................................................................................................................... 208
  6.1.2 RESEARCH .................................................................................................................................... 211
  6.1.3 PRACTICE ...................................................................................................................................... 214
6.1 RECOMMENDATIONS ............................................................................................................................... 216
6.5 CONCLUSION ............................................................................................................................................ 218
REFERENCES .................................................................................................................................................. 220
GLOSSARY ...................................................................................................................................................... 253
APPENDIXES .................................................................................................................................................... 254
## List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 3.1</td>
<td>The Middle-Eastern Study schemata</td>
<td>85</td>
</tr>
<tr>
<td>Table 3.2</td>
<td>Classification of BMI</td>
<td>90</td>
</tr>
<tr>
<td>Table 4.1</td>
<td>Characteristics of the focus groups</td>
<td>118</td>
</tr>
<tr>
<td>Table 4.2</td>
<td>Socio-demographic characteristics and CHD risk factors of participants (n=66)</td>
<td>122</td>
</tr>
<tr>
<td>Table 4.3</td>
<td>Biochemical measurements of the participants (n=16)</td>
<td>124</td>
</tr>
<tr>
<td>Table 4.4</td>
<td>Psychological status of the study participants (n=66)</td>
<td>125</td>
</tr>
<tr>
<td>Table 4.5</td>
<td>Psychological status of the participants and their causal attribution for CHD (n=66)</td>
<td>134</td>
</tr>
<tr>
<td>Table 5.1</td>
<td>Socio-demographic characteristics and CHD risk factors of participants (n=121)</td>
<td>181</td>
</tr>
<tr>
<td>Table 5.2</td>
<td>Biochemical measurements of the participants (n=121)</td>
<td>184</td>
</tr>
<tr>
<td>Table 5.3</td>
<td>Psychological status of the study participants (n=121)</td>
<td>184</td>
</tr>
<tr>
<td>Table 5.4</td>
<td>Perceived absolute and relative risk of CHD in the next 5 and 10 years (n=121)</td>
<td>186</td>
</tr>
<tr>
<td>Table 5.5</td>
<td>Participants' self-reported diagnosis and their personal causal attributions</td>
<td>188</td>
</tr>
<tr>
<td>Figure Number</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Figure 1.1</td>
<td>A description of the Middle-Eastern Study design</td>
<td>10</td>
</tr>
<tr>
<td>Figure 1.2</td>
<td>Distribution of major causes of mortality worldwide 1990 and a projection to 2020</td>
<td>12</td>
</tr>
<tr>
<td>Figure 1.3</td>
<td>Mortality due to CVD in men and women between years 1979-2004 in the USA</td>
<td>16</td>
</tr>
<tr>
<td>Figure 1.4</td>
<td>A conceptual model to explain epidemiological transition, altered lifestyles and development of CHD</td>
<td>17</td>
</tr>
<tr>
<td>Figure 1.5</td>
<td>Settler arrivals by region of last residence, Australia 1947 to 1999</td>
<td>34</td>
</tr>
<tr>
<td>Figure 2.1</td>
<td>Adams’ idea about risk thermostat</td>
<td>45</td>
</tr>
<tr>
<td>Figure 2.2</td>
<td>Health Belief Model</td>
<td>47</td>
</tr>
<tr>
<td>Figure 2.4</td>
<td>The Extended Parallel Process Model</td>
<td>52</td>
</tr>
<tr>
<td>Figure 2.5</td>
<td>Risk perception in risk reducing behaviours: A Socio-cultural conceptual model</td>
<td>63</td>
</tr>
<tr>
<td>Figure 4.1</td>
<td>Self-reported family health history</td>
<td>123</td>
</tr>
<tr>
<td>Figure 4.2</td>
<td>Self-reported personal health history (n=66)</td>
<td>123</td>
</tr>
<tr>
<td>Figure 4.3</td>
<td>Five-year CVD risk (n=46)</td>
<td>126</td>
</tr>
<tr>
<td>Figure 4.4</td>
<td>Perceived personal absolute and relative CHD risk of the participants according to their CHD risk categories</td>
<td>127</td>
</tr>
<tr>
<td>Figure 4.5</td>
<td>Causal attributions to CHD in general</td>
<td>128</td>
</tr>
<tr>
<td>Figure 4.6</td>
<td>Perceived personal absolute CHD risk of the participants according to their country of birth</td>
<td>135</td>
</tr>
<tr>
<td>Figure 4.7</td>
<td>Summary of perceived sources of stress by the study participants</td>
<td>145</td>
</tr>
<tr>
<td>Figure 4.8</td>
<td>Summary of barriers to risk reducing behaviours among the participants</td>
<td>149</td>
</tr>
<tr>
<td>Figure 5.1</td>
<td>Self-reported family health history</td>
<td>182</td>
</tr>
<tr>
<td>Figure 5.2</td>
<td>Self-reported personal health history</td>
<td>182</td>
</tr>
<tr>
<td>Figure 5.3</td>
<td>Perceived personal absolute and relative CHD risk in the next 5 years according to the participants’ estimated risk</td>
<td>187</td>
</tr>
<tr>
<td>Figure 5.4</td>
<td>Causal attributions for CHD in general</td>
<td>189</td>
</tr>
</tbody>
</table>
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
</tr>
<tr>
<td>ACRA</td>
<td>Australian Cardiac Rehabilitation Association</td>
</tr>
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<td>AHA</td>
<td>American Heart Association</td>
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<td>AIHW</td>
<td>Australian Institute of Health and Welfare</td>
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<tr>
<td>BMI</td>
<td>Body Mass Index</td>
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<td>BP</td>
<td>Blood Pressure</td>
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<td>BUN</td>
<td>Blood Urea Nitrogen</td>
</tr>
<tr>
<td>CHD</td>
<td>Coronary Heart Disease</td>
</tr>
<tr>
<td>Cr</td>
<td>Creatinine</td>
</tr>
<tr>
<td>CR</td>
<td>Cardiac Rehabilitation Programme</td>
</tr>
<tr>
<td>CRQ-Ver. A</td>
<td>CHD risk factor Questionnaire- Version A</td>
</tr>
<tr>
<td>CRQ-Ver. B</td>
<td>CHD risk factor Questionnaire- Version B</td>
</tr>
<tr>
<td>CVD</td>
<td>Cardiovascular Disease</td>
</tr>
<tr>
<td>DBP</td>
<td>Diastolic Blood Pressure</td>
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<td>FBS</td>
<td>Fasting Blood Sugar</td>
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<tr>
<td>GFR</td>
<td>Glomerular Filtration Rate</td>
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<td>HbA1c</td>
<td>Glycated Haemoglobin A</td>
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<tr>
<td>HDL-C</td>
<td>High-Density Lipoprotein Cholesterol</td>
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<tr>
<td>LDL-C</td>
<td>Low-Density Lipoprotein Cholesterol</td>
</tr>
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<td>MI</td>
<td>Myocardial Infarction</td>
</tr>
<tr>
<td>NSW</td>
<td>New South Wales</td>
</tr>
<tr>
<td>PCRQ-Ver.A</td>
<td>Perception of CHD Risk Questionnaire- Version A</td>
</tr>
<tr>
<td>PCRQ-Ver.B</td>
<td>Perception of CHD Risk Questionnaire- Version B</td>
</tr>
<tr>
<td>SBP</td>
<td>Systolic Blood Pressure</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>SWAHS</td>
<td>Sydney West Area Health Service</td>
</tr>
<tr>
<td>The DASS 42</td>
<td>Depression, Anxiety and Stress Scale</td>
</tr>
<tr>
<td>TG</td>
<td>Triglycerides</td>
</tr>
<tr>
<td>The UK</td>
<td>The United Kingdom</td>
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<td>The USA</td>
<td>The United States of America</td>
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<tr>
<td>UWS</td>
<td>University of Western Sydney</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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<td>WHR</td>
<td>Waist to Hip Ratio</td>
</tr>
</tbody>
</table>
Abstract

Coronary heart disease (CHD) is the major cause of morbidity and mortality globally. While primary and secondary prevention programmes indisputably reduce the burden of CHD and increase quality of life, they are often underused, particularly by women and ethnic minorities. Lower referral rate, inaccessibility of services, being female, lack of support, insufficient income, impaired health literacy, inappropriateness of the programmes and the failure of health care organisations and programmes to provide culturally competent care to diverse racial, ethnic and cultural groups are some contributing factors. The use of health care services also appears to be influenced by perceived vulnerability to CHD. An individual’s subjective judgment about the characteristics and severity of a risk, that is the perception of risk, and causal attributions play an important role in responding to risk. Attitudes towards CHD risk and the associated risk factors such as smoking, diet, physical activity and obesity are mainly underpinned within cultural beliefs and practices. The value placed on adopting favourable health seeking behaviours, and a willingness to comply with medical advice are also often related to cultural beliefs, values and experiences. There is, therefore, a need to explore CHD risk perception in culturally diverse populations. Understanding these risks can help health practitioners tailor health messages and services more effectively to facilitate behaviour change in target groups, which is critical in the management of CHD. This thesis aimed to explore the relationship between Middle Eastern women’s perceived and estimated absolute risk of CHD to inform primary and secondary prevention programmes. This thesis comprised two discrete, yet interrelated studies and employed a mixed method to elicit the participants’ perception of general and personal CHD risk. Focus groups were used to capture the collective views of
migrant Turkish, Persian and Arab Middle Eastern women about their perceptions of the risk of developing CHD, causal attributions and risk reducing behaviours. The three main themes that emerged from the focus group discussions were: (a) Middle Eastern women underestimated the risk of CHD; (b) stress is a pervasive factor in the lives of Middle Eastern women; and (c) Middle Eastern women face many barriers to reduce their risk of CHD.

Participants’ biological, behavioural and socio-economical risk factors showed that the study participants were at increased CHD risk due to high prevalence of some risk factors such as high blood cholesterol level, obesity, inactivity and psychological distress. Yet, the participants underestimated their personal CHD risk and perceived themselves to be at increased risk of psychological disorders such as depression. Further, those who perceived some level of increased CHD risk attributed it more to their psychological status rather than lifestyle factors. Underestimation of the risk, inaccurate causal attributions, low socio-economic status and low health literacy accompanied with lack of culturally and linguistically competent programmes to assist women in protecting their cardiovascular health are some identified barriers to CHD risk reducing behaviours among Middle Eastern women. Findings of this study have significant implications for cardiac rehabilitation services to develop culturally and linguistically competent programmes to communicate CHD risk efficiently to Middle Eastern women while taking into account cultural differences in beliefs and traditions, socioeconomic status and health literacy. These differences should be considered in CR design, implementation and evaluation.
Chapter One

Background
1.0 Introduction

Cardiovascular disease (CVD) refers to conditions involving the heart or blood vessels,\(^3\) and is a cause of disease burden across developed and developing countries.\(^4\) The major manifestations of CVD are coronary heart disease (CHD), stroke and peripheral arterial disease. These conditions share common risk factors and often coexist.\(^3\) More than half of the deaths and disability from CHD can be prevented through public health initiatives and the actions of individuals to reduce modifiable risk factors, such as high blood pressure, high blood cholesterol and smoking.\(^5\) Although the modifiable risk factors for CHD are generally well identified and consistent among most populations throughout the world,\(^5\) risk factor modification is a complex and multi-faceted phenomenon.\(^6\) Reducing the burden of CHD requires population-wide interventions as well as an understanding of the way individuals perceive the risk and take action to minimise harm. Yet, through influencing individuals’ perceptions and beliefs about their CHD risk, health care professionals can increase the chance of people adopting healthier lifestyles.\(^7\) This includes not only considering individual factors but also the socio-cultural factors impacting on risk perception and behaviours.\(^8\) This thesis describes the perception of CHD risk among Middle Eastern women and their estimated absolute risk. Specifically, the study aimed to examine CHD risk perception from a socio-cultural perspective, the extent to which these perceptions may impact on CHD risk reducing behaviours, and the implications of these findings for policy, practice and research. A socio-cultural perspective considers how attributes of the individual influence their knowledge, attitudes and beliefs and as a consequence their behaviours.\(^8\)
1.0.1 Research questions

The study addressed the following research questions:

1. In what way do Middle Eastern women perceive CHD risk and risk factors in general?

2. In what way do Middle Eastern women perceive their personal CHD risk and risk factors?

3. What behaviours do Middle Eastern women employ to reduce their risk for CHD?

4. What is the estimated absolute CHD risk of Middle Eastern women?

5. Is there a relationship between estimated and perceived CHD risk and risk factors among Middle Eastern women?

6. What are the associations between socio-demographic, clinical and psychological risk factors and risk perception?

The Middle Eastern Women Study is composed of two discrete, yet interrelated studies as shown in Figure 1.1. Study One explores the perception of CHD risk among Middle Eastern women without heart disease. These perceptions are then compared with the estimated absolute risk of these participants developing a cardiac event. Study Two makes the same comparison among Middle Eastern women with heart disease. Although CVD and CHD have been used interchangeably in the literature, the focus of this study is CHD and the term cardiac event as used in this study refers to myocardial infarction (MI), angina pectoris, unstable angina, congestive heart failure, and sudden cardiac death.
Factors influencing an individual’s perception of CHD risk and, in turn, risk reducing behaviours are presented in a conceptual model in Chapter Two (see Figure 2.5). The unique considerations of this conceptual model in reducing CHD risk in Middle Eastern women are further discussed in Chapter Six.
CHAPTER 1 BACKGROUND

This chapter presents the burden of CHD both internationally and in Australia. It also provides a background to CHD risk perception. The reasons for the disparities in cardiovascular health outcomes, the barriers to accessing primary and secondary cardiovascular prevention services and methods of CHD risk assessment are discussed.

1.1 The global burden of CVD

Declining stroke rates since the 1920s coupled with a developed world reduction in CHD since the 1960s have afforded cautious optimism about the capacity of both primary and secondary prevention strategies in improving CVD health outcomes.\(^9\) Such prevention strategies include smoking cessation and cholesterol lowering techniques.\(^10\),\(^11\) Despite a significant decline in mortality rates over the past 25 years, CVD remains the leading cause of death for men and women of almost all racial and ethnic groups.\(^12\) Further, some CHD risk factors, such as obesity, inactivity and diabetes are increasing worldwide. These upward trends are particularly apparent among disadvantaged populations including: women; low socio-economic groups and minorities.\(^13\)-\(^15\) This may lead to an increase in the prevalence of CHD in the future. Accordingly, it is projected that by 2020, the global burden of heart disease will increase, both in relative and absolute terms and 34-37% of all deaths will be attributable to CVD\(^16\),\(^17\) Figure 1.2 illustrates the distribution of major causes of death in 1990 and a projection to 2020.
Those with the greatest risk of mortality are the socio-economically disadvantaged and some ethnic and cultural group. Despite this elevated risk, health disparities exist in the use of preventive programmes for CHD. Ethnic and gender differences and some socio-economic factors, such as fewer years of education, lower income and uninsured status are associated with less likelihood of participating in primary and secondary prevention programmes. Moreover, language and cultural barriers and perception of risk are increasingly becoming evident factors in access to health services.

1.2 The global prevalence of CVD in women

Cardiovascular disease is the major cause of death among women, accounting for up to one-third of all deaths. This equates to 8.5 million deaths annually among women worldwide. However, the prevalence and distribution of heart disease in women has dramatically changed over the last few decades. From 1965 to 1990, CVD related mortality in both sexes fell by almost 50% in most developed countries, such as

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**Figure 1.2 Distribution of major causes of mortality worldwide 1990 and a projection to 2020**

Australia, Canada, France and the United States of America (USA), and by 60% in Japan. Other parts of Western Europe reported modest declines. In 1988-1998, death from heart disease in women declined by 41% in the United Kingdom (UK), 46% in Finland and by 44% in Ireland. The USA has also reported a decline in mortality rates due to CHD and CVD among women by 1.1% and 5.7% respectively from 1999 to 2003. However, there are no reports of further favourable downward trends in other countries. Data describing trends in mortality due to CVD among women in developing countries are limited, yet, the available data suggest that about half of all deaths of women aged over 50 years in these countries are attributable to CVD. In addition, some risk factors, such as diabetes, obesity and inactivity are increasing noticeable in developing countries, particularly among women. It is estimated that by 2040, women will represent an even higher proportion of CVD deaths than men in some countries, including Russia, Brazil, India, China and South Africa. It is crucial, therefore, to direct research on cardiovascular disease to understand and reduce the global increase in CVD mortality and risk factors in women.

1.3 The prevalence of CVD in Australian women
Cardiovascular disease is also the biggest killer of women in Australia, with age-standardised death rates in 2000 reported at 173 per 100,000. For example, the risk of having CHD in future for a 40-year-old is calculated to be 1 in 2 for men and 1 in 3 for women. Although the incidence of CHD is greater in men, the prevalence of CVD is estimated to be higher in women (18.8% women versus 14.8% men), most likely because of the extended life expectancy for women. Consequently, there has been a shift in the burden of heart disease to elderly women. This is demonstrated
by the difference in the number of deaths from heart failure between sex, which 1.7
times higher in women than men.\textsuperscript{30}

Cardiovascular health was established as one of the national health priority areas in
1996 in Australia due to the high burden of CVD and the potential for prevention in
this area.\textsuperscript{27} For example, death rates from CVD among women declined at a rate of
3.7\% per year, culminating in a total decline of 35.2\% between 1987 to 1998.\textsuperscript{27}
Improvements in management of CVD using primary, secondary and tertiary
prevention strategies, such as prevention and treatment of high blood cholesterol and
hypertension, have been largely contributed to this achievement.\textsuperscript{31}

\section*{1.4 Gender differences and CHD}
A growing body of literature on CHD argues the biological, psychological,
behavioural and environmental differences between men and women. Women differ
from men in terms of coronary artery anatomy, hormonal effects on the
cardiovascular system and body fat distribution.\textsuperscript{32} Furthermore, there are gender-
based differences in the relative magnitude of risk factors for the development and
prognosis of CHD in women, such as the greater importance of hypertension,
smoking, metabolic syndrome and potentially psychological factors.\textsuperscript{33, 34} Gender-
based differences have also been reported in relation to the presentation of
symptoms, utilisation of diagnostic tests, treatments and heart disease outcomes.\textsuperscript{35-37}
The prognosis of CHD is worse in women than in men.\textsuperscript{21} For instance, at age 40 and
older 23\% of women will die within one year after MI compared to 18\% of men;\textsuperscript{38}
35\% of female survivors of heart attack will have another heart attack within six
years compared to 18\% of men;\textsuperscript{38} 46\% of female heart attack survivors will be
disabled with heart failure within six years compared to only 22\% of men. In
addition, women are almost twice as likely as men to die following bypass surgery. These disparities have been attributed, in part, to the older age of women at the time of their cardiac event. On average, ischaemic heart disease appears in women 10 to 15 years later than men. Consequently, women are more likely to suffer from co-morbid conditions, such as diabetes and hypertension, resulting in further challenges in the treatment of their condition. Yet, some studies reported higher mortality and morbidity in women after MI, even when controlling for age, disease severity and co-morbidities.

Further, women are underrepresented in most studies related to heart disease, comprising only 25% of all participants in clinical studies. Thus decisions about the prevention and treatment of heart disease in women are often based on strategies developed and tested in men and it is not clear to what extent the results conducted on men are applicable to women. In addition, health care providers have often ignored the burden of CHD in women, likely resulting in disparities in referral patterns, treatment and prognosis, and contributing to poorer outcome compared with men. Further, the gender based disparities in CVD health may be explained by less causal attributions to the modifiable risk factors and perceived lower personal CHD risk by women. These factors may negatively affect adaptive lifestyle changes and treatment seeking behaviours for cardiac events, impacting on health related outcomes. Together, these factors contribute to the fact that improvements in the management of CHD have been less pronounced in women than men internationally. These differences are reflected in Figure 1.3 illustrating CVD mortality trends for man and women between 1979 and 2004 in the USA.
Figure 1.3  Mortality due to CVD in men and women between years 1979-2004 in the USA


1.4.1 CHD risk factors in women

Coronary heart disease refers to the narrowing or blockage of the coronary arteries caused by athermanous plaques within the walls of the arteries that supply myocardium. The development of CHD occurs over decades with many people remaining asymptomatic for the majority of this period. The aetiology and progression of CHD is related to a complex interplay of genetic, biological, behavioural, economic and social determinants. Factors such as diet, smoking and level of physical activity all influence blood pressure, blood cholesterol levels and body weight, increasing the risk of CHD. Key epidemiological and lifestyle changes that have influenced the development of CHD are illustrated in a conceptual model in Figure 1.4.
There is evidence of greater contribution of some risk factors to the development of CHD in women, such as high blood triglycerides and low high-density lipoprotein cholesterol (HDL-C), with the mechanisms remaining unknown. Diabetes also appears to be a stronger contributing factor for developing CHD in women.\textsuperscript{49} Despite these differences, available data clearly show that the major risk factors have a similar impact on absolute CHD risk in women as in men. INTERHEART, a global
case-control study of risk factors for MI, showed that about 80% of heart attacks occur in women who have a single major risk factor, including high blood pressure, cholesterol, smoking or diabetes. Moreover, this study was able to predict 94% of acute myocardial infarctions in women using nine risk factors. These factors are potentially amenable to modification which implies that women can take an active role in prevention of CHD. These risk factors are apoprotein B/apoprotein A\textsubscript{1} (Apo B/Apo A\textsubscript{1}), current smoking, diabetes, hypertension, abdominal obesity, psychosocial factors, lack of daily consumption of vegetables and fruit, a lack of regular exercise and alcohol drink.

Although the major risk factors for CHD are similar in men and women. The unique considerations of these risk factors in women are discussed below.

1.4.1.1 Hyperlipidaemia

High blood cholesterol is estimated to cause 56% of global CHD. High levels of low-density lipoprotein cholesterol (LDL-C) and low levels of high-density lipoprotein (HDL) significantly raise the risk of CHD, with the latter being the most significant predictor of mortality from heart disease in women. Further, the Apoprotein B (Apo B)/Apoprotein A\textsubscript{1} (Apo A\textsubscript{1}) ratio predicts the risk of developing CHD in both men and women.

Although declines in cholesterol levels have been seen in both men and women across ethnic groups and in all educational status, these changes have not been as significant in women as men internationally. In 1999-2000, about 50% of Australian adults both men and women (aged 25 years and over) had blood cholesterol levels above 5.5 mmol/L.
1.4.1.2 Current smoking

Smoking causes about 30% of CVD deaths globally.\textsuperscript{21} It is the leading preventable risk factor for CHD in women. It poses a higher risk for women than men,\textsuperscript{54} particularly after menopause.\textsuperscript{55} Fortunately, there has been a decline in the rates of smoking for both women and men in many developed countries over recent decades.\textsuperscript{56} A number of anti-smoking campaigns have been successful in reducing smoking rate, such as increasing taxes, labelling cigarette packages with clear health warnings, restricting tobacco advertising in all media, implementing smoke free places, in public, open and some enclosed areas.\textsuperscript{57} In Australia, for example, 22\% of female adults were smoking in 1995, decreasing to 20\% in 2004-05, after adjusting for age differences.\textsuperscript{58} Unfortunately, the decline in smoking rates among women has not been as remarkable as for men internationally. For example, in Japan, the Hisayama study (2003)\textsuperscript{59} documented a 26.4\% decrease in smoking rates for men compared to 9.9\% for women. Moreover, there have been recent trends towards more women smoking in younger age groups in some countries, such as Australia, Germany, Finland and England.\textsuperscript{9,60,61} For example, among teenagers, 14\% of boys and 16\% of girls smoked daily in 2001 in Australia.\textsuperscript{53}

Tobacco use also appears to be influenced by ethnicity and cultural factors. Hispanic and Asian women, for example, have the lowest rates of smoking in the USA\textsuperscript{52} while aboriginal women have disproportionately higher rates of smoking in Canada and Australia.\textsuperscript{62,63} According to the Australian Bureau of Statistics 46\% of Indigenous women were smoking in 1994 compared with 20\% of non-Indigenous women.\textsuperscript{62} Furthermore, in some communities, the prevalence of smokeless tobacco, such as chewing tobacco, is dramatically high among women.\textsuperscript{64,65}
1.4.1.3 Diabetes

The global prevalence of diabetes, which was 4.0% in 1995, is projected to rise to 5.4% by the year 2025.\textsuperscript{21} This projection is particularly worrying for women, as diabetes appears to be a stronger risk factor for developing CHD in women than men.\textsuperscript{21, 54} Women with diabetes are eight times as likely to develop CHD, compared to non-diabetic women.\textsuperscript{21, 60} In keeping with international statistics, Australia is experiencing an increasing trend in diabetes, with the prevalence among adult Australian females reaching 6.8% in 2002.\textsuperscript{66}

Increased energy intake from refined foods and a sedentary lifestyle, resulting in excess weight and insulin resistance, are partly responsible for the increased rate of Type 2 diabetes internationally.\textsuperscript{4} Further, attitudes toward food preferences and management of diabetes, are largely embedded in cultural beliefs. For example, the results of a study conducted in Kashmir showed that overall attitudes toward management of diabetes among participants were to enjoy life and leave the rest to God.\textsuperscript{67}

1.4.1.4 Hypertension

About 13% of global fatalities are caused by high blood pressure.\textsuperscript{24} Hypertension is considered a strong risk factor for developing CHD in women,\textsuperscript{68} as even a moderate elevation of blood pressure increases the risk by 3.5 times.\textsuperscript{69} Although, the proportion of females with high blood pressure and/or receiving treatment has declined significantly since the 1980s in many developed countries,\textsuperscript{56} considering the prevalence rate of 27% in women, over the age of 25, in 2000, blood pressure still has the potential to be further modified among Australian women.\textsuperscript{53}
1.4.1.5 Obesity

About 21% of CHD global risk is attributable to a body mass index (BMI) greater than 21 kg/m². The BMI does not, however, differentiate between body mass due to body fat or muscular build. It is suggested that waist circumference be used as an indicator of obesity, as it appears to be a stronger predictor of CHD than BMI.

Beliefs toward obesity are highly influenced by cultural norms. Being overweight is still valued and regarded as a sign of wealth and well-being and is not considered to be a risk factor for CHD in some communities such as African women. These attitudes accompanied by urbanisation and the availability of cheap, high-calorie foods have led to a significant rise in the incidence of obesity, particularly among women internationally. For example, 27% of Australian women aged 25 to 64 years were overweight and obese in 1980. This rose to 47% in 1999-2000.

1.4.1.6 Psychosocial distress

Recent studies provide clear evidence that psychosocial factors, including depression, anxiety, personality type, chronic life stress, social isolation and lower socio-economic status contribute significantly to the pathogenesis and prognosis of CHD. A meta-analysis of 11 studies also concluded that depression predicts the development of CHD in initially healthy people. Further, a systematic review by an Expert Working Group of the National Heart Foundation of Australia concluded that there is a strong and consistent evidence of relationships between CHD risk and depression, social isolation and lack of social support. The increased risk contributed by these psychosocial factors was estimated to be similar to smoking, Hyperlipidaemia and hypertension. Psychosocial distress is reported to be a
stronger risk factor in women compared to men, however, the mechanisms need to be further investigated. Further, the prevalence of major depression among cardiac patients is about three times higher than the general population. These factors have been related to poorer health outcomes in cardiac patients, increased mortality rate, greater cardiac re-hospitalisations and reduced quality of life. Middle Eastern immigrant women in Australia are potentially experiencing high levels of psychological distress due to a range of factors, such as social isolation. These factors may impact on these women’s CHD risk as well as propensity to reduce the risk.

1.4.1.7 Lack of daily consumption of vegetables and fruit

As a significant source of antioxidants, fruits and vegetables play an important protective role in cardiovascular diseases. Further, consumption of vegetables and fruit decreases fat intake. In the INTERHEART study, daily consumption of fruits and vegetables was related to a 30% relative MI risk reduction.

1.4.1.8 Lack of physical activity

Lack of physical activity has consistently been associated with an increased risk of CHD, with 22% of CHD deaths being attributable to sedentary lifestyle globally. A shift from physically demanding work to a largely sedentary industrial and office-based work has resulted in undertaking less physical activity. Significantly, 60% to 85% of the world’s population, from both developed and developing countries, do not carry out sufficient physical activity to gain health benefits. The statistics are more disappointing among women. In Australia, for example, the proportion of women over 18 engaging in regular physical activity fell from 36% in 1990 to 33.8%
in 1995 and 31% in 2000. A further concern is the increasing rate of physical inactivity among teenage girls and disadvantaged populations, particularly women from lower socio-economic and minority groups, such as indigenous, African American and Hispanic women. Socio-cultural factors also influence attitudes and the level of engagement in physical activity. For example, to some cultural groups, physical activity means losing weight in order to attract men, therefore, those without such intentions or within normal weight limits may not have positive attitudes toward physical activity. Yet, the protective effect of physical activity appears to be greater in women than in men.

1.4.1.9 Alcohol intake

Heavy alcohol consumption is the third leading cause of death for women between the ages of 35 and 55 years. Those who consume three or more drinks per day are at risk of developing health problems, such as high blood pressure, stroke and CHD. Adverse effects related to alcohol manifest earlier in women, after 13 years of alcohol consumption versus 22 years for men. However, the protective effect against cardiovascular disease of regular alcoholic drinks, three or more times a week, have been documented, particularly in women.

Some risk factors for developing CHD that are not modifiable include age, genetic susceptibility and menopausal status. These risk factors and their significance in developing CHD in women are described below.

1.4.1.10 Genetic factors and ethnicity

Early family history of CHD or stroke increases a person’s risk of developing CVD, although it is considered a greater risk factor for men than for women. The
family history is considered positive if clinical CHD or sudden death is documented in a first-degree male relative before the age of 55 years, or in a first-degree female relative before the age of 65 years. The relative CHD risk in women increases by 2.8 times if there is a history of early MI in one parent.

Race and ethnicity are also contributing factors. The prevalence of CHD and magnitude of the associated risk factors vary across different ethnic and racial groups. For example, African American and South Asian women have a greater risk of CHD and stroke than white women.

### 1.4.1.11 Age and menopausal status

The absolute risk of CHD increases with age as the result of progressive accumulation of coronary atherosclerosis associated with ageing. The effect of ageing on CHD risk in women may partly relate to the menopause. Premenopausal women display a much lower incidence of CHD compared with age-matched men while the incidence of CHD among women increases rapidly after menopause. In a study by Leon et al., women who experienced early menopause as a result of bilateral oophorectomy were 2.2 times more likely to develop CHD than premenopausal women of the same age. It remains unclear, however, whether the influence of menopause on CHD is related to changes in oestrogen levels, or to the other risk factors, such as hypertension which is also related to age.

Understanding the concept and contribution of these risk factors has constituted a major advance for the development of CHD prevention strategies. The efficacy of early recognition and modification of risk factors has been well documented in prevention of CHD and reduction of the consequences of the disease. Yet, socio-
cultural differences in perception of these risk factors and practice of risk reducing behaviours appear to be important in CHD prevention.\textsuperscript{95-97}

\section*{1.6 Primary, secondary and tertiary CHD prevention}

Advanced technology has made it possible to identify CHD in its earliest stages.\textsuperscript{98} This has changed the classification of patients from “have or have not” to a continuum of cardiovascular disease, from latent to manifest. Clinical evidence of atherosclerotic disease significantly increases the risk for recurrent cardiac events, thus underscoring the importance of primary prevention measures. Some risk factors can be modified or eliminated by implementing lifestyle changes, such as increased physical activity or appropriate therapeutic interventions including control and treatment of high blood cholesterol.\textsuperscript{68, 98}

This has also led to a distinction between primary, secondary and tertiary prevention of cardiovascular disease. Primary prevention generally aims to modify risk factors or prevent their development, with the goal of delaying or preventing CHD onset.\textsuperscript{50} Secondary prevention aims to reduce recurrent events and decrease coronary mortality in patients with established CHD.\textsuperscript{68} Finally, tertiary prevention involves aggressive treatment and rehabilitation strategies to encumber or slow disease progression and decrease the adverse consequences.\textsuperscript{99} During the past half-century, many epidemiological studies have consistently documented the effectiveness of prevention measures in reducing mortality and morbidity associated with CHD in both men and women.\textsuperscript{68, 100, 101} For example, the INTERHEART study\textsuperscript{5} showed that three-quarters of the risk of CHD and stroke can be prevented in women. According to findings of this study, nearly two-thirds of women who die from a sudden cardiac event have no previously recognised symptoms,\textsuperscript{5} demonstrating the significance of
primary prevention programmes, early detection of risk factors and stratification of women on the basis of their CHD risk, using a valid risk assessment tool.

1.6.1 CHD risk assessment

Risk assessment is defined generally as the process of evaluating the specific risk posed by exposure to a particular substance or hazard.\textsuperscript{102} Risk can be assessed both in absolute and relative terms. Absolute CHD risk refers to the percentage chance of an individual experiencing a cardiac event during a definite period of time\textsuperscript{68} while relative risk is the rate of the disease in exposed persons compared to unexposed people of the same age and sex.\textsuperscript{100, 103} The absolute risk of CHD in any individual is determined by an interplay of several risk factors. As the cumulative effects of multiple risk factors appears to be synergistic, assessment of CHD risk based on combined effect of risk factors is recommended.\textsuperscript{11} Depending on what risk factors are included for assessing the risk, different types and versions of CHD risk assessment tools have been developed, such as the Framingham Risk Scale, the Dundee Risk Disc, the Joint British Societies Coronary Risk Prediction Chart, New Zealand Risk Table and more recently the Non-Laboratory-Based Method. Yet, the majority of the risk assessment tools have been developed based on the Framingham data. The Framingham Heart Study began in 1948 with 5209 adult subjects in Framingham, Massachusetts.\textsuperscript{104} This study has enabled defining the accumulative nature of risk factors as well as the contribution of each risk factor to CHD incidence in a given period of time.\textsuperscript{68}

There is a lack of agreement on the best approach for assessing CHD risk.\textsuperscript{105, 106} Existing risk assessment tools only enable rough estimate of absolute risk and can not precisely calculate actual absolute risk.\textsuperscript{107} Some of these tools also enable
estimates of relative risk, such as the Framingham Risk Score. Some suggest that both types of relative and absolute CHD risk should be assessed when designing risk reduction interventions for tertiary prevention, such as treatment of hyperlipidemia. However, Wilson argued that relative risk estimates may be more useful than absolute risk estimates in the elderly.

Risk assessment tools have successfully been used in designing cost effective population-based prevention interventions to reduce the burden of disease in high risk populations. These CHD risk assessment tools are also useful and simple enough to be used in clinical settings. They can assist health professionals in communicating CHD risk with their clients effectively to improve their perception of personal CHD risk which, in turn, facilitate engaging in risk reducing behaviours. Yet, communication of risk requires great care and caution. A Cochrane review which compared the effectiveness of different ways of presenting risk information reports that compared to general risk communication, personalised communication interventions, such as presenting individualised risk score or discussing patients personal CVD risk factors, have been related with improved cognitive outcomes, such as increased knowledge, improved accuracy of risk perception and increased uptake of primary and secondary CVD prevention programmes. Personalized risk information can be provided either written, verbally or visually.

Risk assessment tools have enabled stratifying individuals into risk categories from scientific perspective and appeared to be scientifically logical, objective and valid. In practice, however, there are substantial difficulties from lay people in making logical decisions to reduce their personal risk. It is well documented that people do not necessarily implement or maintain recommended changes in their risk behaviours. In fact, behaviour is not determined by an objective reality or by a reality as seen by
others, rather it is formed by an individual's beliefs and perceptions of the reality. Risks are commonly understood in a different way by different groups in society, implicating that health professionals should respect the insights of their clients. For example, Gore found that African American women were satisfied with their weight, although they were overweight compared to standard definition of ideal weight. These socio-culturally formed perceptions may influence weight loss goals in this population group.

The success of any preventive programme in changing risk behaviours is, however, subject to public awareness of the existence of these programmes, and their willingness to use the services. For example, self-perceptions of personal risk has been associated with attendance at cardiac rehabilitation. This underscores the importance of considering both absolute risk of CHD and individuals' perception of their personal risk.

1.6.2 Cardiac rehabilitation: A key secondary prevention strategy

After discharge from hospital, people often have considerable problems in resuming normal activities, such as leisure activities and sexual functions as well as changing their risk behaviours. This issue is becoming increasingly important, as more people survive acute cardiac events. Addressing the need to reduce the burden of CHD and improve outcomes, the World Health Organization (WHO) recommended cardiac rehabilitation (CR) as a secondary prevention strategy, and provided the following definition:

"The rehabilitation of cardiac patients is the sum of activities required to influence favourably the underlying cause of the disease, as well as the best possible physical, mental, and social
Cardiac rehabilitation aims to maximise physical, psychological and social functioning and to encourage behaviours that may minimise the risk of further cardiac events. The scope of CR has increased to include not only patients with a diagnosis of heart disease, but those identified at high risk of developing cardiovascular events. The efficacy and safety of CR programmes have been well confirmed in the literature. Benefits include improvements in risk factor profile, reduced risk of recurrent events and improved cognitive function. Cardiac rehabilitation also decreases the symptoms of angina and dyspnoea and improves psychological distress among patients following a cardiac event, resulting in improved quality of life. CR has been associated with reduced mortality and higher rates of survival at 5 and 10 years post-cardiac event. A meta-analysis of 32 randomised controlled trials, including approximately 4500 patients with coronary heart disease showed a reduction in total cardiac mortality by 31% in exercise only CR groups and 26% in comprehensive CR groups. However, the study could not conclude whether exercise only or a comprehensive CR intervention was more beneficial. In addition, the population studied in this review was predominantly male, middle-aged and low-risk, and it was unclear whether diverse ethnic populations were included.

1.6.2.1 Women and cardiac rehabilitation

Because of the high prevalence of heart disease among women, a greater number of women live with heart disease and are eligible for CR. Yet, demographic and clinical characteristics of women and men are different at the start of programmes.
Women tend to be older than their male counterparts and have greater co-morbidities and reduced exercise capacity, which is a stronger predictor of death in women. Women describe symptoms differently, have poorer subjective perceptions of their general health, lower self efficacy, particularly for exercise and an higher incidence of psychological distress.\textsuperscript{40, 125} Furthermore, women tend to delay seeking help for acute cardiovascular events.\textsuperscript{126, 127} Yet, evidence indicates that women achieve comparable benefits in exercise capacity, quality of life and risk factor modification to men in CR.\textsuperscript{128, 129} Furthermore, King reported a greater improvement in functional capacity for women compared to men, although this study failed to demonstrate gender or age as consistent predictors for the degree of recovery.\textsuperscript{130} In another study, three-quarters of women had returned to household duties in 4 weeks, compared with one third of men.\textsuperscript{131} Yet, the generalisability of these findings is questionable for two reasons. First, women, particularly those from ethnic minority groups and diverse cultures are often underrepresented in most studies examining the outcomes of CR. Second, the data have not been analysed separately for men and women, or women.

\textbf{1.6.2.2 Challenges of current cardiac rehabilitation programmes}

Despite the increased availability of CR programmes and convincing evidence of their efficacy, there are suboptimal rates of referral to, and utilisation of out-patient CR programmes, particularly among women and those from diverse ethnic and cultural groups.\textsuperscript{18, 132, 133} Attendance rates range from approximately 10% to 30% among patients with MI, with even fewer patients completing the programmes.\textsuperscript{119, 134} Utilisation is even worse among women, with an estimation as low as 5% and 6%.\textsuperscript{135} The rationale for underutilisation can be outlined under the following categories.
Referral failure

A report on CR programmes in Queensland showed that only 29% of patients discharged from hospital with documented heart disease were referred to outpatient CR programmes while 59% of these patients were eligible for the service. Another analysis on data from the Hunter region in New South Wales, Australia, identified that only 39% of eligible patients were invited to outpatient CR programmes. Women are even less likely to be referred to CR than men. Reasons for referral failure may be that physicians ignore the significance of heart disease in women, feel that surgery and/or medication is sufficient to control the disease in women or believe that certain patients may not benefit from participating in CR programmes. Referral failure could also be simply due to physicians lacking awareness of existing CR programmes. Regardless of the reason, referral failure can lead to a missed opportunity for women to improve their CHD outcomes.

Attendance failure

Women are also less likely to attend and complete CR even when they are referred to the programme. Lack of support, transportation problems, lack of insurance coverage and financial considerations have frequently been reported as barriers to attendance. In addition, women usually look after other family members and give priority to their family needs. The lower attendance rates may also be partially due to a higher incidence of depression among women after a cardiac event. Presence of depression at the start of programmes has been reported as the main predictor of non-attendance. Depression has also been associated with poor adherence to a low fat diet and exercise. Other barriers include inaccurate causal attributions to modifiable risk factors, lack of access to programmes and inappropriateness of the programmes to certain population groups, such as older
women and those from diverse linguistic and cultural groups. For example, women may feel nervous and insecure in situations with men and strangers. It is also possible that these factors are accentuated in women who have migrated to cultures where there is a dissonance between their beliefs and that of the dominant culture. Cultural and religious considerations, such as an increased emphasis on modesty of women, may hinder participation of women in physical activity.

1.7 Cardiovascular health disparities

Socio-economic, gender, race and ethnic inequalities in cardiovascular disease are widening, with CVD increasingly associated with social disadvantage. The growing prevalence of CHD risk factors in lower socio-economic groups, such as smoking, inactivity, obesity and diabetes, may further widen the inequalities in the future. There is also evidence indicating that among people from diverse ethnic groups in Australia, those with lower socio-economic status and a non-English-speaking background are at higher risk of dying from CVD than general population. Despite improvements in CVD health, developed countries remain challenged by significant health inequalities in their minority and Indigenous groups, and addressing these disparities and reducing the gap is a national priority for health systems in these countries.

Reasons for inequities in health and service utilization are not well understood. Yet, contributing factors include: lower socio-economic status; discrimination in the delivery of health services; and the failure of health care organisations and programmes to provide culturally competent health care to diverse ethnic and cultural groups. These obstacles are exacerbated if there is a language barrier impairing use of mainstream services.
Further, the under-representation of minorities and diverse cultural groups in research has resulted in the design of interventions and strategies based on information representing Caucasian populations. Consequently, models designed to prevent CHD in minority populations are limited. Developing culturally and linguistically appropriate health promotion goals and interventions requires active participation of the target community members in the design, implementation and evaluation of interventions. It is crucial to understand how diverse populations view and experience illness, and how they value risk reducing behaviours. It is also important to understand cultural variation in diet, lifestyle, spiritual beliefs, health beliefs, health experiences, immigration, discrimination, racism, poverty and lack of education, and how these factors may impact on the health status of diverse population groups, as well as the use and trust of health care systems. This approach can be facilitated via ethnography and other qualitative research methods.

1.7.1 Influence of culture on cardiovascular health

The terms culture and ethnicity refer to combinations of socio-economic, religious and political qualities of human groups, including language, diet, dress, customs, kinship systems and historical or territorial identity. Conceptualisation of illness and health, help-seeking behaviour and a willingness to comply with medical advice are all reflections of an individual’s cultural beliefs, values and experiences. These beliefs and values influence the receptivity and the capacity to change health related behaviours. Further, attitudes toward many CHD risk factors, such as diet, physical activity and obesity, which are central to the prevention of CVD and also to management and control of other CHD risk factors, including diabetes, hypertension and high blood cholesterol, are embedded in cultural beliefs and practices.
impact of culture on an individual’s health can be either positive or negative.\textsuperscript{14} For instance, a belief in fatalism is strong in some cultures including the Middle East. These beliefs influence attitudes and practices toward diseases. These beliefs may lead the individuals to take a passive role in their health.\textsuperscript{152} On the other hand, using the health care-facilitative strengths of cultures, such as the important role of families in supporting an ill family member in Middle Eastern culture and including families in health-promotion programmes may improve health outcomes, such as facilitating attendance at CR.\textsuperscript{153} The important role of culture in the perception of CHD and its influence on health outcomes will be further discussed in Chapter Two.

\textbf{1.7.2 Impact of immigration and acculturation on CHD risk factors}

Australia is a culturally and linguistically diverse country, distinguished by demographic, socio-economic and cultural and language differences. According to the 2001 Census, Australians come from over 200 countries.\textsuperscript{154} Figure 1.5 illustrates the status of migration in Australia between the years 1947 and 1998.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure1.5.png}
\caption{Settler arrivals by region of last residence, Australia 1947 to 1999}
\end{figure}

Without doubt, each of these groups are has its own intra-cultural diversity, and delivering health care to diverse populations renders major challenges to the health systems of multicultural countries.\textsuperscript{15} The appreciation of diversity in health beliefs and health seeking behaviours, and a necessity for cultural competence in service delivery become increasingly important as the management of chronic diseases in community settings gains more emphasis.\textsuperscript{15, 155}

Immigrants bring with them different lifestyle, cultural, social and genetic backgrounds. Furthermore, regardless of the reason for the migration, factors, such as age at the time of arrival to a new country, access to health services and the kind of social support they receive, affect the mental and physical health of immigrants.\textsuperscript{156-158}

However, the impact of immigration on the development of CHD remains uncertain, as the assessment of these associations become more complex when confounding factors, such as acculturation are added. In a study conducted by Bhatnagar et al.\textsuperscript{159} risk factors for CHD were compared in a randomly selected group of 247 immigrants from the Indian subcontinent of Punjab who were living in London, with their 117 counterpart siblings living in Punjab. Results of the study showed that Indians in London had an increased risk of developing CHD because of a higher body mass index, plasma cholesterol, fasting blood glucose levels, lower HDL cholesterol level and reduced insulin sensitivity in comparison with their siblings.

Overall, immigrants to Australia demonstrate better CHD health than their siblings in original countries.\textsuperscript{160, 161} However, length of residence seems to be associated with CHD risk in immigrants. The lifestyles and health needs of immigrants residing longer in Australia are more likely to change due to acculturation, and they may develop the disease patterns of the host country.\textsuperscript{13, 161} For example, there was an association between the length of residence of Vietnamese women in Australia and
increased body weight, dietary changes and total blood cholesterol. A similar study examined the impact of acculturation on CHD risk factors among elderly Koreans in Australia. Again, the results showed that women who had lived in Australia for more than 5 years had a greater BMI and significantly more CHD risk factors than women who had resided less than 5 years. To date, there are few cross-country studies investigating the impact of immigration on CHD risk factors in Middle Eastern women.

Even though by using siblings and relatives genetic bias was remarkably reduced in the above studies, “healthy immigrant effect” should also be considered. Further, the studies did not control for the socio-economic status of participants, which has been reported to have an important role in cardiovascular health. Environmental interactions need further investigations in diverse ethno-cultural populations, so that interventions for CHD prevention are preferentially tailored.

1.7.3 Imperative for cultural competence

Despite the Australian Government commitment to achieving better health outcomes for all Australians, significant disparities exist in terms of access to care, processes of care and health outcomes. The sources of these disparities are complex and multi-faceted. Some contributing factors include patient and provider attributes, socio-economic factors, access to services and health organisation policy. These inequalities are partially attributable to miscommunication between patients and health care providers. Cultural and linguistic barriers have long been problems in establishing an effective therapeutic alliance between patients and therapists from different cultural, ethnic and racial backgrounds, leading to misunderstanding and distrust. A barrier to receiving health services among American Indians was
reported to be a lack of trust and comfort with medical providers\textsuperscript{150} while South Asians identified language as a key barrier to accessing health services.\textsuperscript{166}

The importance of cultural competence in providing care has been the subject of much debate over the last few decades and some studies have reported the success of culturally competent programmes in increasing patient satisfaction and improving health outcomes.\textsuperscript{167} An integrative review of 14 studies including randomised controlled trials, controlled trials and uncontrolled studies with a pre-test post-test design concluded that culturally sensitive interventions significantly improved health outcomes with regard to diabetes, drug addiction and sexually transmitted diseases. However, this review has been criticised for some methodological weaknesses. For instance, the review failed to report any overall findings, as the studies were not synthesised and only the results of the individual studies were tabulated.\textsuperscript{168}

Yet, it is only in recent times that the important role of culture has been considered in the development of CHD, interpretation of symptoms, health-seeking behaviours in prevention and CHD outcomes. For example, Webster et al.\textsuperscript{153} found that the needs and disease experiences of Gujarati Hindu patients after a cardiac event were different from those of non-Asians. They also reported the influential role of culture on disease behaviours of the participants, such as attributing their heart disease to fate and destiny and taking a passive role in secondary prevention initiatives. This study also underscored the critical influence that culture may have in determining health seeking behaviours and responding to risk factor modification strategies.\textsuperscript{153} The authors suggested that understanding these key concepts could assist health professionals in recognising potential barriers in order to tailor interventions that best suit needs of diverse cultural groups.\textsuperscript{153}
A need for consideration of cultural competency in service delivery to patients with heart failure has also been increasingly addressed. Davidson et al. sought to explore the health patterns, information needs and health seeking behaviours in culturally diverse individuals with heart failure. The study recommended implementing culturally competent care in the management of heart failure, particularly among women and proposed tailoring existing models of heart care to ensure acceptability by various cultural and ethnic groups.

1.7.4 Culturally competent health services

Cultural and linguistic competence refers to the ability of providers and health care organisations to understand and effectively respond to the cultural and linguistic needs of clients in the health care encounter. Cultural competency includes a broader appreciation of cultural values, health seeking beliefs and practices of diverse cultural groups. Goode & Jones posit that culturally competent health system should acknowledge the following: 1) beliefs, values, traditions and practices of individuals and families within their cultural context; 2) culturally-defined strengths and needs related to the health of individuals, families and communities; 3) culturally-based belief systems of causal attribution, beliefs about healing and well-being and 4) attitudes toward seeking help from primary care providers.

It is also suggested that the health care providers be aware of their own beliefs and attitudes toward racial and ethnic minorities in order to avoid imposing these feelings on their patients. Additionally, providers need to understand and be aware of the worldviews of their patient without judgement and must be able to apply culturally competent skills when providing health services to culturally or ethnically diverse patients.
1.8 Rationale for addressing CHD risk in Middle Eastern women

Greater Western Sydney is a rapidly growing area of metropolitan Sydney, Australia. Health professionals in these regions struggle to ensure that health care services are appropriate and accessible to people from culturally and linguistically diverse backgrounds. In some areas, the numbers of people who were not born in Australia can be as high as 60.3%, with 65% speaking language other than English at home.\textsuperscript{174}

As part of clinical service development, the researcher worked with a team to address the needs of Arab, Turkish and Iranian women who were not accessing and using cardiac rehabilitation programmes in the local area health service. Two important factors that influence risk perception are gender and world views.\textsuperscript{113} Adult Middle Eastern women are, on average, more disadvantaged economically, politically and socially.\textsuperscript{175} They potentially experience a range of social factors, such as a lower health literacy, educational attainment and socio-economic status which may limit their capacity to access appropriate health services.\textsuperscript{175} Cultural barriers may also impede engaging in risk reducing behaviours in Middle Eastern women.\textsuperscript{87} Middle Eastern immigrant women come with a vast body of beliefs, attitudes, customs and practices that have their cultural roots enriched in historical foundations which are sometimes difficult to change. They remain associated primarily with their family roles within patriarchal social structures, with varying degrees across the countries of the region.\textsuperscript{175} Within Middle-Eastern society, women’s roles are strongly determined by a culture where there is a strong emphasis on the family system and collectivism.\textsuperscript{176,177} Migration in itself, whether forced or voluntary, can also have an adverse impact on health, potentially aggravating imprecise perceptions of the risk of heart disease.\textsuperscript{158} These factors individually and collectively may affect Middle
Eastern women’s risk perception and risk reducing behaviours in relation to cardiovascular disease.

Available data from Middle Eastern countries demonstrate a high prevalence of CHD risk factors among women. Yet, there is currently very little data on the awareness of these women of their personal CHD risk and their knowledge of existence of primary and secondary cardiac prevention programmes in Australia and those factors facilitating or impeding their use of such services. This is partially due to inherent difficulties in conducting research in minorities. Understanding these women’s perception of CHD risk and their risk reducing behaviours can assist healthcare professionals in modifying interventions to better match the needs of this particular ethnic minority group.

1.9 Conclusion

Despite significant improvements in mortality and morbidity, disparities in health outcomes for heart disease and stroke exist among disadvantaged populations, particularly women from lower socio-economic groups and diverse ethnic and cultural backgrounds. While primary, secondary and tertiary prevention programmes indisputably reduce the burden of CVD and increase quality of life, they are underused, particularly by women and ethnic minorities.

The increasing evidence of inequity in health outcomes suggests that CHD must be considered seriously among women and gender-based differences must be taken into account in the prevention, diagnosis and management of this condition. Furthermore, an individual’s perceptions, decisions and self-care practices play an important role in reducing the risk. Delivery of CHD health care within a framework of cultural competence is more likely to improve health outcomes. This study is important, as it
addresses an issue of concern to the local community in Western Sydney, within a socio-cultural framework, as well as having important implications for informing models of health intervention. The following chapter describes the development of a conceptual model used to inform the study design, implementation and interpretation of study data.
Chapter Two

Risk Perception
2.0 Introduction

As discussed in Chapter One, regardless of advances in assessing CHD risk, risk factor modification, which primarily involves behaviour change, is a complex and multi-faceted phenomenon. Pivotal to modifying risk reducing behaviours is the accurate perception of risk. Risk perceptions are based on information that people receive about a health threat. The individuals then form their values and beliefs based on past experiences and support that their received from reliable resources such as health professionals and the media as well as from family, friends and colleagues. This means that health beliefs and values are deeply embedded within personal, cultural, and social beliefs and norms. These factors also influence attributions that people make to discomforting symptoms and disease, including CHD. Understanding people within the context of their socio-cultural believes and values, and the impact of these factors upon the individual’s capacity to accurately perceive their risk and balance the negative and positive aspects of changing their behaviours can assist health professionals in their clinical practice and inform interventions and have capacity to improve health outcomes. The existing disparities in cardiovascular health as outlined in Chapter One suggests the need for developing socio-cultural models that are tailored to the needs of individuals, and in particular address factors impacting on minorities and diverse cultural groups risk perception and practices. Developing such models requires gaining further insight into targeted groups to develop theoretically derived frameworks that address behaviour change among culturally diverse populations.

Increasingly, researchers are resuming interest in understanding the perception of risk, particularly among diverse cultural groups, mainly because of evidence showing that by influencing individuals’ perceptions and beliefs about a given risk,
health professionals can increase the chance of people adopting healthier lifestyles.\textsuperscript{33}

\textsuperscript{187, 188} In this chapter, the theoretical models which have considered the perception of risk as a key component of behaviour change are discussed, and the contributing factors in shaping risk perception identified, as derived from the literature. Further, the literature on the perception of personal risk of developing CHD is presented. This includes how people understand heart disease and the attributions that they place on the disease. Further, the lack of congruence between perceived and absolute CHD risk is addressed and the implications for health service delivery explained.

2.1 Theoretical models

In spite of the importance of addressing behaviour change in modulating health outcomes, health and risk behaviours are poorly understood and there is evidence of the poor congruence between knowledge and consequential behaviours.\textsuperscript{189, 190} For example, many people confronted by warning messages and graphic images of the adverse effects of smoking and being aware of potential consequences of smoking, continue with this behaviour.\textsuperscript{58} A growing trend in management of chronic disease shows that knowledge alone does not necessarily translate to behaviour change, and many other factors, including perception of risk should also be considered.\textsuperscript{191}

Appreciating the nature of risk perception is important in considering theoretical perspectives. Gore\textsuperscript{114} describes “perception” as a process through which an individual organises, interprets, and transforms information from sensed data, providing meaning to the individuals experiences, reflecting the individual’s image of reality, and as a consequence influencing behaviour. Risk perceptions are subjective judgments and evaluations represent potential hazards.\textsuperscript{192} Davison et al.\textsuperscript{8} argue that the perception of susceptibility to risk influences individual’s reactions
and behaviours. Therefore, considering these perceptions against a socio-cultural
back-drop is likely to be advantageous. It also appears that individuals have a level of
risk with which they feel comfortable and adjust their behaviour according to this
level of perceived risk. Adams\textsuperscript{193} discusses this in the notion of a “risk thermostat” as
the collection of cultural filters, rewards, and costs which shape an individual’s
perception of susceptibility to risk. He believes that rewards such as food influences
an individual’s tendency to take risks. Adams also believes in “risk compensation”
and argues that people take risks because there is an enjoyment aspect to this. Adams
proposes that risk-reducing behaviours will be compensated by balancing
behaviours, for example, when somebody uses a seat belt, they tend to drive faster
until their internalised measure of risk returns to the preferred level. He also suggests
that if a person underestimates probability of a particular risk, they may tend to take
behaviours that bring more rewards than is actually justified by the real level of risk
posed.\textsuperscript{193} Adams’ risk thermostat model is illustrated in Figure 2.1.

\textbf{Figure 2.1} \textbf{Adams' idea about risk thermostat}

Studies on risk perception have been emerging since the 1970s and mainly focusing on environmental threats. Risk studies are steadily being expanded upon to assess and communicate the risk of certain diseases, including cardiovascular disease.\textsuperscript{113} Therefore, theoretical models specific to risk perception such as the Psychometric Model of Risk Perception and Cultural Theory have been developed based on environmental threats such as nuclear field, chemical exposure, and motor vehicle accidents. Further, the existing models on risk perception have been able to explain only small fraction of the perceived risk.\textsuperscript{194} Nevertheless, risk perception have widely been studied in light of many behaviour change models such as the Health Belief Model,\textsuperscript{183} the Social Learning/Social Cognitive Theory,\textsuperscript{195} the Extended Parallel Process Model,\textsuperscript{196} the Theory of Planned Behavior,\textsuperscript{197} the Trans theoretical Model\textsuperscript{198} and Leventhal’s Parallel Process Model and Self-regulatory Model of Health and Illness.\textsuperscript{199, 200} Adverse consequences of unhealthy lifestyles are manifested in conditions such as CVD, diabetes and cancer. Accordingly many health researchers are becoming interested in adopting and applying behaviour change models to better understand those factors associated with maximizing healthy behaviours.\textsuperscript{201}

The conceptual model derived to guide this study (see Figure 2.5) has adopted elements of the Health Belief Model, Leventhal’s Parallel Process Model and Self-regulatory Model of Health and Illness, and the Extended Parallel Process Model. Following an extensive literature review these theoretical models were chosen as they specifically focus on risk perception as a key element in behaviour change.\textsuperscript{185, 202, 203} Although this eclectic approach can be criticised, adopting a hybrid approach is likely to advance the limitations in the literature describing the impact of risk
perception on adopting favourable behaviour change. Elements of these models are discussed below.

### 2.1.1 The Health Belief Model (HBM)

The Health Belief Model was originally developed by Rosenstock\textsuperscript{204} as a method to explain and predict individuals’ health behaviours, and has been subsequently revised to include illness role behaviours.\textsuperscript{205} The fundamental components of the HBM are the individual’s perceived susceptibility to and the severity of a given disease, their perception of the barriers and benefits to reduce the risk,\textsuperscript{204} and recently added components, including cues to action and self-efficacy.\textsuperscript{205}

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**Figure 2.2 Health Belief Model**

The HBM states that the perception of risk is influenced by at least three factors:

- General health values;

- Beliefs about vulnerability to a particular health threat;

- Beliefs about the consequences of the given health problem.\textsuperscript{183}

Individuals have a unique perception of their likelihood of experiencing an adverse health event and these perceptions vary widely, underscoring the importance of assessing individual risk perceptions. At the lower end of the continuum, some may deny the possibility of confronting a given health threat; those in the mid-range may admit the statistical possibility of disease susceptibility; and at the other end of the continuum, some individuals may overestimate their risk of experiencing the health threat, raising concerns about the impact the disease may have on their life. Examples of these concerns include experiencing pain, financial burden, and difficulties with their role function.\textsuperscript{206} The Health Belief Model has been successfully applied and tested in a number of studies aimed at understanding patients’ compliance with recommended health messages relating to CHD, such as screening for hypertension or attending a cardiovascular secondary prevention programme. The findings of these studies have suggested perceived risk as an important factor predicting service utilisation.\textsuperscript{185,203} Understanding the individual’s values, perceived susceptibility, and potential outcomes appear to be important in improving the accuracy of risk perception.
2.1.2 Leventhal’s Parallel Process Model and Self-Regulatory Model of Health and Illness

Parallel Process Model, developed by Leventhal in 1970, considers that two parallel and interactive processes, including cognition and emotion, are active when confronting a health threat (see Figure 2.3). This model proposes that a cognitive representation of the health threat is a necessary condition to control emotion. These data led to the development of the Self-Regulatory Model of Health and Illness in 1987, which considers that the two parallel processes, cognition and emotion, influence causal attributions, labelling the symptoms, the perception of temporality and curability, and the ability to control events and the consequences of a particular condition. Internal and external factors, such as demographic attributes, health history, personality, culture, and social environment also influence an individual’s risk representation. These factors contribute to an individual’s capacity to cope with a health threat and take action to reduce the risk. Perceived control of illness and symptoms largely determines the individual’s appraisal changes.

Leventhal’s Self-Regulatory Model has been tested in a number of studies aiming to link peoples’ perception of risk and the actions taken to reduce their risk, such as attendance at CR. When facing a health threat such as a MI, a person forms a representation of a heart attack which guides their identification and utilisation of available services, such as seeking treatment in order to control the consequences. Nevertheless, studies have often examined the predictive role of only one or two components of the Leventhal’s Self-Regulatory Model, such as causal attributions and have not tested the model comprehensively. An important aspect of this model is considering the emotional response as well as cognitive recognition in risk
representation and also considering factors beyond the individual, such as social and environment elements which impact upon both cognitive and emotional processes.

Figure 2.3  Leventhal’s Parallel Process Model


The emotional processes initiate emotion related coping strategies to reduce stress, which are influenced by socio-cultural factors, such as belief in fatalism. Cognitive processes, on the other hand, initiate cognitive coping strategies, which help effective decision making and problem solving to manage the risk such as engaging in risk reducing behaviours.\(^{184}\) Without doubt, socio-cultural factors impact upon individual’s CHD risk representations, causal attributions, and their strategies to control the risk.\(^{8,87,97}\) Jayne et al.\(^{212}\) applied Leventhal’s Self-Regulation Model to Chinese immigrants with type 2 diabetes and found that the emotional process related to socio-cultural values about food and eating appeared to be more significant
than cognitive processes. To date, the predominance of either the cognitive or emotional processes of the Leventhal’s model in culturally and linguistically diverse groups has been poorly studied.

2.1.3 The Extended Parallel Process Model

The Extended Parallel Process Model (see Figure 2.4) developed by Witte in 1992 provides a valuable conceptual foundation for describing the predictive role of perception of risk in behaviour change. The model suggests that self-efficacy and response efficacy should be assessed in parallel with risk perception. According to this model, a high perception of risk along with low self-efficacy and/or low response efficacy may result in maladaptive responses. Self efficacy refers to ability to perform the recommended behaviour and response efficacy refers to effectiveness of the behaviour to reduce threat. For example, a person who perceives a higher risk of developing heart disease, but believes heart disease has solely a heredity basis and is not related to modifiable risk factors will likely perceive a low response efficacy from the modifiable risk factors and as a consequence may persist with these behaviours. According to Extended Parallel Process Model, the social environment also influences an individual’s health behaviour decisions. This model further considers perceived costs and benefits as the other factors affecting the likelihood of adopting health behaviours. From an individual’s point of view, if the costs outweigh the benefits, pre-existing behaviours are more likely to persist. This dialectical process undertaken by the individual is important in engaging in positive health-seeking behaviours. The Extended Parallel Process Model may have particular applicability to cross cultural populations, where extrinsic factors often play a greater role in risk perception. For example, in
Australian Aborigines, long-standing social disadvantage may fuel a lower self-efficacy and potential to change behaviour, as this may be perceived as futile.\textsuperscript{115}

\section*{2.3 Perception of risk of developing CHD}

Several studies have reported a positive association between the perception of a personal risk of developing CHD and taking preventive measures to reduce the risk such as adherence to low fat diet.\textsuperscript{139,214,215} Participants with higher perceived risk are more likely to think about CHD and seek information about the disease.\textsuperscript{215} When the vulnerability to cardiovascular disease is accurately perceived, people are also more likely to make changes to their risky behaviours.\textsuperscript{216} Perceived risk appears to influence early help-seeking behaviours for symptoms of heart disease, taking healthy lifestyle, attendance at CR and return to work.\textsuperscript{6,217,218} However, the relationship between risk perception and behaviour change is not linear, and

\begin{figure}
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\caption{The Extended Parallel Process Model}
\label{fig:extended_parallel_process_model}
\end{figure}

excessive risk perceptions may lead to fatalistic or avoidance behaviours. For example, Wilcox and Stefanick’s study failed to show an association between knowledge and perception of risk and practising of CHD health-promoting behaviours. Nevertheless, some argue that although risk perception does not necessarily affect changes in behaviour, acknowledging one’s personal perception of risk may be the first step toward CHD health promotion. The optimal level of risk perception leading to behaviour change remains unclear.

### 2.4 Misperception of personal CHD risk

Misperception of one’s personal CHD risk has consistently been reported, particularly among ethnic minorities and women. In a study, 57% of participants surveyed believed that they were at low or no risk of developing heart disease, yet, CHD is the most common cause of death worldwide and certainly individuals have some degree of risk of developing heart disease. In 2002, for example, CVD claimed the lives of 493,623 women compared with 268,503 lives from all forms of cancer in the United States. Further, Pilote and Hlatky reported that 73% of women estimated their risk of developing heart disease by age 70 years at less than 1%, with twice as many women reporting being worried about breast cancer (59%) than CVD (29%). A gender-based difference exists in the literature with respect to the perception of risk of developing CHD. Although women overestimate their risk in general, the findings of a number of studies show that women often underestimate their risk for developing CHD. In a study conducted by Moran et al., women had 1.4 times lower estimates of personal CHD risk compared to men. Gender-based differences have also been reported in perceptions of the severity of heart disease. Nau et al. found that women’s perceived severity of their illness was the same as men, but when the clinical severity of the disease was
controlled for, women perceived their heart disease to be less severe than men. This may, in part, explain the delay in care-seeking for symptoms of heart disease and poor cardiovascular outcomes among women. However, in a study by Meischke et al., gender was not significantly associated with risk perception.

The results of studies conducted outside of the USA have also confirmed suboptimal rates of public awareness and the perceived risk of developing heart disease. An international study, including 5 European countries reported that only 45% of the public correctly identified heart disease as the leading cause of death in their country and in Australia, as little as 10% of women believed that cardiovascular disease is the first killer of women over 45 years. Researchers in Saudi Arabia and Turkey have also reported similar results. In a national study conducted by the American Heart Association, only 13% of women with an oversampling of ethnic minorities reported heart disease as their major health threat. Minority women also demonstrated less knowledge and awareness about their risk factors. In addition to issues related to accessibility to mainstream health care by minorities, socio cultural factors are also important factor influencing perception of risk. Perceived venerability to risk, management of CHD risk, and attitudes toward obesity, diet, physical activity are deeply rooted in cultural values and practices.

2.5 Why do people underestimate their CHD risk?

The theoretical underpinning for underestimating CHD risk is not yet clearly defined. The noteworthy underestimation of risk among women may be due in part to a slowly-changing historical attitude to heart disease. From the 1950s to mid-1960s, the mass media focused on educating women to better care for their husbands’ hearts and from the mid-1960s to the 1970s, the information focused on CVD prevention,
but again mainly targeting men.\textsuperscript{228} In addition, historically women’s health issues have focused on reproductive health, misleading women to not pay serious attention to heart disease as their major health threat.\textsuperscript{52} Limited knowledge and awareness of the burden of CHD in women and an inaccurate perception of personal CHD risk and risk factors also contribute to underestimating risk.\textsuperscript{118, 229, 230} For example, more women in the USA identify high cholesterol as a CHD risk factor probably because of national efforts to increase the public awareness about the importance of identification and treatment of high cholesterol.\textsuperscript{231} In contrast, Australians are reported to be more likely to attribute causation to smoking, potentially because of the significant anti-smoking campaigns.\textsuperscript{232}

The underestimation of CHD risk by cardiac patients may be partially justified by the minimisation effect.\textsuperscript{233} Minimisation of risk, which has also been referred to as denial of implication, is one of the many strategies that individuals use to cope with a health threat. Individuals usually play down their risk of harm in order to avoid distressing thoughts and feelings.\textsuperscript{233} Minimisation effects have been reported following unfavourable results from health screening. Croyle et al.\textsuperscript{233, 234} conducted several studies to assess individuals’ reaction, judgement, and behaviour towards medical test results. Their studies showed that the participants with positive test results for an enzyme deficiency judged it as a less serious threat than those whose test result was negative. Similar findings were reported from cholesterol test results, with subjects with borderline-high level of blood cholesterol tending to underestimate the significance of high cholesterol, and appraising the test as less accurate than those with desirable readings.\textsuperscript{233, 234}
In an attempt to explain the rationale for underestimation of risk, Weinstein\textsuperscript{216} has developed the concept of optimistic bias, which proposes that most people optimistically underestimate their risk of a range of adverse events, including illness, as an attempt to seek the most comforting view of their own personal vulnerability. O’Brein et al.\textsuperscript{235} found that optimistic participants reported a lower perception of risk of susceptibility to hypertension compared to non-optimists, but found no difference in self-reported health behaviours related to hypertension between optimists and non-optimists. In this study, the researchers did not look at the participants’ objective risk of hypertension and relied totally on the participants self reports. The study could not conclude whether the optimistic participants underestimated their risk for developing hypertension, overestimated their health behaviours, or indeed were not at high risk of developing high blood pressure.

### 2.6 Factors influencing the perception of CHD risk

The perception of risk is a complex interplay of physical, psychological, social and environmental factors.\textsuperscript{236} A number of studies have attempted to explain the concept of risk perception for different diseases and health threats in order to better understand factors associated with preventive health behaviours, early health seeking behaviours as well as behaviour change.\textsuperscript{237,238} Research into the impact of demographics, risk factor profile and environmental factors on risk perception has been inconclusive and the literature on the perception of risk and associated factors has shown mixed results.\textsuperscript{46,111,219,229} The inconsistent or sometimes ambiguous results are likely partially due the inherent difficulties experienced in measuring subjective concepts.\textsuperscript{216} In fact, there is no precise or clear definition of perception of risk and the measurement criteria in the literature. For example, in examining of the perception of risk of heart disease, instead of exploring one’s attitudes and beliefs
toward the personal CHD risk, some studies have reported only knowledge or awareness of the disease,\textsuperscript{229} which is considered to be only one of many factors influencing perception of risk, and what people \textit{know} might be quite different from what they \textit{believe}.\textsuperscript{216}

Thus, difficulties lie with the measurement/assessment of risk perception. In a study by Meischke et al.,\textsuperscript{111} only 26\% of the variation in the perceived risk of MI was explained. The low coefficient of determination in this study suggests there may be as yet unidentified factors better able to explain the variation in perception of CHD risk. The processes through which people develop a perception of risk are complex and multi-faceted. These perceptions are shaped over time, informed by personal experiences and social networks, and influenced by behavioural norms and media exposure.\textsuperscript{8, 194} Presented below are factors drawn from the literature that have been reported as having some degree of association with the perception of personal risk of developing CHD.

\subsection*{2.6.1 Age}

Studies mainly show a positive correlation between age and perception of personal CHD risk. The younger the person is, the greater the illusion of invulnerability they may have about CHD.\textsuperscript{52, 139, 219, 239} Nevertheless, when experiencing CHD, younger patients have a stronger perception that their disease will have negative effects on their daily life functions.\textsuperscript{218} Yet, in a study conducted by Wilcox et al.,\textsuperscript{219} older women also did not believe that with increasing age they were at greater risk of heart disease.\textsuperscript{219}
2.6.2 Gender

Although women generally tend to judge risks as higher than men, they are more likely to underestimate their CHD risk. This has highlighted the need for health professionals to develop gender-specific interventions about CHD risks for women. Accordingly, the importance of undertaking a gendered based approach to health as a strategy to address health inequalities is increasingly being underscored in the literature. Aside from considering the biological differences of women, the roles and functions of women are predominantly determined within a socio-cultural context and expressed through their held values and experiences, underscoring the importance of considering these factors in health interventions.

2.6.3 Knowledge

Only a modest correlation has been reported between the amount of information about risk and the ensuring perception of the risk. It appears that decisions to change behaviour are not determined by knowledge alone, but rather other factors, including emotions, personal values, social pressures, environmental barriers and economic considerations. This is also supported in a study conducted by Meischke et al., which failed to show an association between knowledge of MI and perceived risk of the disease. However, knowledge and awareness of burden of CHD appears to play a more important role in risk perception in women than men. Meischke et al. reported that women who answered incorrectly that heart disease was not the most common cause of death for women in the USA reported significantly lower personal perceived risk than women who answered this question correctly. Wilcox and Stefanick also reported that women who were aware of heart disease as the leading cause of death among women had higher personal risk perceptions than women who did not know this fact. Consistent with above studies,
in their review study, Moser et al.\textsuperscript{127} found that knowledge was a significant factor in perception of risk and care-seeking behaviours in women rather men. However, to what extent knowledge and perception of risk affect behaviours in women has not clearly been studied.

### 2.6.4 General health

There has been a negative correlation between perceived general health and perception of CHD risk.\textsuperscript{46, 230, 244} People who perceived themselves to be in generally poor health, felt themselves to be more vulnerable to any illness, including heart attack,\textsuperscript{244} while those with perceived good general health perceived lower risk of developing CHD.\textsuperscript{222, 239}

There is evidence indicating that participating in some form of positive behaviour change may lead people to underestimate their risk of a particular disease. For example, women who regularly exercised had a significantly lower perceived personal CHD risk than those who rarely exercised.\textsuperscript{244}

### 2.6.5 The number of risk factors

Many studies have reported a positive correlation between the number of CHD risk factors and one’s perception of risk.\textsuperscript{239, 245} This was particularly significant in younger ages.\textsuperscript{239} In a study conducted by Silagy et al.,\textsuperscript{245} the more CHD risk factors possessed by the participants, the more likely participants were to perceive a health risk attached to their behaviour and desired to improve their risk factors. However, Moran et al.’s study\textsuperscript{46} failed to show a significant difference between perception of the personal risk and having one or more risk factors other than family history.
2.6.6 The visibility of risk factors

The visibility of risk factors seems to be important in perception of risk, as people attribute greater importance to visible risk factors such as smoking, obesity and death of a relative or friend from CHD while they have difficulties in the perception of risk factors which are not visible, such as high blood pressure\textsuperscript{232,246} and high blood cholesterol.\textsuperscript{226}

2.6.7 Personal and family history of heart disease

A number of studies have reported that those with a history of heart disease were more likely to perceive themselves at increased risk of cardiac events.\textsuperscript{46,239,247} However, awareness of CVD as the leading cause of death or knowledge about risk factors did not differ between the participants with and without a history of heart disease.\textsuperscript{108,226,239} On the other hand, there is evidence suggesting that survivors of a cardiac event may feel that their condition is under control and do not necessarily perceive themselves to be at an increased risk.\textsuperscript{239}

There is also evidence that individuals with a family history of CHD perceive themselves at an increased risk of developing heart disease\textsuperscript{226} while those with a family history of breast cancer are more likely to underestimate their risk of CHD.\textsuperscript{239} The effect of family history was influenced by the age of participants, in that the perception of risk of the younger participants was more likely to be influenced by family history of a cardiovascular event.\textsuperscript{239}

2.6.8 Race, ethnicity and Culture

The perception of personal risk of CHD is also influenced by the individual’s race and ethnicity.\textsuperscript{52,239,248} African Americans and Indian Americans, for example, perceive themselves as at increased risk of developing heart disease because of their
race. Race and ethnicity also seem to influence the perception of controllability of the disease. In a cross sectional survey conducted in the UK, 64% of Indo Asians felt that God/fate controlled their health compared with 33.3% of white patients and 22.7% of African Caribbeans. Only 20.6% of Indo-Asian and 26.6% of white patients felt that control lay with them compared to 63.6% of African-Caribbeans. The survey also found that 50% of Indo-Asians perceived their heart failure as less severe compared with 19% of white patients.

Further, an individual’s perceptions of cardiovascular risks are socially constructed. Davison et al. believe that the perception of risk is not only dependent on individuals, but various inputs from mass media, family, friends, colleagues, and neighbours also influence one’s perception of risk. People tend to exaggerate or minimise risk according to the social, cultural, and moral acceptability of the underlying behaviours.

Therefore, the opinions, attitudes, and perspectives that individuals hold about their health and illness are personalised modifications of generalised systems passed on from the wider society. For example, while prevention is a key focus of health system in many developed countries, taking steps to prevent disease may be unfamiliar to people from developing or under-developed countries.

Limited level of knowledge and awareness, and misconceptions about CHD have been reported among Middle Eastern communities. Further, fatalism, animism and animatisms are concepts relevant to beliefs about health and illness in Middle East, which may adversely impact on Middle Eastern women’s perception of CHD risk and their attitudes toward risk reducing behaviours.
2.7 Perception of risk in risk reducing behaviours: A conceptual model

Although the existing approaches to risk perception and behaviour change have been influential in explaining risk reducing behaviours in individuals, they have been criticized for concentrating too much on individuals’ perceptions and understandings of risk and not addressing the influence of environment in these perceptions. It is argued that risks can not be understood only at the individual levels and independent of social, cultural, and economical contexts in which people experience the risks. Some social scientists further argue that risks can not be considered real outside their socio-cultural context. Models of risk perception and behaviour change have mainly developed and been tested in developed countries where people have higher personal independence, more options for making decisions and better access to health care. Presented in Figure 2.5 is a conceptual model drawn from the literature review illustrating the role of perception of CHD risk in risk reducing behaviours taking into account socio-cultural factors. This conceptual model is a hybrid approach, incorporating elements of the Health Belief Model (HBM), Leventhal’s Parallel Process Model and Self-Regulatory Model of Health and Illness, and the Extended Parallel Process Model and further takes into account factors influencing perception of risk, including objective and experiential as well as individual and socio-cultural. These perspectives are important in understanding CHD risk among Middle Eastern women where the emphasis is more focused on community norms and cohesion than individual.
Figure 2.5  Risk perception in risk reducing behaviours: A Socio-cultural conceptual model
According to the literature, some factors impacting on perception of the risk of CHD include age,\textsuperscript{111} gender,\textsuperscript{46} knowledge,\textsuperscript{219, 243} cultural beliefs and values,\textsuperscript{8, 251} psychological status,\textsuperscript{254} general health status,\textsuperscript{244} pre-existing heart disease,\textsuperscript{222, 244} family history of heart disease,\textsuperscript{255} the visibility of risk factors\textsuperscript{246} and the number of risk factors.\textsuperscript{245} Perception of risk\textsuperscript{8, 206, 246} along with self efficacy and response efficacy\textsuperscript{191, 195, 256} have been considered as internal resources and important determinants of health-related behaviour change. High level of perception of risk with low level of self efficacy and response efficacy have been related to rejection of a recommended health behaviour.\textsuperscript{196} Health messages, therefore, not only should stimulate an appropriate level of risk perception but also consider the individual’s perceptions of their capacity to take a recommended behaviour (self efficacy) as well as the efficacy of the recommend behaviour (response efficacy). The extent to which people are engaged in risk reducing behaviours is also influenced by external resources, both socio-cultural and instrumental, such as support that one receives from spouse and significant others and availability of appropriate health services.\textsuperscript{6, 257, 258} A final factor affecting the likelihood of adopting healthful behaviours is weighing the perceived barriers and benefits. Behaviour change is more likely to occur when the perceived benefits outweigh the perceived costs.\textsuperscript{183}

The conceptual model proposes that an accurate perception of susceptibility to CHD risk, belief in effectiveness of CHD risk reducing behaviours, and perceived higher self efficacy in relation to risk factor modification as well as a supportive socio-environment increase the likelihood of adopting a risk reducing behaviour. Bandura’s Social Cognitive Theory\textsuperscript{195} explains that there is a continual reciprocal interaction between the individual, environment, and their behaviours. As discussed earlier, self-efficacy refers to the individual’s ability to perform a behaviour or set of behaviours
to achieve a desired outcome.\textsuperscript{195} A range of factors impact on developing self-efficacy, including performance accomplishment, vicarious experience, verbal persuasion and physiological feedback.\textsuperscript{195} Further, a range of views of social support have been put forward. Social support can be emotional and/or instrumental.\textsuperscript{259} This means individuals modify their performance to fit the socio-cultural values, emphasising the importance of considering these factors in interaction.

The status of perceived personal risk of developing CVD in the literature is addressed which set the context to discuss about the applicability of the conceptual framework to improve cardiovascular health. This conceptual framework has informed the study design and interpretation of findings.

### 2.8 Lack of congruence between perceived and estimated absolute risk of CHD

Although optimally a person’s perceived risk of developing CHD should match their absolute risk, perceptions of risk do not often correlate with measurable probabilities of risk. A number of studies have reported the gap between the perceived and the estimated absolute risk of developing CHD and raised concerns about the underestimation of personal risk.\textsuperscript{52, 108, 139, 239} It is argued that dissociation between desires and reality may help people to better cope with circumstances, however, concern arises when it impedes risk-reducing behaviours.\textsuperscript{108} Minority women are more likely to underestimate their CHD risk. Christian et al.\textsuperscript{185} assessed the perception of CHD risk among ethnically diverse women and compared the results with their estimated risk on the basis of the Framingham global risk score. The study found that the risk of developing CHD in 10 years was less than 10\% in 59\% of the participants, between 10\% and 20\% in 20\% of the participants, and greater than 20\% in the remaining 21\% of participants. When compared with their perception of
personal risk of developing CHD, only 52% of those with low calculated risk correctly perceived their risk of CHD as low (<10%). The study concluded that most women in lower risk overestimated their risk. In contrast, young women who were at moderate or high risk underestimated their risk of developing CHD.\textsuperscript{185}

Further, Ferrario et al.\textsuperscript{260} compared participants’ perceived risks with an Italian reference chart, used for estimating absolute risk of CHD. A total of 877 individuals (382 males, 495 females) were asked to estimate the probability of experiencing a heart problem over 10 years. These results were then compared with the probability of developing a cardiac event based on their actual risk factors using the reference chart. Overall, 33.2% of participants perceived themselves as being at low risk, 22.2% at mild risk, 35.3% at moderate risk, 7.8% at high risk, and 1.5% at very high risk of coronary events. In this study, overall the 10-year CHD risk of the participants estimated from the reference chart was < 3% for 44.8%, from 3 to 4% for 17.9%, from 5 to 9% for 29.3%, from 10 to 19% for 7.2%, and ≥ 20% for 0.8% of the participants in this study. According to this reference chart, 41% of the participants overestimated their risk, 32% evaluated their risk correctly, and 27% underestimated their personal CHD risk. The important finding of this study was that some 94% of the participants with a 10-year CHD risk ≥ 10% underestimated their risk.\textsuperscript{260}

A lack of congruence has also been reported between perceived personal risk factors of CHD and participants’ actual risk factors.\textsuperscript{45, 232, 254} Murphy et al.\textsuperscript{232} found a considerable mismatch between Australian women participants’ perception of the underlying cause of their disease and their documented risk factors. Likewise, in a study in Saudi Arabia, only 15.7% of participants with high dietary fat intake
perceived their diet to be unhealthy while only 16.5% of overweight participants perceived their weight to be risky. Further, only 22.6% of physically inactive participants perceived their inactivity as harmful. Yet, being a heavy smoker, obese and having more risk factors were associated with higher perception of risky behaviours in the participants.\textsuperscript{179}

\section*{2.9 Causal attributions for coronary heart disease}

Public awareness and understanding of risk factors as the underlying cause of CHD has been the focus of a number of studies.\textsuperscript{232, 254, 261} In order to communicate CHD risk efficiently, it is important to understand the attributions that people place on their disease.\textsuperscript{143} A systematic review of literature on causal attributions for heart disease shows that chronic stress and lifestyle factors are common cited risk factors. Yet, people who attribute to lifestyle risk factors as the cause of their heart problem are more likely to make lifestyle changes and maintain these changes.\textsuperscript{143} Further, there is evidence that survivors of MI are more likely to attend CR if they attribute their disease to lifestyle factors.\textsuperscript{143} Billing et al.\textsuperscript{262} reported that patients’ causal attributions predicted change in lifestyle behaviours, subjective functioning during CR and the level of underlying CHD risk. In contrast, those who believed that their disease was due to non-modifiable risk factors, such as genetics, were less likely to see any point in making lifestyle change.\textsuperscript{263} The empirical research shows that women are more likely than men to attribute their illness to non-modifiable and external risk factors, such as heredity and stress.\textsuperscript{261, 264}

However, it seems that there has been a general increase in awareness of CHD risk factors in the USA According to a study conducted by Humphries and Krummel in 1999,\textsuperscript{265} marital status, obesity, low income and age were cited as CVD risk factors
by women. Recently, an integrative review of nurse-conducted studies on perception of CHD risk factors concluded that a diet high in saturated fat, lack of physical activity, family history of heart disease and high blood pressure were the risk factors commonly identified by women. Nonetheless, the study showed that women could not identify obesity, diabetes and smoking as CHD risk factors.²⁴⁹

There also appears to be a link between casual attributions that people make to their disease and culture. In some cultures, disease is believed to be a curse caused by others or it is because of one’s bad destiny.¹⁵⁰, ²⁵¹ The results of a qualitative study showed that most African-American youth believed that smoking was harmful to health. Yet, some younger women felt that cigars were more "natural" with no nicotine and therefore less harmful than cigarettes.²⁶⁶ Also, the emphasis on certain risk factors seems to vary among different cultural and ethnic groups, for example, Hispanic and Turkish participants put a lot of emphasis on stress as the fundamental cause of heart disease⁵², ⁸⁷ while some racial groups believe that family history of the disease, genetics, or affiliation with a particular ethnic group were the causes of heart disease or stroke.¹⁵⁰

2.10 CHD risk perception of health professionals

Health professionals frequently underestimate the risk of CHD in women with one study finding less than 1 in 5 physicians knowing that more women die of CVD each year than men.²⁶⁷ These misperceptions among health professionals may contribute to suboptimal preventive care and treatment received by women compared with men, and thus to the existing CHD health disparities. There is evidence that general practitioners do not often discuss CHD risk and risk factors with their female patients.⁴⁷, ¹³⁹
Further, health professionals do not often take into account patients’ perceptions of their personal risk, and presume that patients will perceive and understand their interpretation and advice.\textsuperscript{263, 267, 268} However, there is evidence that factors which seem to be significant to health professionals may not be important to patients.\textsuperscript{108, 260} Bjerrum et al.\textsuperscript{268} found that there was a disagreement between patients’ and health professionals’ perception of risk factors and overall CHD risk, mainly because of lower identified risk factors by doctors. However, the patients’ overall perception of their personal risk was lower than the doctors. The study concluded that health professionals either do not have comprehensive information about their patients’ lifestyle or they have different perceptions of the importance of specific risk factors.

Health professionals, therefore, may not be aware of these differences, as patients’ perceptions may not necessarily match their absolute risk, plus patients are generally reluctant to ask questions or discuss personal views of their illness in consultations.\textsuperscript{218, 269} The lack of effective communication may lead to a decreased awareness of personal CHD risk factors and ignorance of the significance of risk-reducing behaviours.\textsuperscript{139} Another study found that nurses’ perceptions of the patients’ CHD risk factors were influenced by epidemiological evidence on risk factors, such as lack of physical activity and unhealthy diet rather using a valid risk assessment tool.\textsuperscript{97}

\subsection*{2.11 Improving the accuracy of CHD risk perception}

Studies have reported the amenability of risk perceptions, and suggested that both primary and secondary prevention programmes should be designed to stimulate appropriate levels of risk perception while also considering the receivers’ beliefs about themselves and the recommended behaviour.\textsuperscript{188, 270} These interventions have
improved screening for breast cancer and vaccination. However, relatively few studies have examined the success of interventions in changing perceptions regarding CHD risk. While some interventions have failed to improve risk perception and health outcomes, others have successfully led to improving risk perception and outcomes such as attendance at CR.

However, a single educational session designed to improve attendance at CR through correcting misperceptions and improving illness perception of patients after MI failed to show any difference in attendance at CR between intervention and control groups. This shows how entrenched knowledge, attitudes and beliefs can be.

In contrast, a brief educational intervention was successful in changing perception of personal risk of developing heart disease in ethnically diverse women without heart disease (125 women) who were chosen from those who underwent mammography screening. Immediately after the educational intervention there was a significant increase in the proportion of women who correctly categorised their risk as low (67% in the intervention group vs. 52% in the control group). However, after one month, only 52% of participants in intervention group correctly perceived their risk as low. Further, among moderate and high risk women, with absolute risk equal and greater than 10%, there was a steady decline in the number of women who accurately perceived their risk (71%, 68%, and 64% respectively). Outcome measurement of this study was simply recalling the information and the question of whether interventions at this level could lead to behaviour change was not answered by this study.

The results of these studies indicate that a brief simple education is not enough to improve risk perception in long term. There are many factors other than education
and knowledge which are also important in risk perception and should also be included in designing interventions to improve perception of risk. Considering this perspective, Petrie et al.\(^7\) undertook a randomised controlled trial to examine an in-hospital intervention to change cardiac patients’ perceptions regarding their disease. The intervention group received the standard care plus three brief visits by a psychologist. The first visit focused on discussion of the causes of their MI, the second visit focused on what the patient could do to minimise future risk, and the third visit aimed to develop an action plan. At discharge, there was a significant difference between the intervention and control group in their beliefs about the consequences of their MI, controllability of the disease, and whether they could control the future course of their disease. The simple intervention also influenced return to work in that patients with strong feelings that cardiac disease did not have serious consequences and believed that their illness would not last too long were more likely to return to work.

### 2.12 Promising initiatives in promoting awareness of CHD risk

Trends in public awareness and knowledge of cardiovascular disease are increasing in the USA, and gradually more women know that heart disease is a serious health threat. According to the findings of a telephone survey of households in the USA in 1997, only 33% of the respondents identified heart disease as the leading cause of death and only 8% identified heart disease and stroke as their greatest health threat.\(^{273}\) Similarly, in 1998, only 9% of the USA women aged 45-64 years perceived heart disease as the most threatening health condition for themselves.\(^{273}\) In 1999, Wilcox and Stefanick\(^{219}\) reported that only 34% of older participants knew that heart disease is the leading cause of death in older women. Promisingly, women’s
awareness of heart disease as their leading cause of death is increasing, with 46% in 2003, 50% in 2005, and recently 57% of American women in 2006 being aware of heart disease as the major health threat for women.\textsuperscript{38,47} Further, increasingly more women discuss about heart disease and the associated risk factors with their family doctor. In a series of studies, Mosca et al. (2000 & 2004) reported that the percentage of women who reported they had never talked about heart disease with their physician decreased from 70% in 2000 to 62% in 2003.\textsuperscript{52,118} Without doubt, the national programmes directed specifically at women, such as “Wellness to Heart” or “Go Red for Women Movement” have contributed to this achievement in the USA.\textsuperscript{274} Yet, concerns remain as many women fail to use this information to formulate a judgment of their personal vulnerability to CHD. The percentage of women who perceived heart disease as their major health threat has increased steadily, with 7% in 1997 and 8% in 2000\% to 13% in 2004,\textsuperscript{47} implicating that interventions should focus on convincing people that they are at greater personal risk than they think, and should take a proactive role to protect their cardiovascular health.\textsuperscript{108}

\subsection*{2.13 Summary}

As risk factor modification has been shown to reduce the risk of CHD,\textsuperscript{275} attentions turn to understanding how to maximise primary and secondary service utilisation including CR. A particular concern for women is the lower attendance rates and poorer CHD health outcomes.\textsuperscript{76,137} The decision to reduce the risk for CHD and adopt a healthy life style is a complex issue influenced by not only personal but also many cultural and environmental factors. These factors influence risk-reducing behaviours by shaping individuals’ beliefs and perceptions of their personal risk for a particular health threat, such as CHD.\textsuperscript{8} In multicultural societies including Australia,
management of CHD in a culturally appropriate manner, therefore, remains a challenge for the health system. With the increasing evidence of gender and racial/ethnic disparities in CHD health in the Australian health system, and in light of data suggesting that a proportion of minorities have CHD risk factors, a more in-depth understanding of minority women’s perception of CHD risk and their risk reducing behaviours is needed to inform healthcare professionals, so that they can better help women prevent the development and progression of CHD. Certainly, minorities have unique health care needs, diverse perspectives, and valuable views to contribute. These differences must be taken into account if a considerable decrease in burden of cardiovascular disease is to happen in Australia and other similar countries such as the USA, Canada and Europe.

Although widely studied in white populations, models focusing on assessment, prevention, and management of CHD among minorities are limited. These populations are usually underrepresented in studies due to significant challenges encountered in research involving ethnic minority groups, including methodological challenges in instrumentation and study design, increased costs due to the need for interpreters and cross cultural materials and difficulties in recruitment.

There is limited evidence that individuals from Middle Eastern background accurately perceive their risks of disease, or whether interventions designed to change these perceptions have been successful. Through examining risk perception among women from Arab, Persian and Turkish cultural groups, the proposed study will contribute to the body of knowledge in terms of documenting the level and accuracy of perception of CHD risk and risk factors in Middle Eastern women, as a minority cultural group in Australia. Through using a mixed method study design
and involving participants with and without a diagnosis of CHD, this study is believed to yield rich information on beliefs and perceptions of CHD risk, risk factors and the risk reducing behaviours among Middle Eastern women.

Further, by comparing the participants’ perception of risk with their estimated absolute CHD risk, this study is believed to be able to investigate the accuracy of the risk perception and the congruency of perceived and estimated absolute risk among the study participants. It is possible that women from cultural minorities are disadvantaged in accessing mainstream services from both the perspective of culture and gender. The information obtained from this study will have significant implications for CR services to formulate culturally appropriate programmes, at both the primary and secondary prevention levels as well as providing critical data to power further intervention studies. The methodology will be explained in detail in the following chapters.

### 2.14 Conclusion

This chapter has provided a conceptual model to inform the study and discussed the perception of risk within models explaining behaviour change. The aim of this study has not been to test this conceptual model in relation to improving behaviour change but to explore the conceptual congruence of the proposed model. An important key to developing effective health interventions, particularly those that are culturally competent, is to tailor these to the needs of the target population, rather than the prevailing status quo and the needs of health providers. As such this study is descriptive and exploratory laying the foundations for conceptually congruent and culturally competent interventions.
A large and diverse body of literature exists in relation to risk perception and behaviour change, yet the consideration of gender and culture within a socio-cultural model has been poorly described. This chapter has summarised the literature on perception of risk of developing CHD among women. According to the literature, despite the promising trends in public awareness of heart disease in developed countries, individuals particularly those from minority groups and women do not accurately perceive the risk of heart disease. A wide gap exists between the estimated absolute risk of developing CHD and individuals’ perception of their personal risk. There is also mismatch between people’s attribution to their heart disease and their risk factor profile. There are likely system, provider and patient factors impacting on this situation. Further, the literature describes a mismatch between health professionals’ perceptions of their patients’ risk and what is perceived by patients. Despite the significance of perceived personal risk of developing CHD in risk reducing behaviours, research surrounding the issue has been sparse, particularly among diverse cultural populations. Further, the existing studies have yielded inconsistent or ambiguous results, partially because of the inherent difficulty in measuring subjective concepts. The following chapter will describe the methodological considerations in undertaking the study.
Chapter Three

Study Design and Methodology
3.0 Introduction

The previous chapters have discussed the importance of adopting a socio-cultural model for considering risk perception, particularly related to CHD. This chapter provides details of the overarching research design and methods. Discrete issues relating to Study One and Study Two are discussed in Chapter Four and Chapter Five respectively.

3.1 Study aim

The overarching aims of this study have been to address the following research questions:

1. In what way do Middle Eastern women perceive CHD risk and risk factors in general?
2. In what way do Middle Eastern women perceive their personal CHD risk and risk factors?
3. What behaviours do Middle Eastern women employ to reduce their risk for CHD?
4. What is the estimated absolute CHD risk of Middle Eastern women?
5. Is there congruence between estimated and perceived CHD risk and risk factors among Middle Eastern women?

3.2 Methodological approach

Over recent decades, it has evolved that in order to achieve an understanding of complex phenomena, undertaking a multi-faceted and multi-method approach can provide a deeper understanding and elucidate explanations.\textsuperscript{277} This stance challenges
traditional positivist paradigm, which assumes that objective reality exists independent of human observation. Traditionally, researchers have been described from a polarised perspective as being either quantitative or qualitative researchers.\(^{278}\)

\(^{279}\) Quantitative research is defined as a form of research in which the researcher is the means through which the study is conducted to learn about some aspects of the social world and qualitative as research conducted to test hypotheses through experiments, quasi-experiments, or correlations.\(^{277}\)

Both qualitative and quantitative approaches have been criticised for different limitations.\(^{280}\) When using quantitative methods, the researcher measures only variables defined important by the researcher, and may neglect many events that occur within the context of the setting. This is particularly important when dealing with a phenomenon where there is a paucity of research and no established theory.\(^{280}\) These questions are believed to be best answered with qualitative methods.\(^{281}\) Qualitative methods are appropriate when a study seeks to understand beliefs and attitudes of study population, such as the meanings that people attribute to their health experiences and behaviours.\(^{280, 281}\) Nevertheless, when using qualitative methods correlations and casual relationships between variables are missed.

Increasingly nursing and health care environments use and apply mixed methods approaches.\(^{282}\) The term “mixed methods” describes research which employs both qualitative and quantitative epistemological and methodological considerations in study design.\(^{283}\) In mixed methods neither the quantitative or qualitative dimension is considered to be superior, rather synergistic and complementary.\(^{283}\)

Mixed methods approaches are increasingly gaining recognition as a conceptually congruent and methodologically rigorous approach to reconcile the differences
between quantitative and qualitative approaches.\textsuperscript{277, 283} Methods can be combined simultaneously or sequentially: simultaneous mixed methods applies the qualitative and quantitative methods at the same time while in sequential mixed methods the findings of one method is expected to guide the next method.\textsuperscript{278} Therefore, mixed methods can take benefits of deferent methods, strengthening research results and contribute to theory and knowledge development. Mixed methods provide investigators a more comprehensive understanding of the phenomenon under study that might not be achieved using a single method.\textsuperscript{277, 283} There are significant advantages in adopting an approach that allows measurement and assessment as well as exploration in investigating complex phenomena, such as risk perception in a socio-cultural context.\textsuperscript{216} Weinstein,\textsuperscript{216} conducting a considerable research on risk perception, argues that understanding individuals’ risk perception should include beliefs and attitudes that are relevant to decisions and behaviours concerning that risk and a few questions can not determine a person’s understanding of the threat. Weinstein proposes that researchers must use a variety of questions as well as approaches to learn what people understand about a risk.\textsuperscript{216} The present study applied simultaneous mixed method approach to rich the complexity and psychometric notion of risk perception.\textsuperscript{236, 284}

### 3.3 Research design

The Middle-Eastern Women Study comprised two discrete, yet interrelated studies in a simultaneous mixed method study design.

- Study One explored the perception of CHD risk and risk factors among Middle Eastern women without heart disease, and compared these perceptions with the participants’ estimated absolute CHD.
• Study Two described the perception of CHD risk and risk factors among Middle Eastern women with heart disease, and compared these perceptions with the participants’ estimated absolute CHD risk.

3.4 Study setting for the Middle Eastern Women Study

3.4.1 Setting for Study One

As discussed in Chapter One, Australia is a culturally diverse country and in order to provide effective health care interventions it is important to consider how diverse cultural groups perceive and evaluate risks and how these perceptions impact on their capacity to engage in risk reducing behaviours. The Sydney West Area Health Service (SWAHS) provides health services to the most culturally diverse population in the New South Wales (NSW), Australia. In 2006, approximately 47% of new settlers under the Humanitarian Programme in NSW settled down in Sydney West. Three of the top five local government areas where settlement occurred were Auburn (19%), Blacktown (12%) and Parramatta (8%).174 The main health challenges of SWAHS include higher rate of lung cancer in men and myocardial infarction in women compared to New South Wales averages.174 The researcher has partnered with the Service of Clinical Excellence in Auburn285 in order to undertake a project to inform service delivery, particularly related to cardiology and prevention services in this region with a focus on developing an emerging CR program in Auburn. The community in the Auburn local government area consists of around 60,000 residents174 and is the second more socially disadvantaged suburb in the New South Wales.174 A large population of Arab, Turkish and Chinese immigrants live in this suburb and require specific type of support and access to health services.174 Through collaborations with community groups and service organisations, women were
recruited from the Auburn, Parramatta, Mount Druitt, and Bankstown areas because of the high representation of Middle Eastern Women.

3.4.2 Setting for Study Two

Women with heart disease were recruited from the cardiology wards in Auburn Hospital and Westmead Hospital in SWAHS in Sydney, Australia and Madani Heart Hospital in Tabriz, Iran. Auburn Hospital is an acute district hospital and challenges with the special needs of the diverse local population. Westmead Hospital is the largest teaching hospital and a major tertiary referral facility in Australia. Westmead Hospital leads the way in areas, such as cardiovascular disease. Madani Heart Hospital is the largest teaching cardiac hospital in the North West of Iran. Recruitment of participants from Iran enabled addressing of the impact of acculturation on the study participants’ risk factors, casual attributions and perception of the risk of heart disease.

3.5 Study population

The term “Middle East” pertains to a geographical regions, including countries such as Cyprus, Egypt, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, the United Arab Emirates, and the Palestinian Territories of the West Bank and the Gaza Strip. People from these regions are generally known as "Middle Eastern". Importantly, within the context of this study the term, Middle East, defines a cultural area, and as such does not have precise geographical borders. The term Middle East encompasses several sub-cultural and ethnic groups, such as Persian, Turkish, Arabic, Jewish, Assyrian and Kurdish, which share common cultural values due to geographical proximity, common history and shared religions, three important factors in shaping culture. These regions also share a history of racial unrest and
political turmoil. Although it is important to avoid stereotyping, having an understanding of knowledge, attitudes and health beliefs of cultural groups is important for health professionals. These beliefs may affect people’s attitudes toward prevention programs and influence their treatment seeking behaviours. For example, Meleis and Hatter-Pollard discuss that Arabs are more past and present-oriented than future-oriented and this may affect attitudes toward prevention measures (future-oriented) among this population. Many Arabs believe in God’s control over events rather than individual effort. As cardiovascular risk reduction requires future orientation and commonly self efficacy, it is important to examine such constructs to inform culturally competent health interventions.

Extracting these cultural beliefs and attitudes toward heart health is the main focus of this study. The study recruited women from Turkish, Persian and Arabic languages, three language groups covering a vast part of the Middle Eastern region, to take into account the sub cultural differences. Brief overviews of the ethnic groups, represented in this study, including cultural beliefs and how these impact on health behaviours, are provided below.

3.5.1 Arabic language and culture

Arabic is widely spoken by people in the Middle East. Arabs migrated to Australia primarily due to war, social disharmony or a wish for economic and professional improvements. Middle Eastern immigrants are mainly Muslim, yet regardless of their religion and original country, Arabs often share cultural aspects in their ways of living. They accept Western medicine and hospitals, but differences in values, understanding and presentation of the health concerns should be taken into account. In these groups, health professionals of the same gender and religion are
preferred. Arab immigrants, without the ability to communicate in English, are often isolated from mainstream services.\textsuperscript{288} Family and friends are a great source of support for patients.\textsuperscript{176} A male or the person seen as the wiser in the family may make the decision in the patient’s best interest, including health decisions.\textsuperscript{176} Some people have superstitious beliefs about cause of illness, such as the evil eye, God’s punishments for sins and the curse of the devil. The elderly and religious may endure illness in the belief that it is God’s will and he may cure the disease.\textsuperscript{288}

### 3.5.2 Turkish language and culture

Turkey is situated at the meeting place of Europe, Asia, the Middle East and Africa, and so frequently referred to as a crossroad in terms of geography, religion and culture.\textsuperscript{177} Turkish language, spoken in Turkey and by minorities in 35 other countries, has a high degree of mutual intelligibility with other languages, including Azeri.\textsuperscript{177} In Turkish culture, conformity is more valued than individualism. In fact, identity is usually determined by family membership, group or work associations. The norms or traditions of the group are enforced standards of behaviour that are expected of the members of the culture. Interdependence is encouraged and defined as a source of strength and support for people.\textsuperscript{177} Turkish people are more relationship-oriented and highly value friendships and networks.\textsuperscript{177} Turks accept Western medicine, but they may believe that their health is beyond their direct control.\textsuperscript{289}

### 3.5.3 Persian language and culture

Persian is spoken primarily in Iran and neighbouring countries. Iranians include several ethnic groups, mainly Persian, followed by Azerbaijani, with lesser numbers of other ethnic groups. The vast majority of people from Iran are Muslim. Persian is
the formal language of Iran, with some speaking Azeri, Kurdish, Luri, Balochi, and Arabic and so on. Western medicine is accepted by Iranians, however, screening is not practiced, so new immigrants may not be familiar with screening and preventive measures. Doctors usually do not disclose threatening diagnosis or prognosis to patients, as it is believed that patients would not be able to cope with their condition. These factors may influence patients’ awareness of their personal risk and practice of risk reducing behaviours. Patients are expected to take rest and the family will provide support to an ill person. Normally, the patient decides type of treatment, however, families sometimes make these decisions.

Outlined above are main characteristics of Arab, Turkish and Persian cultures in relation to health, illness beliefs and behaviours. Insights into these cultural beliefs and attitudes could provide a clear understanding of the target groups’ health values, the family decision maker regarding health and illness and what are the barriers for practicing health behaviours in diverse populations. These understandings are important when tailoring culturally appropriate health interventions.

### 3.6 Study instruments

A number of instruments were employed to collect information about perceived and estimated absolute CHD risk of the study participants, including the Depression, Anxiety and Stress Scale (the DASS 42), which is a valid and reliable 42 item self-report inventory, which measure depression, anxiety and stress level of responder experienced in the preceding 7 days. The DASS has already been validated and widely used in culturally and linguistically diverse populations. As there were no identifiable instruments to assess perception of the risk of CHD in this population, some investigator-developed instruments were undertaken. Although the limitations
of this approach are noted in relation to both internal and external validity, this approach was considered to be important in creating instruments appropriate to the study populations. Items for the investigator-developed instruments were generated following an integrative literature review on risk perception and informed by the study conceptual model (see Figure 2.5). Yet, personality type and perception of general health status included in the conceptual model were not measured in this study, because of the predetermined nature of personality type and to reduce respondent burden. In developing the instruments careful consideration was made of considering cultural sensitivity. The study schemata are shown in Table 3.1 and the instruments described subsequently.

**Table 3.1 The Middle-Eastern Study Schemata**

<table>
<thead>
<tr>
<th>Focus group</th>
<th>CRQ</th>
<th>PCRQ</th>
<th>DASS</th>
<th>The Non-Laboratory-Based Method</th>
<th>The Framingham Risk Score</th>
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<td>✓ PCRQ Ver. A&lt;sup&gt;1&lt;/sup&gt;</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Study Two</td>
<td>-</td>
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<td>✓ PCRQ Ver. B&lt;sup&gt;2&lt;/sup&gt;</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

1. CHD Risk Factor Questionnaire- Version A
2. CHD Risk Factor Questionnaire- Version B
3. Perception of CHD Risk Questionnaire- Version A
4. Perception of CHD Risk Questionnaire- Version B

### 3.6.1 CHD Risk Factor Questionnaire-Version A (CRQ-Ver. A)

This questionnaire consisted of 67 questions and was designed by the researcher to elicit information about social, biological and behavioural risk factors of the study participants without heart disease (see Appendix C). The questionnaire was designed to be administered in a face to face interview schedule, and the participants completed the study instruments with the assistance of a health care interpreter. The
first part of the questionnaire was designed to obtain data on participants’
demographic information, socio-economic status and social isolation, followed by
questions related to family and personal medical history as well as biochemical and
physical data. Some questions were cut short if there was no application for a
particular participant. For example, if a respondent did not smoke, the questions
related to smoking were not asked. Content (face) validity for the questionnaire was
established by sending the proposed instrument to experts in the field of cardiology,
including a cardiology specialist, a cardiac rehabilitation nurse, and the study
supervision panel as well as two experts in the field in the school of Nursing, Tabriz
University of Medical sciences, Iran. After including the experts’ suggestions, the
questionnaire was administered to participants without heart disease. These variables
are described in details below.

**Marital status**

Marital status was grouped into 5 categories, including never married, married,
separated, divorced and widowed.

**Income**

Given the increasing evidence on the association between socio-economic status and
development and prognosis of CHD, the questionnaire included a few questions to
elicit information about socio-economic status of the participants, including post
code, accommodation, employment, type of employment (permanent/casual and
fulltime/part time), private health insurance and income.

**Level of education**

Level of education is broadly defined as an indicator of socio-economic status in the
literature. Level of education was measured by asking two questions, including
total number of formal schooling years completed and the highest degree achieved.
The later question was categorised into 6 items, including never attended school, primary school< 7 years, secondary school< 10 years of school, secondary school< 13 years of school, trade school and university degree.

**Ethnicity and cultural background**

Ethnicity and cultural background influence CHD risk, causal attributions, help-seeking behaviours and the use of primary and secondary prevention programmes. Information about cultural background of the participants was obtained by asking 4 questions, including country of birth of self, mother, and father as well as self-identified cultural group. Further, the length of residence in Australia was questioned as an indicator of the degree of acculturation.

**Religion**

The participants were also asked about their religion, as religion has been shown to influence health and illness beliefs and behaviours. Small number of women were practicing religions other than Islam, therefore, further analysis on this variable was not included.

**Social support**

The literature suggests that lack of social support is associated with development and prognosis of CHD. The association between immigration and feeling of social isolation among Middle Eastern immigrants has been widely documented in the literature. In this study, social isolation of the participants was assessed by asking a few questions, such as whether they had some body to take care of them at home.

**Family health history**

A family history of heart disease raises the risk of CHD and has been related to increased perception of personal risk. The participants were questioned weather
they had a family history of heart disease, stroke, diabetes or renal disease to wrap up
the influence of these factors on the study participants’ perception of personal CHD
risk. The participants were also asked whether they had a family history of cancer.
There is evidence that women with a family history of cancer were more likely to
underestimate their personal CHD risk.\cite{255}

**Personal health history**

Further pre-existing heart disease has been shown to influence the perception of
personal CHD risk.\cite{239,243} In this study, personal history of heart disease, stroke,
diabetes, renal disease and cancer were also questioned. Further, the participants
were enquired whether they had a history of hypertension or hyperlipidaemia.

The second part of the questionnaire was designed to obtain information about the
participants’ biological and behavioural risk factors for CHD, including age,
smoking, alcohol consumption and physical inactivity. These variables are described
in details below.

**Age**

Information about the age of the participants was collected as continues data.

**Smoking**

Information about smoking status of the participants (including hookahs) and the
degree of dependency to nicotine was collected using self-report Fagerstrom test.
Fagerstrom test is a brief 6-item instrument provided with possible answers. Each
answer gets a set amount of points which are added up and the level of dependency is
calculated. In this study, smoking was defined as regular daily cigarette smoking or
having quitted in the previous 12 months.\cite{304} Yet, as small number of the participants
reported being smoker, further analysis on the Fagerstrom test was not included.
Physical inactivity

Physical inactivity was assessed in accordance with the national physical activity guideline for Australians which recommends at least 30 minutes of physical activity of at least a moderate intensity be accumulated on most, if not all, days of the week to obtain health benefits. Moderate physical activity includes brisk walking, swimming, doubles tennis and cycling.\(^{27}\)

In addition to the above variables, information were collected about physical and laboratory measurements of the study participants, including weight, height, waist and hip circumferences, blood pressure, lipid profile, blood glucose level and renal function. The physical measurements were taken on the site while the participants were referred to the nearest hospital for the blood tests. The results were directly posted to the researcher who kept a copy for her and posted the originals to the study participants accompanied by a latter to their general practitioner explaining the purpose of the conducted test. The protocols for the above measurements are explained in full details below.

Weight

Weight was measured using a digital Royal Club bathroom scale. The scale was placed on a hard surface. The participants were asked to take off their shoes and heavy outer clothes, such as jackets. Display of 0.0 was observed before the participants stood on the scale. Then, the participants were asked to stand with their feet together in the centre while arms were hanging loosely at their sides and head facing forward. The measurements were recorded to the nearest 100g.

Height

The participants were asked to take off their shoes in order to obtain a measurement that is as accurate as possible and stood with their feet together against a wall with a
meter tape stuck on while their back was as straight as possible, arms hanging loosely by their sides, and the participants were facing forwards. An imaginary line passing through the external ear canal and across the top of the lower bone of the eye socket, immediately under the eye was defined before doing the readings. The height measurements were recorded in centimetres.

**Body mass index (BMI)**

Body weight in kilograms, divided by the square of height in meters, was used to calculate the participants’ BMI. The calculated BMI was then compared against criteria recommended by WHO, as presented in Table 3.2.

**Table 3.2 Classification of BMI**

<table>
<thead>
<tr>
<th>BMI (kg/m²)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5-24.9</td>
<td>Desirable</td>
</tr>
<tr>
<td>25-29.9</td>
<td>Overweight</td>
</tr>
<tr>
<td>≥ 30</td>
<td>Obese</td>
</tr>
</tbody>
</table>

**Waist and hip circumferences**

A waist circumference measurement below 80 cm is recommended for women. Using a non-stretch tape, the narrowest point between the ribs and the hips of the participants were measured as waist circumference. Measurement of the hip circumference was then undertaken by using the tape around the hips at a horizontal plane and the measures were taken to the nearest centimetre.

**Waist-hip ratio (WHR)**

The WHR, defined as waist circumference divided by hip circumference (m)/hip girth (m), is a measure of deposition of central obesity. It has been shown that
WHR to be a better predictive of CHD than BMI and waist circumference in Australian population. WHR > 0.80 has been related to an increased risk of CVD.

**Blood pressure**

Using Omron automatic blood pressure monitor, blood pressure (BP) of the participants was measured at the end of interviews to allow the participants to take enough rest and relax prior to the measurement. Right arm was used for measurement in all participants. One reading was done for each participant, but in instances where the reading was above normal, three measurements were taken, at least 5 minutes apart, and their mean was recorded. Classification of the blood pressures was conducted as below:

- Women without heart disease were treated as having the risk factor of high blood pressure if they were taking anti-hypertensive medications or had BP ≥ 130 mmHg and diastolic blood pressure ≥ 85.

Women with heart disease were treated as having the risk factor of high blood pressure if they were taking anti-hypertensive medications, had a history of high blood pressure been documented in their medical record, or they meet the below criteria:

- Women ≥ 65 years age who had BP > 140/90 mm Hg (unless they had diabetes and/or renal insufficiency).

- For women < 65 years age or/and those who had renal insufficiency and/or diabetes and had BP > 130/85 mm Hg.
Lipid profile

The lipid profile of the participants was measured using random blood samples. A total cholesterol level (TC) < 5.5 mmol/L, low density lipoprotein cholesterol (LDL-C) < 3.31 mmol/L and high density lipoprotein cholesterol (HDL-C) > 1 mmol/L was treated normal. Further, as a predictive of CHD in women, random plasma triglyceride level (TG) was measured and a measurement between 0.5 - 1.8 mmol/L treated normal.\(^{307}\)

For participants with heart disease, LDL-C < 2.5 mmol/l, TC < 4.0 mmol/l, HDL-C > 1.0 mmol/l and triglyceride (TG) < 1.5 mmol/l were treated normal.\(^{306}\) Apoprotein A1 and Apoprotein B, two glycoproteins predicting risk of CHD, were measured and Apoprotein A1 between 1.00-1.80 g/L and Apoprotein B between 0.86–1.59 g/L were treated normal.\(^{308}\) There is evidence that the level of Apoprotein B is superior to LDL-C in predicting of CHD risk.\(^{306}\) Further, participants were treated as having the risk factor of high blood cholesterol if they were taking cholesterol lowering medications or had a history of hyperlipidaemia been documented in their medical record.

Fasting blood sugar

Participants were treated as having the risk factor of diabetic if they had a fasting blood glucose (FBS) > 8.0 mmol/l., were taking blood-glucose lowering medications or had a history of diabetes been documented in their medical record.\(^{304}\) Further, glycated haemoglobin level (HbA\(_1c\)) was measured and HbA1c between 4.0%-5.9% was treated normal.\(^{309}\)

Renal function

Serum creatinine (Cr) and glomerular filtration rate (GFR) were measured as indicators of renal function,\(^{310}\) and a Cr between 44–97 μmol/L, GFR > 60
mL/min/1.73m² and blood urea nitrogen (BUN) between 1.8–7.1 mmol/L was treated normal.\textsuperscript{308}

3.6.2 CHD Risk Factor Questionnaire-Version B (CRQ-Ver. B)

This questionnaire, designed to obtain information from participants with heart disease in Study Two, was a modified version of the CHD Risk Factor Questionnaire-Version A and consisted of 63 questions (see Appendix C). Some questions were removed to reduce the respondent overload, for example, Questions number 15 “What is the country of birth of mother?” and Questions number 16 “What is the country of birth of father?”. The questionnaire further modified to make it suitable for the aim of Study Two. These amendments are explained below.

Questions number 40 “What are your current medications?” was changed to 3 closed-ended questions, including “Do you take medication for blood pressure?”, “Do you take medication for blood cholesterol level?”, and “Do you take medication for diabetes?”. The researcher learned from Study One that it was much easier for the participants to recall their medications if they were specifically asked for. Further, data entry to SPSS was found to be easier when closed ended questions were used.

Further, data on Apoprotein A\(_1\), Apoprotein B and HbA1c were not collected for Study Two, because these laboratory tests were not routinely requested at the hospitals in which the study was conducted. Furthermore, two questions were added to the questionnaire to collect data on the participants’ diagnosis and their perception of their diagnosis. Two other questions were added to investigate the participants’ personal causal attributions for their heart disease and whether they had ever attended a CR program. Further, information about the participants’ documented risk factors was collected.
Content (face) validity for the questionnaire was established by submitting the proposed instrument to experts in the field of cardiology, including a cardiology specialist, a cardiac rehabilitation nurse, and the study supervision panel as well as two experts in the field in the school of Nursing, Tabriz University of Medical sciences, Iran. Further, the results from the analyses of data on Study One were also used to make changes in the structure of the survey as a whole.

### 3.6.3 The Depression, Anxiety and Stress 42

Recent studies provide convincing evidence that psychological factors, including depression, anxiety, stress, hostility and personality factors contribute significantly to the development and prognosis of CHD. Information about symptoms of depression, anxiety and stress of the participants was collected using the DASS 42. The DASS is a valid and reliable 42 item self-report inventory, which measure depression, anxiety and stress level of responder experienced in the preceding 7 days. On the DASS score, higher scores are associated with higher levels of depression (range 0-42), anxiety (range 0-42) and stress (range 0-42). Scores considered within the normal range are 0-9 for depression, 0-7 for anxiety and 0-14 for stress. Scores above these ranges indicate the degree of depression, anxiety and stress from mild through to very severe. Gamma coefficients that represent the loading of each scale on the overall factor (total score) has been reported 0.71 for depression, 0.86 for anxiety and 0.88 for stress. Further, the DASS 42 is an appropriate tool to use for screening and outcome assessment in non-clinical samples, and has been widely used both in Australia and overseas for the purpose of research studies, clinical assessment and outcome evaluation.
Although a shorter version, the DASS 21, is also available with 7 items per scale which is easy to use for research and screening purposes, this study applied the DASS 42, because this version has already been translated into Arabic and validated on Arab background population in Australia.\textsuperscript{292} Turkish versions of the DASS 42 were prepared via a registered translation agency for this study. The Persian version of the DASS 42 was available on the website of the Psychology Department of Australia, however, it was found not a quality translation. The researcher, therefore, decided to translate the scale from the beginning to achieve a quality translation. Translation and back-translation of the DASS 42 were conducted following the guidelines suggested by Guillemin et al.\textsuperscript{315} The DASS 42 was translated into Persian by the researcher with vast experience in the translation of English texts. The back-translation was performed by a bilingual expert who had not seen the scale before. The final Persian version of the DASS 42 was achieved following repeated translation and back-translation procedures until all the bilingual experts in the research team confirmed equivalence of the English and Persian versions. The Persian version of the DASS 42 was then sent to a registered translation agency to get their comments. Finally, 10 Persian speaking people read the Persian version of the DASS 42 and gave their comments. After making the amendments, the scale was used to collect data on depression, anxiety and stress status of the Persian speaking participants. This Persian version of the DASS 42 is available on the website of the Psychology Foundation of Australian.\textsuperscript{316}

3.6.4 Perception of CHD Risk Questionnaire-Version A (PCRQ-Ver. A)

In the absence of an accessible, valid and reliable tool in the areas of knowledge and perceptions related to cardiovascular disease, a researcher-developed questionnaire
was developed to obtain information concerning participant’s awareness and perception of CHD risk, risk factors, self efficacy and response efficacy (see Appendix C). The items for this questionnaire were generated from the study socio-cultural model (see Figure 2.5) and formatted similar to Wilcox et al. and Meischke et al.’s questionnaires. In order to assess participants’ perceived personal risk of different disease, Wilcox et al. asked participants to rate, on a 5-point Likert scale from 1 (very low) to 5 (very high), the question “What do you think the chances are of you getting the following diseases sometime in your life?”.

Adopting a similar format, Meischke et al. assessed participants’ perceived personal MI risk by asking participants to rate, on a 5-point Likert scale from 1 (less likely) to 5 (much more likely), the question “compared to other women your age, how likely do you think it is that you could have a heart attack in the next 5 years?”.

Various likelihood scales have been used to assess perceived risk of a given disease, such as percentage scales, 5- or 7- verbally labelled scales, and visual/graphic scales, and there is no consistent evidence indicating superiority of one scale to another one. Weinstein believes that assessing lay perceptions of probability is highly challenging, as people do not often think in terms of percentages, odds or the units used by scientists to express an event likelihood. The use of merely verbal categories is not suggested because of deferent meaning that verbals may have to people. On the other hand, verbal labels have been found by the participants to be easier to use and appear to represent respondents’ true feelings and perception of risk better than numeric scales.

This study applied an 11 item Likert type scale, and items were rated both numerically and verbally. A similar type of scale has been used to assess women’s perceptions of risk for breast cancer and the perception of risk in smokers. This type of scale allows the researcher to treat the data as continue
data, enabling effective descriptive and inferential statistical analysis, such as calculating means.\textsuperscript{319}

Perception of CHD Risk Questionnaire-Version A is consisted of 22 questions. The first 4 questions were designed to assess the awareness of the participants of the burden of heart disease, followed by 11 questions which aimed to elicit their beliefs and perceptions about the contribution of each potential CHD risk factor to the development of the disease in general. In other words, these items were framed on a non-personal basis that is germane to other women, such as “If a woman has a high blood pressure, how likely do you think it is that high blood pressure increases her risk of developing a heart problem?”. The questionnaire also included 2 questions to assess the respondents’ perception of their personal absolute CHD risk in the next 5 and 10 years. For example, “How likely is it for you to have a heart problem in the next 5 years?”. Additional questions assessed the participants’ perception of their personal relative CHD risk in the next 5 and 10 years. For example, “Compared to women in your same age group, how likely is it that you could develop a heart problem in the next 10 years?”. These items were rated both numerically (0-10) and verbally (very unlikely-very likely). The extend to which reducing personal CHD risk was important to the participants was also questioned and the item rated both numerically (0-10) and verbally (not important-very important). Further, considering the significance of self efficacy and response efficacy in risk reducing behaviours,\textsuperscript{215,320} these concepts were measured using one question each. Single item has been widely used to measure the concept of self efficacy.\textsuperscript{321-323} These items were rated both numerically (0-10) and verbally (not confidant-very confidant). Scores were grouped into thirds (tertiles) in that scores from 0-3 were treated as below average, 4-6 not sure, and scores from 7-10 as above average. This type of grouping an 11-
point Likert scale has been used by researchers when assessing respondents’ feelings and emotions.\(^{324}\) Although data is lost by clustering, the primary objective of grouping the data in this instance is to present an overview that is simple and clear for the reader. The untransformed data of these variables was used for calculating medians.\(^{325}\)

After ascertaining face validity from content experts, the questionnaire was administered to sample of participants without heart disease. There was acceptable internal consistency for the questionnaire (Chronbach’s alpha= 0.62).

### 3.6.6 Perception of CHD Risk Questionnaire-Version B (CRQ-Ver. B)

This questionnaire was a modified version of the Perception of CHD Risk Questionnaire-Version A and consisted of 22 questions (see Appendix C). The modifications were made to make the questionnaire more suitable for Study Two. These amendments are explained below:

Question 15 “Do you think that moving to another country increases the risk of developing heart problem in women?” was removed from the questionnaire. Question 16 “How likely is it for you to have a heart problem in the next 5 years?” changed to “How likely is it for you to have another cardiac event in the next 5 years?”. A similar amendment was made to Question 18. One more question was added to address perceived severity of the current heart problem. This item was rated both numerically (0-10) and verbally (not severe-very severe). After ascertaining face validity from content experts, the questionnaire was administered to sample of participants with heart disease. There was strong internal consistency for the questionnaire as a whole (Chronbach’s alpha= 0.82).
### 3.6.7 Estimated absolute risk of CHD

In order to examine the accuracy of the study participants’ perception of their personal risk, information about their absolute CHD risk were needed. Some previous studies relied merely on epidemiological data to examine the accuracy of participants’ perception of risk and did not refer to the participants’ absolute risk. However, the conclusions would be more accurate if the participants’ estimated absolute CVD risk is taken into account.\(^\text{185, 326}\)

The initial intention of this study was to use the Framingham risk score to estimate absolute CHD risk in the study participants (see Appendix C). However, assessment of CHD risk using the Framingham risk score requires information about blood cholesterol level and blood glucose level. As the majority of the participants refused to have their biochemical measurements checked, calculating their estimated absolute CHD risk by means of the Framingham risk score proved to be impossible. The participants told the researcher that the main reason for refusing venepuncture was fear of the consequences, followed by family responsibilities and lack of time. Further, the Framingham risk score has been criticised for not taking into account some CHD risk factors, such as inactivity or obesity which are also important in developing CHD.\(^\text{104, 110}\) Also, applicability of the Framingham risk score to minorities is under question. A validation study of the Framingham risk score on minorities in UK suggests using of a lower threshold of CHD risk in African origins and south Asians in order to identifying and treating a higher probability of those with a risk of \(\text{CVD} \geq 20\%\).\(^\text{327}\) Consequently, this study used recently developed non-laboratory–based method to estimate the participants’ 5-year absolute CVD risk in Study One.\(^\text{106}\) This method has been reported to have the same accuracy to estimate CVD risk as laboratory methods and includes the same risk factors as the
Framingham risk score, but uses BMI instead of cholesterol level and self-reported history of diabetes (see Appendix C). Some limitations of this method include: 1) the method trusts on participants’ report of their history of diabetes; 2) does not assess the relative CVD risk and; 3) cannot be used to estimate CVD risk in individuals younger than 35 years of age. Accordingly, only estimated absolute risk of the participants was calculated and participants under 35 years old were excluded from the risk assessment. According to this method, participants with a 5-year CVD risk \( \leq 10\% \) were categorized as low risk, \( >10-20\% \) moderate risk, and \( >20\% \) as high risk of developing CHD.

Participants in Study Two were categorized at high risk, at risk or at optimal risk, as suggested by the 2007 update evidence-based guidelines for cardiovascular disease prevention disease in women. According to this guideline, women with established CHD, diabetes mellitus and some other cardiovascular conditions as well as end-stage or chronic renal disease are treated as high risk, and those with one or more major CVD risk factor, such as obesity, physical inactivity and smoking as at risk (see Appendix C).

### 3.7 Focus groups

Focus groups are increasingly becoming popular in deriving a collective perspective and studying of phenomena about which little is known. Commonly, focus groups consist of 5-15 people who discuss and share their opinions and experiences about a particular issue with guidance of a moderator. Focus groups promote interaction and stimulate the thinking of others in the group. This decreases the influence of the researcher and gives more weight to participants’ opinions. Angus et al successfully applied this method to explore participants’ opinions, knowledge and
experiences in relation to cardiovascular risk behaviours. The authors suggested that by creating an opportunity for the group members to stimulate each other to comment and question, focus group method provided in-depth information about CVD risk. Focus groups are particularly suggested in studying under represented and marginalized population, such as women and investigating cultural perspectives of those who are not part of the mainstream culture. Vogt et al. argues that researchers are likely to interpret the experiences of participants from other cultures based on their own cultural beliefs and values when using traditional research methods, leading to making inaccurate assumptions about the meanings of some behaviours and experiences. It is often the assumption of commonality and acceptance that increases the utility of focus groups in investigating cultural perspectives. Social interaction and processes within the group setting can encourage and stimulate the participants to share their beliefs and ideas with those of similar socio-economic, ethnic and gender backgrounds. The method can be tailored to meet situational factors and the needs of the target population.

Focus group method also facilitates access to research participants who may find one-on-one interviews intimidating. Gibbs argues that interactions among participants in a focus group would ease their involvement in group discussions which is the uniqueness of this method. Finally, feasibility is another issue to be taken into account when selecting an appropriate methodology. Focus groups are a collective rather than an individualistic approach and emphasise on participants’ shared feelings, experiences and beliefs, so they are cost effective. In view of the policy of the New South Wales Area Health Services which mandates using a health care interpreter in all research projects involving population groups whose first language is not English, the cost of conducting individual interviews would have
been extremely high, considering that all study participants came from non-English-speaking backgrounds.

As a minority group, Middle Eastern women are possibly among the most marginalized and underrepresented population in Australia.\textsuperscript{337} Social, political and economic factors fuel this perspective of marginalization.\textsuperscript{337} These factors contribute to the limited knowledge that is accessible to health professionals concerning the health beliefs and behaviours of immigrant Middle Eastern women, particularly in relation to cardiovascular health. Focus groups were used to capture the shared views of the study participants regarding CVD risk and their risk-reducing behaviours. The aim of the focus groups was to bring forward cultural information that could inform the content and structure of a cardiovascular prevention program targeting culturally and linguistically diverse populations.

### 3.8 Presentation of the researcher in the study process

When using qualitative approaches, the researcher acts as a research instrument and is central to the collection of data, analysis, and interpretation of data. Therefore, it is possible that the assumptions, biases, experience, and even personal characteristics of the researcher, such as age, sex, and ethnicity influence the quality of research and the level of acceptance by study participants and ultimately study findings.\textsuperscript{338} Although, qualitative methods are often criticized by quantitative researchers for providing subjective, biased, and unreliable findings, the openness and closeness of a qualitative researcher to the study participants’ everyday life and situations is more likely to derive a better understanding of the subject under investigation.\textsuperscript{339} Providing the values, perspectives, and experiences that the researcher brings to the research is, therefore, important in assisting the reader to consider the degree of researcher’s
participation and the influence of the researcher’s characteristics on the study findings. The unique perspective that the researcher has brought to the Middle Eastern Women is briefly detailed below.

The researcher is female and was born in Azerbaijan, a province in the North West of Iran, which is neighbouring Turkey and Azerbaijan. Although Persian is the official language of Iran, people in Azerbaijan mainly speak their mother tongue which is Azerbaijani. They share a great deal of commonalities in the culture, language and religion with Turkey. The researcher shared language, culture and religion with participants from Persian and Turkish backgrounds. The Arabic language and culture is distinct from Persian and Turkish, however, geographical proximity and shared religion meaning that the researcher was familiar with the Arab values and culture as well as traditions, such as food habits. This knowledge may have influenced the analysis and interpretation of study data.

After completing her bachelor and master degrees in Nursing, the researcher worked as a cardiovascular nurse and nurse educator in Madani Heart Hospital, Tabriz, Iran (a setting for Study Two) for 7 years. During this period, the researcher encountered patients and careers that had limited knowledge about heart disease and its risk factors. Many of cardiac patients were not aware of their diagnosis. On the other hand, health professionals felt overwhelmed by lack of compliance to prescribed medical regimens by patients. While giving care, the researcher noted that many patients had poor knowledge and inaccurate perceptions of CHD risk, risk factors and their casual attributions. For example, one patient was re-hospitalised for the second cardiac event following recommencing farming after his first acute myocardial infarction just two weeks before. An another example is when explaining to a patient about his heart attack and the importance of reducing risk factors, his relative
Chapter 3: Study Design and Methodology

Embarrassingly pulled the researcher aside and told that the researcher was not supposed to tell the patient about his diagnosis, as his doctors would not like it. These experiences have enhanced the researcher’s awareness about the importance of taking into consideration patients’ beliefs and perceptions about their heart disease and inspired her to understand the ways that cardiac patients understand their heart disease and risk factors.

The researcher came to Australia in 2005 to undertake a higher education leading to the degree of PhD. Meanwhile, she became familiar with some Iranian, Arab and Turkish immigrants in Australia and attended over and over again at their gatherings and ceremonies as a guest. This also included attendance at the potential participants’ private parties which was mainly mediated by a friend. The researcher’s experience of chatting with the potential participants and observing their everyday life practices enhanced her awareness and interest on Middle Eastern women’s lifestyle, particularly in relation to cardiovascular health. These experiences may have also influenced the interpretation of the study data. The study participants may also have treated the researcher as someone with similar cultural background and experience. This may have contributed in the development of rapport and a trusting relationship between the researcher and participants and influenced their decision to participate in the study. Further, being of the same gender which is culturally more accepted in Middle Eastern culture facilitated the recruitment process.

3.9 Data analysis

3.9.1 Quantitative data analysis

There have been no formal power calculations in light of the exploratory nature of this study and the lack of characterisation of the study population. The data derived
from this study are intended to provide important baseline data upon which to power future intervention studies. The Statistical Package for Social Sciences (SPSS 15) was used to analyse the quantitative data. The significance level was set at 5%. A distribution of frequency was used to display the distribution of the variables, including demographical characteristics of the participants, CHD risk factors, subscales of the DASS 42 and perceived and estimated CHD risk. As the majority of the participants in Study One (76%) refused venepuncture for the laboratory tests, results of analysis on biochemical measurements of only 16 (24%) participants are presented. Consequently, no further analysis other than descriptive statistical analysis was conducted on the biochemical data, such as classification of the data and examination of the associations.

Inferential statistical analysis was conducted to examine the associations between the perception of risk and depression, anxiety and stress levels and the study participants’ demographic variables, casual attributions and perception of CHD risk. Single item scores in the Perception of CHD Risk Questionnaire-Version A & B (causal attribution to potential CHD risk factors, perception of personal CHD risk, self efficacy and response efficacy) were treated as continuous data and analysed using both parametric and nonparametric statistical methods, considering the assumptions of normality. An independent samples t-test and one-way analysis of variance were used for comparing means in normally distributed variables. Skewness/standard error of skewness between -2 and +2 was treated as satisfying the assumption of normality. Further, homogeneity of variance test was applied before using post hoc test. Mann-Whitney U and Kruskal-Wallis H tests were used for comparing means in non-normally distributed variables. Chi-square test was applied to the analysis of the relationship between two categorical variables.
The Pearson’s correlation for continuous variables was applied to test the associations between perception of CHD risk and casual attributions as well as demographic characteristics, such as age and education. The variables were first examined for assumptions of normality and linearity, using skewness/standard error of skewness test and ANOVA test of linearity respectively. For not normally distributed variables, Spearman's coefficient rank correlation was used.

### 3.9.2 Qualitative data analysis

As suggested for qualitative studies, data collection and data analysis of the focus groups were carried out simultaneously. Krueger believes that the sense of the group, mood and enthusiasm with which the participants talk to each other may fade or get confused with other focus groups if analysis is delayed or focus groups are scheduled in short intervals. Bearing in mind the potential problem, the study focus groups were scheduled at least one week a part, giving the researcher enough time to undertake a preliminary analysis of the previous focus group and be prepared for exploring emerged themes at the next focus groups. Data analysis was conducted on verbatim transcriptions of the data, hand-written field notes and the researcher’s own thoughts following each group, so called a personal file. The personal file included the researcher’s own thoughts about how the group discussions all went, interactions between the participants and any particularly interesting issues came up. The transcriptions were then read and re-read to immerse the researcher in the data. When a general idea of the data was achieved, the transcriptions were entered NVivo 7, a qualitative data analysis software, for analysis. Qualitative content-thematic analysis was used to analyse focus group data. This is classifying words into categories based on their conceptual significance. In the initial phase, ideas and concepts were coded as free nodes and subsequently similar incidents. Reflections and
comments were grouped together into categories under a specific node, such as financial considerations. When the idea or concept reappeared later, it was coded again under the same node. Gomm advocates assigning codes from the data and believes that the entire range of possible codes is lost when using predetermined codes. The data were then labelled and organized into categories based on groups of words with similar meanings leading to emergence of major themes, a method suggested by Krueger when analysing focus groups data. The researcher then looked for patterns making comparisons and contrasting within a group, among the groups of each culture and also across cultural groups. Attention was also placed on the range and diversity of experiences or perceptions within group and across groups. The initial themes were validated by subsequent probing of the next focus groups. Consequently, the important themes and their degree of emphasis that underlie comments of the participants with regard to study questions were merged and supported by the available evidence. Further, data from field notes and personal notes helped the researcher to interpret and understand the emerging themes. Following preliminary analysis, no major differences were noticed across the cultural groups and therefore data were pooled.

A reflective and iterative process was used to maximise the validity of data interpretation and minimise external bias of the data, a strategy suggested by Krueger. The principal supervisor of the researcher (PMD) and an independent doctorally-prepared qualitative researcher participated in the analysis. The draft report was then sent to supervisory panel to provide their feedback. The researcher, supervision panel and the project governance team from the Service of Clinical Excellence discussed the credibility of the appeared themes together and an
agreement was achieved on the emerged themes eventually, a method suggested by Krueger\textsuperscript{341} to increase the credibility of the findings.

### 3.10 Qualitative data quality

There is no a clear consensus on the quality criteria for qualitative studies, as there is no unified body of theory or methodology described as qualitative research.\textsuperscript{344} However, the need to ensure rigor as a measure of reliability and validity in qualitative research has been widely documented, although not clearly defined in the literature.\textsuperscript{307, 345, 346} Some qualitative researchers argue that the reliability of qualitative research should not be judged according to quantitative criteria and suggest an alternative terminology to describe different concepts of qualitative studies, such as trustworthiness.\textsuperscript{307, 344} The research is trustworthy if the results reflect the experiences of the participants as much as possible.\textsuperscript{347} Trustworthiness includes: credibility, which reflects accuracy and truthfully of representing the data;\textsuperscript{347} dependability, which relates to reliability; transferability, which reflects external validity; and conformability, which is largely an issue of presentation.\textsuperscript{344, 345} A study is said to be trustworthy when the data has been presented accurately and truthfully.\textsuperscript{347} Whereas some qualitative researchers advocate member check as the most critical technique to establish credibility, others argue that it should not be expected that expert researchers or participants arrive at the same themes as the researcher and believe that attempts to increase reliability involves an artificial consensus in the analyses of the data which put at risk the validity or meaningfulness of the findings.\textsuperscript{348}

Krueger\textsuperscript{341} proposes several systematic steps to enhance the authenticity of the findings of focus groups.\textsuperscript{341} These systematic steps were applied in the Middle
Eastern Women Study. The protocol for the focus groups included audio-recording and additional notes were taken by the assistant moderator. Discussion was also recorded if the discussions undertaken by the health care interpreters and bilingual health care interpreters assisting with the focus groups and all the data were verbatim transcribed and coded using software Nvivo 7. Further, a systematic step applied to ensure that the researcher understood the intention of the participants clearly. This occurred by summarizing the critical points at the end of each focus group and asking the participants to confirm their accuracy. A debriefing session between the moderator, assistant moderator and the interpreter immediately after each focus group enabled capturing the first impressions and highlighting similarities and contrasts with the findings of the preceding focus groups. Finally, the researcher’s principle supervisor and an experienced research assistant read the raw data and gave their comments on the emerged themes. This technique is widely used in qualitative studies to ensure the validity of the findings.\textsuperscript{225, 349}

3.11 Project governance
A steering committee constituted of stakeholders and experts allowed consultation and feedback from the project as well as monitoring timelines and ensuring the project governance. Terms of reference and the members are presented in Appendix E.

3.12 Ethical consideration and protection of participants
This study received ethics approvals from human research ethics committee of Sydney West Area Health Service and the University of Western Sydney (see Appendix A). The following consent protocol was undertaken in order to balance the need to obtain informed consent to include women with low literacy. Issues of
literacy impeded the translation of the participant information and consent form into multiple language groups. As a consequence, an interpreter explained the study in the participants’ first language. Once it was ascertained that the participant had a clear understanding of the research process, they were asked to sign the consent form (see Appendix B). This study also received ethics clearance from both the university and the hospital in Iran where the study Two was undertaken. For participants who were recruited from Iran, the researcher explained the study in the participants’ first language and obtained verbal consent from the participants. Obtaining a verbal consent is sufficient for conducting research in Iran. The researcher complied with the recognised principles of research conduct in Australia and Iran and in the honest and ethical conduct of research and dissemination and communication of the results. The researcher was respectful of the participants’ rights, beliefs, perceptions, customs and cultural heritage.

3.13 Data management and storage

All tapes and documents related to the study are kept in a locked filing cabinet in the School of Nursing at the University of Western Sydney for a period of five years. At the end of this period data will be destroyed by means of shredding.

3.14 Summary

This chapter has presented the philosophical underpinnings for the study, described the research design and justified the use of a mixed method approach to address the study questions. In the following chapters, specific methodological considerations for Study One and Study Two are described, followed by the study findings.
Chapter Four

Study One
4.0 Introduction

The previous chapter has described the overarching methodological considerations for the Middle Eastern Women Study. This describes procedural considerations, the results and the discussion for Study One.

4.1 Study aim and questions

Study One aimed to describe the relationship between perceived and estimated absolute risks of developing CHD among Middle Eastern women who had not experienced hospitalisation for a diagnosis of heart disease. This was done to elucidate the socio-cultural perspective of the risk of heart disease among women who had limited engagement with mainstream health services. The study sought to achieve the aim by addressing the following research questions:

1. In what way do Middle Eastern women without heart disease perceive the risk of CHD and risk factors in general?

2. In what way do Middle Eastern women without heart disease perceive their personal CHD risk and risk factors?

3. What behaviours do Middle Eastern women employ to reduce their risk for CHD?

4. What is the estimated absolute CHD risk of Middle Eastern women without heart disease?

5. Is there congruence between estimated and perceived risk of CHD and risk factors among Middle Eastern women without heart disease?
6. What is the association between socio-demographic characteristics and CHD risk and risk factors in the study sample?

4.2 Study Design

Three separate but complementary methods were used to collect data for Study One:

1. Survey methodology was used to describe the participants’ socio-demographic characteristics, risk factors and their perceptions of CHD risk, risk factors, self efficacy and response efficacy.

2. Physical and biochemical measurements were collected from the study participants.

3. Focus groups were used to elicit data about the participants’ collective perception of the risk of CHD, the associated risk factors and risk reducing behaviours.

4.2.1 Brief description of methodology of Study One

Participants completed study instruments before participating in a focus group. This was done on the same occasion. The survey was developed using both investigator-developed questionnaires and validated instruments as described in Chapter Three. The conceptual model, as discussed in Chapter Two, informed the item generation for the survey and the question route for the focus groups. The CHD Risk Factor Questionnaire-Version A was used to collect information related to biological, behavioural and socio-economical risk factors of the participants. Physical and biochemical data were collected as described previously. Further, the CHD Risk Perception Questionnaire-Version A was used to collect data on participants’ perception of some potential CHD risk factors, their perception of personal risk,
levels of self efficacy and response efficacy. The level of depression, anxiety and stress of participants was measured using the DASS 42, which was administered in the first language of the participants while the other questionnaires were administered in English with the assistance of a bilingual health worker and health care interpreter. Participants were then given laboratory test request forms and the option of attending the nearest hospital in their preferred time or in an organised time and along with other participants and the presence of researcher to facilitate the procedure. After completing the survey questions and physical measurements, the participants attended focus group discussions in their first language, facilitated by a health care interpreter, a bilingual health worker and the researcher.

4.2.2 Inclusion criteria

Women who identified themselves as belonging to the Middle Eastern culture and met the following criteria were eligible to participate in Study One if they were:

1. Permanent residents of Australia

2. Age $\geq$ 20 years (Clinical guidelines are recommended for the prevention of CVD in women $\geq$ 20 years of age)$^{110}$

3. Of Persian, Arabic or Turkish origin and identified using this as their first language

4. Able to give written informed consent with the assistance of a health care interpreter

4.2.3 Exclusion criteria

Women were excluded from Study One if they:
1. Had a history of heart disease

### 4.2.4 Recruitment

Recruitment of the study participants, particularly minorities, in research process is highly challenging. Random sampling techniques can be expensive and time consuming rendering them problematic, particularly when involving ethnic minorities. Snowball sampling is often suggested as a practical sampling technique when studying ethnic minorities. This technique is particularly useful when either there is no reliable population list or potential participants are not easily accessible. The current study applied snowball sampling in which existing participants recruited further participants from their social networks and recommended suitable friends and acquaintances for the research. Further, this process was seen to be an important part of community engagement as part of the overarching project in SWAHS.

In an attempt to improve the recruitment rate, the researcher used a number of techniques suggested in the literature. Based on initial consultations with key informants and representatives of these cultural groups, local radio stations and newspapers were engaged to invite the eligible participants to the study (see Appendix D). Further, bilingual social workers, employed in the Iranian Hamyari Association as well as the Turkish Cultural and Welfare Centre, assisted with distribution of invitations and recruitment of the participants. The purpose of the study was also advertised on the notice board of participating community centres and thereby eligible participants were invited to the research project in their first language. An expression of interest form was provided in the centres for those who were interested in participation. These strategies ensured distribution of the study
invitations as widely as possible. Those who expressed their interest in participating in the study provided their contact details and were then contacted by the bilingual social workers and informed well in advance of the venue, time and date of the focus groups. Further, in order to facilitate the recruitment, bilingual health workers, bilingual social workers and representatives from the minority groups were included in steering committee of the study and kept informed of the study progression. Meetings were also conducted in local restaurants and community settings. These strategies contributed to the credibility of the research project within the local community and also helped establish a trusting relationship between the researcher and the study participants. In addition, involving representatives of the target communities informed the culturally appropriate conduct of the study as well as gaining a deep understanding of the concepts under investigation. The researcher also made a commitment to share the research findings with the involved communities, potentially fostering participation in the study.

Consistent with research in minority groups, there were challenges in contacting and recruiting study participants. Although some volunteers were happy to participate in the study in which the researcher was of similar culture and ethnicity, others expressed reservation in participating in the research. Further, in spite of providing a clear explanation of confidentiality, some volunteers asked numerous times about the application of their data, reflecting suspicion that it could be used for non research purposes. There was also a general unwillingness among the participants to sign the consent forms, preferring to give verbal agreement only, probably due to lack of previous research experience or political reservations. Ertan et al.\textsuperscript{353} reported similar issues when recruiting older Turkish people for a psychiatric study.
Efforts were made to recruit participants from different geographical sites, such as Auburn, Parramatta, Bankstown and Mount Druitt in order to obtain a broad perspective to address the study questions. It was important to select persons, settings or events intentionally and purposefully in order to learn and obtain in-depth information. Homogeneity in cultural affiliation was also considered in recruitment of the participants for the focus groups, taking into account their language, religion and education level. Overall, 8 focus groups were conducted, with a total of 66 participants including 25 Turkish, 17 Persian and 24 Arab women contributing to the focus group discussions. There were 4 to 16 participants in each focus group. At least, two focus groups were conducted for each Turkish, Persian and Arab sub-cultural groups and ceased upon data saturation. This enabled identification of patterns and common characteristics as well as the comparison of responses within and across groups. The main socio-demographic characteristics of each focus group are outlined in Table 4.1.

Prior to commencing focus group data collection, a pilot test was conducted at a Turkish Community Centre to identify potential problems. A major obstacle immediately apparent was the attendance of only one participant, although nine others were expected. Following an interview with the social worker, participant and health care interpreter who did attend the pilot test, the researcher learned to consider multiple factors that might affect attendance at future groups. Among these factors, were the weather forecast, the day of the week, school holidays and days immediately following public holidays, the days on which participation rates would be considerably lower. Reminder calls were also instituted the day before the session to ensure and boost attendance at group discussions, as standard preparation for focus groups.
Table 4.1 Characteristics of the focus groups

<table>
<thead>
<tr>
<th>Code</th>
<th>Venue</th>
<th>Date</th>
<th>Participants (N)</th>
<th>Age range</th>
<th>Main characteristics of the group</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Community Health Centre Mount Druitt</td>
<td>02/05/06</td>
<td>Turkish Women (9)</td>
<td>38-60</td>
<td>Religious, middle age and older</td>
</tr>
<tr>
<td>T2</td>
<td>Turkish Cultural Centre Auburn</td>
<td>10/05/06</td>
<td>Turkish Women (5)</td>
<td>38-63</td>
<td>-</td>
</tr>
<tr>
<td>T3</td>
<td>Community Health Centre Mount Druitt</td>
<td>30/05/06</td>
<td>Turkish Women (7)</td>
<td>43-63</td>
<td>Religious</td>
</tr>
<tr>
<td>T4</td>
<td>Turkish Cultural Centre Auburn</td>
<td>05/06/06</td>
<td>Turkish Women (4)</td>
<td>37-55</td>
<td>-</td>
</tr>
<tr>
<td>P1</td>
<td>Iranian Hamyari Association Parramatta</td>
<td>15/06/06</td>
<td>Persian Women (11)</td>
<td>35-56</td>
<td>Forced immigrants</td>
</tr>
<tr>
<td>P2</td>
<td>Nursing Research Unit Cumberland Hospital</td>
<td>28/06/06</td>
<td>Persian Women (6)</td>
<td>30-38</td>
<td>Religious, educated, and young</td>
</tr>
<tr>
<td>A1</td>
<td>Arabic Cultural Group Bankstown</td>
<td>23/07/06</td>
<td>Arab Women (16)</td>
<td>21-60</td>
<td>Religious and forced immigrants</td>
</tr>
<tr>
<td>A2</td>
<td>A participant’s home Parramatta</td>
<td>09/01/07</td>
<td>Arab Women (8)</td>
<td>44-57</td>
<td>Christian</td>
</tr>
</tbody>
</table>

All the focus groups were held in the first language of the participants and moderated by the researcher, who could communicate in English, Persian and Turkish languages. A research assistant took notes during the focus groups. Two out of 8 focus groups were observed by the researcher’s principle supervisor. An interpreter from NSW Health Care Interpreter Service and a bilingual social worker attended all the focus groups to ensure that all presenters understood the discussions, a strategy suggested in the literature and required under Australian government regulation when involving participants from non-English speaking languages.354

There are some shortcomings for the focus group method, yet they can be avoided by addressing the potential limitations, being prepared for in advance and taking timely appropriate actions. One of the disadvantages is that the inclusion of a few very dominant participant may generate biased findings which do not reflect the group viewpoints.334 In this study, focus groups were sometimes at risk by one or two very dominant participants. However, as the researcher was aware of the possibility of its occurrence, efforts were made to avoid the problem by encouraging group members
to become involved in the discussions. Another issue was trying to minimise the dominance of the groups by vocal participants, observing cultural issues, such as respecting older people. Fortunately, the researcher was well-versed in appropriate cultural conduct and was able to gently re-focus discussions within a framework of cultural competence. Further, focus groups are sometimes criticised for being less controlled, possibly resulting in discussions that extend beyond study purposes,\textsuperscript{334,335} Nevertheless, what is considered a weakness can also be strength because of the potential for emergence of salient, yet unanticipated information. In this study, some emerging topics, such as the impact of immigration on the participants’ life become important to the study, as these emerging topics served better interpretation of the findings. Focus group data is also vulnerable to equipment failure. It is, therefore, important to test equipment prior to focus groups. Yet, the immediate recall via written field notes or researchers’ short term memory can be helpful in mitigating equipment failure and also the first step in qualitative analysis.\textsuperscript{341}

4.3 Conducting the focus groups

A semi-structured topic guide was developed following an extensive literature review\textsuperscript{83} and used to facilitate the collection of relevant information from the participants (see Appendix C). There was minimal adjustment in the question route for each focus group depending on the level of participants’ involvement and in the case of testing themes emerged from the preceding focus groups, a strategy suggested by Krueger.\textsuperscript{341}

At the time of the focus groups, a health care interpreter explained the purpose of the study once more to the participants and read the consent form in their first language. Then, an opportunity to raise questions and voice concerns was given. Once it was
ensured that the participants had a clear understanding of the research process, they were then asked to sign the consent form. Discussions were started by one or two introductory questions, such as “What are your major health concerns?” The purpose of the introductory questions was to get the group to start thinking about the topic at hand and focus on the conversations. These questions also helped the researcher to discover the main health concerns of the participants. Further open-ended questions, which reflected specifically reflecting the purpose of the study, were asked subsequently, such as “What do you think are some causes of heart disease?” These questions were expected to probe for more depth and reasoning behind the participant’s perceptions and beliefs regarding CHD risk and prevention measures.

The moderator needed to acknowledge the participants views and elicit new ideas and marginal perspectives and encourage interaction within the groups. Before the end of the discussions, the moderator summarised the main points presented in the focus group, and allowed the participants to express their final thoughts on the risk of CHD as well as any other issues emerging from the discussions in general. The focus groups lasted for approximately between 60 and 90 minutes each, were audio-taped, transcribed verbatim in the source language and then translated into English. All the transcripts were analysed in English. Further, field notes were taken by a researcher assistant. Light refreshments were provided during the sessions. Further, the participants were given a complimentary heart key ring accompanied with a short verbal message “Take care of your heart”.

4.4 Survey results

Although there is considerable information about the trends in CHD risk factors among Australian population that is available through state-based and national studies, including the National Heart Foundation Risk Factor Prevalence Surveys
(1980, 1983, and 1980) and Australia Diabetes, Obesity and Lifestyle Study (1999-2000), little is known about the prevalence of CHD risk factors in minorities, particularly Middle Eastern women living in Australia. The section below describes the socio-demographic characteristics of the study participants, their CHD risk factor profile and causal attributions. The participants’ perceived personal absolute and relative CHD risk and the associations of these perceptions with the participants’ CHD risk factors are presented subsequently.

4.4.1 Statistical analysis I: Descriptive analysis

Socio-demographic characteristics and CHD risk factors of the participants

The socio-demographic characteristics and CHD risk factors of the participants are summarised in Table 4.2. The mean age of the participants was 44 ± 11.63 years, ranging in age from 21 to 63 years. Participants were all first-generation immigrants who arrived in Australia between 1969 and 2005 and had lived in Australia between 17 months and 36 years with an average of 16.5 ± 11.98 years of residence. Twenty five (38%) participants were born in Turkey, 20 (30%) in Iran and 21 (32%) in an Arab country, mainly in Iraq (50%). Twenty five (38%) participants identified themselves as belonging to Turkish, 17 (26%) to Persian and 24 (36%) to Arab culture and ethnicity. Further, a large proportion of the participants 50 (89%) did not have anybody helped take care of them at home and they looked after, on average, 3 ± 1.4 persons at home.
Table 4.2  Socio-demographic characteristics and CHD risk factors of participants (n=66)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living with spouse* (%)</td>
<td>81/19</td>
</tr>
<tr>
<td>Education at least up to primary school* (%)</td>
<td>71/29</td>
</tr>
<tr>
<td>Muslim* (%)</td>
<td>92/8</td>
</tr>
<tr>
<td>Paid employment* (%)</td>
<td>14/86</td>
</tr>
<tr>
<td>Living in own home* (%)</td>
<td>42/58</td>
</tr>
<tr>
<td>Private health insurance* (%)</td>
<td>15/85</td>
</tr>
<tr>
<td>Adequate income and more* (%)</td>
<td>56/44</td>
</tr>
<tr>
<td>High blood pressure (BP≥130/85 or taking anti-hypertensive medications)* (%)</td>
<td>33/67</td>
</tr>
<tr>
<td>Current smoker or quitter in the last 12 months* (%)</td>
<td>18/82</td>
</tr>
<tr>
<td>Alcohol drinks* (%)</td>
<td>7/93</td>
</tr>
<tr>
<td>Adequate physical activity* (%)</td>
<td>21/79</td>
</tr>
<tr>
<td>BMI ≥ 25* kg/m² (%)</td>
<td>83/17</td>
</tr>
<tr>
<td>Waist circumference ≥ 80 cm* (%)</td>
<td>91/9</td>
</tr>
<tr>
<td>Waist to hip ratio ≥ 0.80 cm* (%)</td>
<td>68/32</td>
</tr>
</tbody>
</table>

*Missing data

Self-reported family and personal health history

Self-reported family and personal health history of the participants are presented in Figure 4.1 and Figure 4.2. As shown, 19 (33%) participants reported having a family history of heart disease, 16 (27%) stroke, 21 (37%) diabetes, 8 (14%) renal disease and 17 (29%) cancer. Further, 7 (12%) participants reported having a personal history of hypertension, 11 (19%) hypercholesterolemia, 2 (3%) stroke, 3 (5%) diabetes, 2 (3%) renal disease and 2 (3%) cancer.
Figure 4.1  Self-reported family health history

Figure 4.2  Self-reported personal health history (n=66)
Biochemical risk factors of the participants

Table 4.3 displays the percentage of participants who had biochemical measurements above normal limits. It is noted that these data relate to only 16 participants who underwent laboratory tests. Further, all 16 participants had Apoprotein B, fasting blood sugar and GFR within normal limits.

Table 4.3  Biochemical measurements of the participants (n=16)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cholesterol ≥ 5.5 mmol/L</td>
<td>37.5</td>
</tr>
<tr>
<td>Low- Density Lipoprotein Cholesterol ≥ 3.31 mmol/L</td>
<td>37.5</td>
</tr>
<tr>
<td>High- Density Lipoprotein Cholesterol &lt; 1 mmol/L</td>
<td>6.25</td>
</tr>
<tr>
<td>Triglyceride&gt;1.8 mmol/L</td>
<td>31.7</td>
</tr>
<tr>
<td>Apoprotein A1&gt; 1.80 g/L</td>
<td>12.5</td>
</tr>
<tr>
<td>Apoprotein B &gt; 1.59 g/L</td>
<td>6.25</td>
</tr>
<tr>
<td>Glycated haemoglobin &gt; 5.9 %</td>
<td>6.25</td>
</tr>
<tr>
<td>Creatinine &gt; 97 µmol/L</td>
<td>6.25</td>
</tr>
</tbody>
</table>

Psychological status of the study participants

The psychological status of the study participants including depression, anxiety and stress are summarised in Table 4.4. As measured by the DASS 42 score, about half of the participants reported mild to very severe symptoms of depression 28 (51%), anxiety 30 (55%) and stress 28 (52%).
Table 4.4  Psychological status of the study participants (n=66)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depression</strong>*</td>
<td></td>
</tr>
<tr>
<td>Not depressed (&lt;9)</td>
<td>49</td>
</tr>
<tr>
<td>Mild to moderate (10 to 20)</td>
<td>24</td>
</tr>
<tr>
<td>Severe to very severe (&gt;20)</td>
<td>27</td>
</tr>
<tr>
<td><strong>Anxiety</strong>*</td>
<td></td>
</tr>
<tr>
<td>Not anxious (&lt;7)</td>
<td>45</td>
</tr>
<tr>
<td>Mild to moderate (8 to 14)</td>
<td>26</td>
</tr>
<tr>
<td>Severe to very severe (&gt;14)</td>
<td>29</td>
</tr>
<tr>
<td><strong>Stress</strong>*</td>
<td></td>
</tr>
<tr>
<td>Not stressed (&lt;14)</td>
<td>48</td>
</tr>
<tr>
<td>Mild to moderate (15 to 25)</td>
<td>26</td>
</tr>
<tr>
<td>Severe to very severe (&gt; 25)</td>
<td>26</td>
</tr>
</tbody>
</table>

* Missing data

**Estimated absolute risk against perceived personal absolute and relative risk**

Estimated absolute cardiovascular risk categories of the participants are set out in Figure 4.3. As shown, of 46 participants who were eligible for estimation of absolute cardiovascular risk in the next 5 years, (age 35 and over), 22 (48%) participants were at moderate or high risk of developing cardiac events in the next 5 years.
Yet, the mean perceived personal absolute CHD risk of the participants was $5 \pm 2.34$ and relative risk was $4.5 \pm 1.88$, indicating “not sure”. Data on the perception of personal absolute and relative CHD risk were examined for not violating the assumption of normality, using skewness/standard error of skewness test. There were no statistically significant differences in mean perceived personal absolute ($F=0.14$, $p=0.86$) and relative CHD risk of the participants ($F=0.75$, $p=0.48$) according to the participants’ CHD risk category, using one-way analysis of variance. In other words, participants in high risk group did not perceive themselves at higher absolute and relative CHD risk than low risk groups did. Furthermore, as shown in Figure 4.4 participants in high risk group tended to underestimate their personal CHD risk. Of concern, 10 out of 14 participants (71%) in the high risk group underestimated their risk and 8 out of 24 participants (33%) at in the low risk group overestimated their risk.
CHD risk. Participants tended to have more realistic perception of their relative risk compared with their absolute risk.

![Image of bar graph showing perceived personal absolute and relative CHD risk of the participants according to their CHD risk categories]

**Figure 4.4** Perceived personal absolute and relative CHD risk of the participants according to their CHD risk categories

**Awareness of CHD risk in general**

More than half of the participants 31 (54%) knew someone with heart disease, of whom 19 (61%) participants reported someone in their immediate family having heart disease, yet only 12 (21%) participants were aware that heart disease was the first killer of women in Australia. Further, 17 (31%) participants did not appreciate the risk of cardiac events in people younger than 65 years age.

**Perception of CHD risk factors in general**

Figure 4.5 displays the median ratings of CHD causal attributions in general made by the participants. As data on the perception of CHD risk factors violated the
assumption of normality, using skewness/standard error of skewness, medians are reported instead of means. The most highly attributed CHD risk factors were psychological distress, obesity and physical inactivity and the least lowly were diabetes and menopausal status.

Figure 4.5  Causal attributions to CHD in general

Self efficacy and response efficacy in relation to CHD risk reducing behaviours

Participants highly perceived the importance of reducing personal CHD risk. They also highly believed that engaging in heart healthy behaviours or reducing their risk factors, such as exercising or eating low fat diet protects them from developing heart disease. However, they were not very confident to be able to reduce their personal CHD risk.
4.4.2 Statistical Analysis II: Inferential analysis

Studies have shown that differences in CHD risk factors and perception of risk are explained mainly by differences in socio-demographic characteristics of the population being studied, such as ethnicity and low socio-economic status. This section describes the methods of analysis used to show differences in CHD risk factors in this sample of Middle Eastern women according to their the demographic characteristics. It is noted that these analyses were conducted within the exploratory framework of the study-identifying potential associations to be tested in adequately powered, prospective studies. Using a range of parametric and nonparametric statistical analyses, the participants’ risk factors of high blood pressure, obesity, smoking, inactivity and psychological distress were examined according to their socio-demographic characteristics, such as age and length of residence in Australia as well as perception of CHD risk, self efficacy and response efficacy.

**Systolic and diastolic blood pressure (SBP & DBP)**

Data on SBP, DBP, age, length of residence in Australia, anxiety, perception of personal absolute and relative CHD risk, and attribution to high blood pressure were first examined for not violating the assumption of normality and linearity, using skewness/standard error of skewness test and ANOVA test of linearity respectively.

There was a moderate positive correlation (r=-0.54, p=0.00) between BP and age, with high levels of SBP being associated with older ages, using the Pearson correlation coefficient. The correlation remained significant (r =.34, p=0.02) while controlling for weight, education and length of residence in Australia, using partial correlation techniques. There was also a moderate positive correlation (r =0.42, p=0.00) between SBP and length of residence in Australia, with high levels of SBP being associated with higher years of residence in Australia, but after controlling for
age, using partial correlation, there was no a significant correlation between SBP and years of residence \( (r=0.087, p=0.536) \). There was a low-moderate positive correlation \( (r=0.30, p=0.03) \) between DBP and anxiety scores, with high anxiety scores being associated with higher DBP. There was not a statistically significant correlation between SBP and perceived personal absolute CHD risk \( (r=-0.01, p=.93) \), perceived personal relative CHD risk \( (r=0.16, p=0.24) \), and attribution to high blood pressure \( (r=0.27, p=0.05) \), using the Pearson correlation coefficient.

**Obesity**

Data on weight, perceived absolute and relative CHD risk, self efficacy and response efficacy were first examined for not violating the assumption of normality and linearity, using skewness/standard error of skewness test and ANOVA test of linearity respectively.

An independent samples t-test revealed significant differences \( (t=-2.82, p=0.00) \) in the mean weight scores of participants according to their marital status, with widows or divorced women being more likely to be overweight and obese than married participants. The differences remained significant \( (f=7.79, p=0.00) \) while controlling for age, using univariate statistics. There was a low-moderate positive correlation \( (r=0.324, p=0.021) \) between weight scores and perceived absolute CHD risk in the next 10 years, with overweight and obese participants perceiving a higher absolute risk in the next 10 years, using the Pearson correlation coefficient. There was also a significant low-moderate positive correlation \( (rs=0.315, p=0.024) \) between weight scores and attribution to overweight and obesity, with overweight and obese participants attributing highly to overweight and obesity than non obese participants, using Spearman's coefficient rank correlation. There was no correlation between weight and perceived absolute CHD risk in the next 5 years \( (r=0.256, p=0.070) \),
perceived relative CHD risk in the next 5 and 10 years (r=0.033, \( p=0.816 \); r=0.090, \( p=0.531 \) respectively), using the Pearson correlation coefficient. There was also no correlation between weight scores and self efficacy (rs =-0.067, \( p=0.642 \)) and response efficacy (rs =0.132, \( p=0.357 \)), using Spearman's coefficient rank correlation.\(^{340}\)

**Smoking**

There was statistically significant differences in the mean total number of formal schooling years according to smoking status of the participants (\( U=-2.5, p=0.01 \)), with smokers having a lower number of formal schooling years than non smokers, using Mann-Whitney \( U \) test. There were no significant differences in the mean perceived absolute CHD risk in the next 5 and 10 years (t=-0.98, \( p=0.33 \); t=0.88, \( p=0.37 \) respectively ) and perceived relative risk CHD risk in the next 5 and 10 years (t=0.13, \( p=0.89 \); t=0.49, \( p=0.62 \) respectively) according to the smoking status of the participants, self efficacy (\( U=-1.76, p=0.07 \)) and response efficacy (\( U=-0.16, p=0.87 \)), using Mann-Whitney \( U \) test.\(^{340}\)

**Physical inactivity**

There were no statistically significant differences in the mean perceived absolute CHD risk in the next 5 and 10 years (\( F=0.99, p=0.82 \); F=0.98, \( p=0.38 \) respectively), relative CHD risk in the next 5 and 10 years (F=1.07, \( p=0.35 \); F=0.98, \( p=0.38 \) respectively) according to physical activity status of the participants, using one way analysis of variance. There were also no statistically significant differences in the mean self efficacy (\( \chi^2=0.15, p=0.92 \)) and response efficacy scores (\( \chi^2=0.21, p=0.90 \)) according to physical activity status of the participants, using Kruskal-Wallis \( H \) test.\(^{340}\)
Psychological distress

The relationships between depression, anxiety and stress and socio-demographic characteristics of the study participants were investigated, using a range of statistical analysis methods. Data on depression, anxiety and stress, total number of formal schooling, years of residence in Australia, perception of personal absolute and relative CHD risk, the importance of reducing personal risk were first examined for the assumption of normality and linearity, using skewness/standard error of skewness test and the ANOVA test of linearity respectively.\textsuperscript{340}

There were low-moderate negative correlations between total number of formal schooling years and the participants’ depression ($r_s=-0.29, p=0.04$), anxiety ($r_s=-0.35, p=0.01$) and stress scores ($r_s=-0.36, p=0.01$), with lowly educated participants having higher depression, anxiety and stress scores than highly educated participants, using Spearman's coefficient rank correlation. There were also significant statistical differences in the mean depression ($t=2.56, p=0.00$), anxiety ($t=2.36, p=0.00$) and stress scores ($t=2.85, p=0.00$) according to employment status of participants. Participants not engaged in paid employment had higher depression, anxiety and stress scores than those with paid employment, using an independent samples t-test.

There were no statistically significant correlations between depression ($r=-0.00, p=0.98$), anxiety ($r=0.18, p=0.20$) and stress ($r=-0.00, p=0.96$) scores and the age of the participants, using the Pearson correlation coefficient. There were also no statistically significant correlations between depression ($r_s=0.01, p=0.08$), anxiety ($r_s=0.08, p=0.54$) and stress scores ($r_s=-0.01, p=0.93$) and length of residence in Australia, using Spearman's coefficient rank correlation.

Table 4.5 describes the associations between psychological status and causal attribution to CHD in the study participants. The Kruskal-Wallis analyses revealed
that participants with higher depression, anxiety and stress scores attributed highly to depression ($\chi^2=7.44, p=0.02$), anxiety ($\chi^2=14.32, p=0.00$) and stress ($\chi^2=13.32, p=0.00$) compared with those with normal depression, anxiety and stress scores. There were also statistically significant differences in attribution to physical inactivity according to the participants’ anxiety ($\chi^2=7.86, p=0.00$) and stress ($\chi^2=13.46, p=0.00$) scores. Participants with higher anxiety and stress scores were more likely to believe that undertaking exercise for at least 30 minutes most days of the week could help their heart health. There was, however, no statistically significant difference in attribution to physical inactivity according to the participants’ depression scores ($\chi^2=3.16, p=0.20$).
Table 4.5  Psychological status of the participants and their causal attribution for CHD (n=66)

<table>
<thead>
<tr>
<th>Causal attribution</th>
<th>Depression status</th>
<th>Anxiety status</th>
<th>Stress status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>p-value</td>
</tr>
<tr>
<td><strong>High BP</strong></td>
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<td></td>
</tr>
<tr>
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<td>2.1</td>
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<tr>
<td>Mild to moderate</td>
<td>6.8</td>
<td>2.7</td>
<td>0.33</td>
</tr>
<tr>
<td>Severe to very severe</td>
<td>8.1</td>
<td>1.9</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not distress</td>
<td>7.5</td>
<td>2.7</td>
<td>0.00</td>
</tr>
<tr>
<td>Mild to moderate</td>
<td>7.8</td>
<td>2.4</td>
<td>0.00</td>
</tr>
<tr>
<td>Severe to very severe</td>
<td>8.8</td>
<td>1.7</td>
<td>0.00</td>
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<tr>
<td><strong>Physical inactivity</strong></td>
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<tr>
<td>Not distress</td>
<td>7.8</td>
<td>2.7</td>
<td>0.00</td>
</tr>
<tr>
<td>Mild to moderate</td>
<td>8.5</td>
<td>2.2</td>
<td>0.00</td>
</tr>
<tr>
<td>Severe to very severe</td>
<td>9.2</td>
<td>1.5</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Obesity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>1.8</td>
<td>0.26</td>
</tr>
<tr>
<td>Mild to moderate</td>
<td>8.7</td>
<td>1.6</td>
<td>0.26</td>
</tr>
<tr>
<td>Severe to very severe</td>
<td>8.4</td>
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<td>0.17</td>
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<td><strong>The types of food</strong></td>
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<td>1.8</td>
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</tr>
<tr>
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<td>0.77</td>
</tr>
<tr>
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<td>0.77</td>
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<td><strong>Diabetes</strong></td>
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<td>2.1</td>
<td>0.44</td>
</tr>
<tr>
<td>Severe to very severe</td>
<td>7.1</td>
<td>2.3</td>
<td>0.44</td>
</tr>
<tr>
<td><strong>Depression, anxiety, and stressed</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Not distress</td>
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<td>0.02</td>
</tr>
<tr>
<td>Mild to moderate</td>
<td>8.5</td>
<td>1.4</td>
<td>0.02</td>
</tr>
<tr>
<td>Severe to very severe</td>
<td>9.3</td>
<td>1.1</td>
<td>0.02</td>
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<tr>
<td><strong>Heredity</strong></td>
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<tr>
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<td>7.5</td>
<td>2.6</td>
<td>0.34</td>
</tr>
<tr>
<td>Mild to moderate</td>
<td>6.3</td>
<td>2.8</td>
<td>0.34</td>
</tr>
<tr>
<td>Severe to very severe</td>
<td>6.1</td>
<td>3.4</td>
<td>0.34</td>
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<tr>
<td><strong>Menopausal status</strong></td>
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<tr>
<td>Not distress</td>
<td>6.0</td>
<td>2.1</td>
<td>0.08</td>
</tr>
<tr>
<td>Mild to moderate</td>
<td>5.3</td>
<td>2.1</td>
<td>0.08</td>
</tr>
<tr>
<td>Severe to very severe</td>
<td>7.3</td>
<td>2.0</td>
<td>0.08</td>
</tr>
</tbody>
</table>
Perceived 5 and 10-year absolute CHD risk

There was a low-moderate positive correlation between age and perceived personal absolute (r=0.35, \( p=0.01 \)) and relative (r=0.37, \( p=0.01 \)) CHD risk in the next 10 years, with older participants perceiving higher 10-year personal absolute and relative CHD risk than younger participants. There was no significant statistical difference in the mean perceived 5 (\( r_s=-0.032, \ p=0.833 \)) and the 10-year CHD risk (\( r_s=0.023, \ p=0.878 \)) according to the participants’ formal years of schooling, using Spearman’s coefficient rank correlation. There were statistically significant differences in the mean perception of personal absolute (F=5.13, \( p=0.00 \)) and relative (F= 4.40, \( p=0.01 \)) CHD risk in the next 5 years according to country of birth.

Participants who were born in an Arabic country had lower perception of personal absolute and relative CHD risk than participants from Turkey. Figure 4.6 displays the mean perceived absolute and relative CHD risk in the next 5 years according to the participants’ country of birth. A higher number of the Arab participants in this study refused to undergo the laboratory tests.

![Perceived absolute risk vs. perceived relative risk](image)

**Figure 4.6**  Perceived personal absolute CHD risk of the participants according to their country of birth
There was a statistically significant difference in perceived absolute risk in the next 10 years according to the participants’ family history of heart disease ($t=-2.05, p=0.04$), with participants with a family history of heart disease perceiving a higher personal risk in the next 10 years, but there was no significant difference in the mean perceived 5-year absolute CHD risk according to the participants’ family history of heart disease ($t=-2.05, p=0.04$). Further, there were also no significant differences in the mean perceived 5 and 10-year absolute risk of CHD according to participants’ family history of cancer ($t=0.98, p=0.33; t=-0.46, p=0.64$ respectively), using an independent samples t-test.  

**Response efficacy**  

The Mann-Whitney U tests revealed statistically significant differences ($U=-2.79, p=0.00$) in the mean response efficacy scores according to the employment status of the participants. Participants who had paid employment had a higher perception that engaging in heart healthy behaviours and reducing one’s risk factors of heart disease protects them from developing CHD than unemployed participants. The differences remained still significant while controlling for age and education ($F=5.69, p=0.02$), using univariate statistics. There was no significant difference ($U=-2.79, p=0.00$) in the mean self efficacy scores according to the employment status of the participants ($U=-1.590, p=0.122$).

**4.5 Findings of the focus groups**  

The analysis of the data revealed a number of themes that were commonly shared by the women. Although investigating the family and social concerns of the participants was not the primary focus of this study, these themes emerged from the data and presented the lens through which CHD risk was perceived, experienced and...
negotiated by the women. The three themes which emerged from focus group discussions were: (a) Middle Eastern women underestimated the risk of CVD; (b) stress is a pervasive factor in the lives of Middle Eastern women; and (c) Middle Eastern women face many barriers in reducing their risk of CVD. The emergent themes are described in the below and accompanied by presenting the verbatim quotes from study participants to further elucidate the study themes.

**Middle Eastern women’s perception of CHD risk**

Study participants demonstrated a basic understanding of heart disease, yet were unaware that heart disease is the number one killer of women in Australia. Many misconceptions regarding risk factors and strategies to enact upon chest pain and the potential for a heart attack were evident. Examples of misconceptions included the belief that eating honey would reduce chest pain and breathing from a plastic bag or drinking iced water could circumvent a heart attack. Although the women identified several CHD risk factors, the most common attribution of heart disease was psychological distress, followed by poor diet, particularly including oily food, obesity and physical inactivity. The women explained that the consumption of ‘oily’ food was part of their traditional cultural fare. Also associated with their culture was their perception of smoking. Tobacco inhalation via hookahs was described as more culturally accepted and less harmful than cigarette smoking. Women’s reasons for starting smoking involved sociability, showing independence and encouragement from husbands.

Conspicuous absences from participants’ perceptions of CVD risks included diabetes and post-menopausal status. None of the focus group participants discussed checking their blood pressure and cholesterol levels, actively engaging in weight control, or
checking diabetes status to reduce their risk of CVD. The older and less educated women, in particular, did not appear to value and practice CVD prevention measures until their condition indicated an obvious health problem, as seen in the following excerpt:

“...no, I do not walk, but I’ll do if I see there is a problem” (P2)

“...I will give up smoking, if I get sick and doctor advises me to give it up” (T3)

When asked about their perception of their personal risk of CVD, some of the women responded that there were too many other problems that were of greater concern to them. They found it confronting to discuss their personal risk of heart disease and believed that they should not be expected to know about this issue. Some refused the discussion, took an optimistic stance about their risk, or, particularly the older and more religious women, expressed a fatalistic perspective about health and illness, as seen in the following excerpts:

“...I don’t know what is going to happen in future. Nobody knows” (T1)

“...It didn’t happen and won’t happen to me” (T2)

This apparent refusal to confront potential health risks was evident and reflects cultural beliefs with an increased emphasis on fatalism, however, appraisals of and interactions with medical professionals were influential in engaging in behaviour change. There were comments demonstrating that doctors were highly respected in the Middle Eastern culture. Women were more likely to engage in healthy behaviours if they received advice from their family doctor about the effectiveness of
particular health behaviours, such as physical activity, as seen in the following excerpt from a 53-year-old Persian woman:

“...my doctor said to me obesity is the worst disease in the world. My family doctor said you should lose weight and I started off exercise” (P1)

The above excerpt demonstrates the important and influential role of medical practitioners in CVD prevention programmes. Women also explained that men were more likely to incorporate advice if they received health information from a doctor, as seen in the following excerpt:

“...most Turkish men…. If a doctor tell them 'you have to change your diet, otherwise you are going to die tomorrow'...They have to be told by a doctor that their diet should be changed. Otherwise they won't take it” (T1)

Yet, doctors themselves seemed to contribute a lot in making a stress attribution by women. Doctors appeared to attribute patients’ health condition to stress if no physical cause could be found or the problem could not be justified physiologically.

“...they (doctors) put me on exercise test and MRI. They conducted many other tests, but eventually told me "stress" (T2)

“...doctor said she (a woman who lost her daughter in an accident) had lost her teeth because of stress and was more likely to develop other diseases too” (T3)

In spite of initial reluctance and denial of potential conditions, the women expressed an interest in learning practical ways of improving their cardiovascular health. Participants expressed their dissatisfaction with available health information. The women said that they obtained health information, predominately from unreliable
sources, such as friends, and suggested the need for culturally and linguistically appropriate simple, clear, and practical guidelines which also include the rationale for recommended health behaviour. They suggested that heart health messages should be broadcast when the family is more likely to be together, stressing the importance of involving family members in health care programs reflecting an important cultural consideration.

**The pervasiveness of stress**

Stress emerged as having a significant impact upon the participants’ perceptions of their overall health, including their cardiovascular well-being. Participants resoundingly linked heart disease to emotions, discussing that the individual’s bodily response to stress and tension could cause severe chest pain or heart attack in some people. This reflects the disease attribution of women in these cultural groups. Women in this study perceived themselves as being under significant psychological distress, and at a greater risk of succumbing to depression, social isolation and many physical conditions. Given this perceived link between stress and heart disease, the women’s meanings and experiences of stress were further endeavoured to be elicited.

Women primarily described stress in their lives as emanating from migration and acculturation issues they encounter on a daily basis. For some, distressing and often traumatic circumstances leading to their migration to Australia still pervade their thoughts. Most participants talked about being forced to leave their homelands for political reasons and a subset lived in refugee camps or detention centres, separated from their children. Once in Australia, the Arab women described the persistent anxiety that resulted from hearing about the war in their homelands and thinking about those left behind, as depicted in the following quote:
“...I mean, all these threats, lack of safety, bombs; they are all affecting us, because we still have family members left behind there. When we listen to news, they upset us a lot and we do a lot of crying” (A1)

In addition to this angst felt upon looking back, looking forward to building new lives in their adopted country was likewise daunting. The women felt isolated when confronted with the loss of their support systems, the strain of which is depicted in the following excerpt:

“...you have to start off the life from the beginning; have lost all your supports; you miss your relatives and friends. Well, all together, these things impact your health” (P2)

This perception of loss included not only family and friends, but also having lost a sense of control over their lives in this new land. The women explained that illness or death of accompanying family members was particularly distressing without knowledge of how to manage such issues in their new environments. Even the women who had migrated to Australia several years ago reported that they had no information about health care facilities or available sources of support, further compounding perceptions of a lack of control and isolation. Regardless of age and ethnicity, the lack of social support and psychological distress influenced the women’s perceived risk of heart disease, as evident in the following excerpt from a 36-year-old Persian woman:

“...If I keep living in Australia, I may develop heart disease. I am alone here; no relatives; too much psychological pressure” (P1)
This excerpt highlights one woman’s perception that the experience of stress and other negative psychological states, mainly consequent of migration, could lead to serious physical outcomes, particularly concerning heart health.

**Adopting into the Australian society**

The migration experience and the early period of transitioning into Australian society were not the only sources of stress for the women. Facets of Australian society were described as being incongruous to values and beliefs of the women’s cultural backgrounds, for instance, regarding child rearing and marital relationships. The women explained that having to negotiate the demands of a new society and their husbands’ traditional views and role expectations, often created friction and marital discord. After living in Australia for a period of time, the women became aware that they had equal rights to men which some men found confronting and offensive. They described men as preferring to uphold traditional values, practices and gender roles and being intensely resistant to breaking these traditions. The differences in role perceptions resulted in an increase in arguments between couples, adding to the psychological distress of the women. One Turkish woman described the traditional male role within relationships:

“...Eastern men are more role-player in the family. A lot of things are decided by males rather than female in the families. Yes. There are cases that men decide for women, so women have no say in what they want to do, what they want to say, where they want to go” (T1)

The exposure to Australian culture burgeoned in some of the women resentment and frustration at constantly having to interface the demands of contemporary Australian society while upholding traditional cultural values and behaviours at home. The
women discussed the multitude of responsibilities they had in raising and managing their families and households, as seen in the following excerpt from a 25-year-old Arab woman:

“...for us, women, depression is because our husband leave home for work early mornings and come back home too late. We take all responsibilities for looking after children and dealing with their problem.” (A1)

This excerpt highlighted the perceived role overload and concomitant psychological strain that characterised some women’s lives following migration. Although many women experience role stress and role overload, the addition of being without social support, feeling isolated, and the difficult interface between disparate cultures signal uniquely challenging circumstances to Middle Eastern migrant women. Further, some of the women who had children in school wanted their children to be literate in their first language too, in case they may come back to their original countries, reflecting the sense of instability among some of immigrants. These families therefore, sent their children both to an English school on weekdays and on weekends to a school in their first language. This was perceived to put a great deal of pressure on mothers, as they had to spend extra time and effort to help their children to meet demands of the two different educational systems, often without the assistance or involvement of their husbands.

**Language as a dimension of isolation experienced by migrant women**

Although women were enabling their children to become educated in the language of their new country, a lack of English proficiency was another source of psychological distress for the women. They experienced lessened self-esteem and increased social
isolation which caused them to feel depressed, as described in the following quote by a 42-year-old Arab woman:

“...I think my depression gets even worse when my daughter comes back from school with new English words. She then expects me to explain her meaning of the words, but I can’t...you can’t even talk about your child's progress with the teacher.” (A1)

Women found it distressing to not be able to help their children with homework or to communicate with their children’s teachers. At the same time, watching their children excel in learning a new language and merging into this new society created distance between children and parents, particularly mothers. Furthermore, being dependent on their children for communication and cultural brokering, whilst perceiving their social standing to be of limited value and recognition, was perceived as embarrassing and a source of shame.

Language discrepancies also served to restrict women’s choices and behaviours with respect to interacting with health professionals. Despite dissatisfaction with service, an inability to effectively communicate in English hindered some women from seeking alternative care. Figure 4.7 illustrates summary of perceived sources of stress by the study participants.
Figure 4.7  
Summary of perceived sources of stress by the study participants

Overwhelming stress from the above-described sources was found to besiege women’s coping strategies. Although women said that they had been trying to manage their stress by sharing their feelings with a friend, crying, reading Koran, praying and going for walks, many reported their inabilities to effectively reduce stress. Several women described stress as emanating from multiple and uncontrollable external sources. This perception of being powerless in the face of excessive psychological stress was a compelling and salient finding of this study and clearly impacted on the health and health-seeking behaviours of women. The below quote is from a 53-year-old Arab woman.

“...the main concern is stress which you can’t do anything about it” (A1)
Middle Eastern women face many barriers in reducing their risk of CVD

In addition to their discussions of the ways in which they experience stress in their lives and their inabilities to manage and reduce this stress, women spoke about how these stresses and strains directly impacted on their not engaging in healthy risk-reducing behaviours. Barriers to adopting these behaviours included financial burdens, role stress, safety fears and incompatible cultural norms of these behaviours. Of note, at the time of this study there was a xenophobic backlash at Middle Eastern peoples and even rioting, prompted by isolated sexual assaults. These feelings had been surfacing since, at the time of data collection there was a high degree of racial tension directed towards people from the Middle-East.

Summary of the barriers to CHD risk reducing behaviours among the study participants are presented in Figure 4.8.

The women believed financial issues to be an important factor in adopting healthy behaviours, such as eating healthy food, undertaking physical activity and losing weight. However, they were not in the financial position to purchase these goods and services. The women found it hard to undertake physical activity alone, such as walking on local streets or exercising within their homes. Group gym-based exercise was preferred, but was perceived as unaffordable and otherwise unrealistic for some of the women who had young children to care for throughout the day as expressed in the following excerpt from a 36-year-old Persian woman:

“...I thought I should pay gym 70 dollars per month? Plus who would look after my kids? So, I persuaded myself to do exercise by myself and burn my fat by walking to (train) station, but I neither went to gym nor walked by myself”(P2)
In addition to some women finding it hard to venture out of their homes and exercise by walking through their neighbourhoods, fears of religious persecution and racial discrimination featured as a cause of stress and a reason to avoid walking outside. This was particularly a concern for the women who wore Islamic dress. They perceived a higher risk of encountering violence or intolerance. When this concern emerged with the focus group discussion, women shared stories about their personal experiences of walking outside which included being verbally abused or otherwise threatened by motorists, as in the following excerpt from a 54-year-old Turkish woman:

“...an Afghani woman who used to walk early in the mornings was killed last year and also another Turkish lady was killed somewhere else” (T3)

The women who had directly experienced threats or who had heard of others’ experiences had decided to no longer walk on streets, further restricting their access to the external world, particularly if the women were not able to drive themselves.

Although some women reported this fear of abuse while undertaking exercise in public, some of the women explained that exercise, such as walking and riding a bicycle on the streets were culturally inappropriate for women, as were co-ed gymnasiums and swimming pools. The women expressed their dissatisfaction with lack of availability of culturally appropriate exercise venues, such as female-only fitness centres and swimming pools. In fact, cultural considerations impeded most of the women in some way from adopting healthy lifestyles. Cardiovascular risk-reducing behaviours in women seemed highly influenced by their husbands’ beliefs and attitudes toward these behaviours. For example, support or perceived subliminal messages from husbands and significant others emerged as an important factor in
women’s weight loss or maintenance. Men’s attitudes and beliefs toward physical activity also influenced women’s decisions to undertake physical activity, as seen in the following excerpt:

“...when you tell them (men) I wanna go to gym, your husband says it doesn’t make sense you go gym and jump up and down there...you can do it at home” (P2)

In this excerpt, if the husband doesn’t understand or value the wife’s attendance of an exercise facility, she will not undertake this activity. Some women explained that some people did not prioritise certain health behaviour expenditures, as they did not perceive an urgent need unless an undesired health outcome appeared, implicating the underscore of prevention programmes.

Further, there was a strong perception about the difficulty of convincing men from older generations, in particular, to change their lifestyles or to support their wives who were trying to adopt a healthy lifestyle. Women from older generations perceived difficulties in taking health professionals’ advice on changing their lifestyle and adopting healthy ways of living. In instances where the women obtain advice to avoid salty or oily food, they had to cook for themselves and the family members separately. This was perceived as frustrating and very time consuming and resulted in not sustaining the recommended diet. This finding may have implications for health professionals to consider the important role of men and significant others in practising risk-reducing behaviours in Middle Eastern women. Results on quantitative data were compared with results on qualitative data using matrixes The capacity to link the survey data to the focus group data has provided not only validation but illumination and confirmation of the issues influencing the risk perception of women and their explanatory values.
4.6 Discussion

Challenges in research on minorities, such as ineligibility of minorities due to language restrictions, lack of valid and reliable instruments, financial considerations, lack of trust by the minorities and subsequent refusal to participate in studies have resulted in low representation of minorities in research. This is in contrast to involving people and consumers in research to develop culturally appropriate prevention programmes and strategies which best meet the health concerns and priorities of these population and might differ from health professionals and health
researchers’ perspectives.\textsuperscript{268,359} Taking into account these challenges and in the light of scarce data on CHD risk perceptions in diverse cultural communities, this study has given a voice to Middle Eastern women who are traditionally difficult-to-access, to be able to articulate their own concerns and speak on their own terms. The findings of this study indicate that the perceptions of CHD risk are not only mediated by the stereotypes attributed to gender but also influenced by the ethno-cultural experiences of women. The social roles and expectations of women within the context of their culture and the impact of migration appear to have impacted on women’s perception of risk of CHD and their capacity to engage in positive health seeking behaviours. Tailoring interventions to meet particular health needs of diverse ethnic and cultural groups in order to improve cardiovascular health outcomes needs gaining an in-depth understanding of peoples’ perception of CHD risk and engaging the target community members in the process of designing, implementing and evaluating of the interventions.

### 4.6.1 Estimated absolute CHD risk of the participants

The results of the study showed that the majority of the participants were at increased risk of developing CHD. The high prevalence of $\text{BMI} \geq 25 \text{ kg/m}^2$ and waist circumstance $\geq 80 \text{ cm}$, as the root cause of metabolic syndrome, is an issue of concern, particularly for women.\textsuperscript{21} Of particular importance is the higher prevalence of $\text{WHR} \geq 0.80$, which is considered a better predictive of CHD risk in women than BMI and waist circumstances.\textsuperscript{70} These findings are even more concerning when compared with national data. According to Australian Institute of Health and Welfare,\textsuperscript{360} 47% of women (aged 25 years and over) in 1999-2000 were overweight or obese, compared with 83% in this study. Globally the prevalence of overweight and obesity has increased and significantly contributed to development of CHD.\textsuperscript{361}
Consuming oily food which is highly culture specific and having a sedentary lifestyle due to urbanization and acculturation were mentioned by the participants as the reasons for their obesity. A large number of the participants did not have sufficient physical activity to gain cardiovascular health benefits, according to the national physical activity guidelines for Australians. Physical inactivity is an important risk factor in many diseases, such as cardiovascular disease, type 2 diabetes, cancer, osteoporosis, bone fractures, falls, mental illness and obesity. The Australian Institute of Health and Welfare (AIHW) raises concern about lack of sufficient physical activity among Australians and reports that 54.8% of Australian women do not have sufficient physical activity. Compared with the national average, the high percentage of inactivity (79%) in the study participants is of concern. These findings have implication that prioritisation of physical activity as national research area in Australia should also ensure involving minority women, particularly Middle Eastern women in research. The cultural emphasis on modesty of women impedes many women to be engaged in physical activity provided in the conventional cardiac rehabilitation centres, gyms, or in public, finding that have consistently been reported in the literature. Providing culturally competent safe facilities, such as female specific gyms or indoor swimming pools may increase physical activity among these women.

The CHD risk factor profile of the study participants, augmented by lower socio-economic status put the participants at increased CHD risk. It has been well documented that socio-economic status affects development and prognosis of CHD and is negatively associated with other CHD risk factors including obesity, smoking, physical activity, hypertension and diabetes. All the participants in this study had at least two and a large number (74%) had at least three CHD risk factors including
older age, high blood pressure, BMI $\geq 25$, WHR $\geq 0.80$, inactivity, smoking, family history of heart disease and psychological distress. Unfortunately the blood cholesterol level and diabetes status of many participants were not included, as many of the participants refused to undergo the laboratory tests. The high risk factor burden among the study participants increases their absolute risk of developing cardiac events in future. Framingham study data revealed a higher risk and lower survival in those with intermediate or high risk factor burden at 50 years of age while the absence of established risk factors at 50 years of age was associated with a very low risk for cardiac events (8.2% versus 50.2% in women) and longer survival (>39 versus 31 years in women). Furthermore, the non-laboratory–based method used to estimate the absolute risk confirmed that many participants were at increased risk of CHD, underscoring the importance of primary prevention interventions targeting this particular minority group. Similarly to the Framingham risk score, the non-laboratory–based method does not take into account some CHD risk factors, such as family history of the disease and physical activity and may underestimate the absolute CHD risk in the participants.

The higher CHD risk in the participants, in addition to their lower socio-economic status and higher reporting of psychological distress could preventive efforts and the adoption of positive lifestyle changes. Further, awareness and understanding of CHD risk and the perceived susceptibility to the risk as well as the impact of cultural factors in shaping these perceptions are important factors and should be taken into account in developing appropriate interventions to reduce CHD risk in this population.
4.6.2 Awareness and perception of CHD risk in the study participants

Consistent with published findings, participants in this study were not aware that CVD is the first killer of women and commonly considered that women often died of cancer. Yet, more participants reported having somebody from their immediate family members who had had a diagnosis of heart disease than cancer. Only 12 (21%) participants were aware that CVD was the first killer of women in Australia in this study while in 2000, 12,469 Australian women died from CHD, 5 times as many deaths from breast cancer. Further, some participants (31%), underestimated the CHD risk in younger and middle aged population and thought that heart disease pertained primarily to those over the age of 65 years. The awareness of burden of CHD in women was not related to education level of the participants and their length of residence in Australia, stressing the inaccessibility of health information to non-English speaking immigrants, regardless of the prevention-oriented health system of Australia. Further, the literature indicates that although there have been some improvement in addressing awareness of CHD in women in the United States as the result of national campaigns, the less educated and ethnically diverse groups have made substantially less improvement in knowledge, implicating that investigating this important health message within a cultural context is of critical importance. It seems that cardiovascular health information available for the public either is not necessarily sufficient or not tailored to meet the needs of women, particularly those from diverse culture and language. Although the study participants demonstrated some understanding of heart disease, some misconceptions regarding risk factors, strategies to alleviate chest pain and deterrence of the potential heart attack were demonstrated. These misperceptions may interfere with decisions to seek care or delays in presentation to health
professionals and should be taken into account when designing CHD risk reduction interventions for this population group. Freeland\textsuperscript{371} discusses that individuals who lack any scientific understanding of their condition fill in the gaps with unclear explanations, misperceptions and superstitions resulting in maladaptive health behaviours. The limited of knowledge and awareness about heart disease may also justify beliefs, such as fatalism among some participants.

Consistent with the literature,\textsuperscript{220, 230, 244, 372} the participants, particularly younger women, underestimated their personal absolute CHD risk. They perceived that psychological distress was the main health concern of women. These findings are similar to findings reported by Hispanic women who also perceived stress as the greatest health problem facing women.\textsuperscript{220} In this study, participants in general and particularly Arabic women did not perceive themselves at increased risk of CHD. Further, participants’ perception of their CHD risk was not in congruence with their estimated absolute risk. A greater concern is that the majority of the participants (71%), at high risk of developing CHD, underestimated their risk while 33% of participants, at low risk, overestimated their CHD risk. Underestimation of one’s personal risk and a lack of congruence between perceived and actual CHD risk has widely been documented in the literature.\textsuperscript{185, 260} Mosca et al.\textsuperscript{47} reported that 13% of American women perceived themselves at CHD risk in 2005. Other study reported that about one half of women at low risk and two thirds of women at moderate or high risk of CHD accurately perceived their risk level.\textsuperscript{185} Further, many participants perceived their CHD risk to be lower than their peers. Others have replicated these findings.\textsuperscript{111, 219} These findings reflect that fear-provoking stimuli may provoke defensive reactions and adversely impact on health intentions and behaviours and
have implications that threat massages should be presented in an optimistic manner and improve self efficacy and response efficacy.\textsuperscript{373}

Although perception of CHD risk was not associated with education level, highly educated participants demonstrated a more favourable risk factor profile than participants with lower education levels. Highly educated participants were less likely to be smokers and psychologically distressed than those with lower levels of education.

Twenty three percent of the participants underestimated the risk factors of high systolic blood pressure. This also has implications that the participants may have under-reported their history of diabetes, which was used to calculate the 5-year CHD risk of the participants. This means that the estimated absolute CHD risk of the participants is likely to be underestimated in this study. Findings of this study underscore the importance of reducing the gap between absolute and perceived risk in Middle Eastern women. Risk assessment for CHD and the use of effective communication of CHD risk can assist women in developing a more realistic perception of risk that, in turn, may trigger off risk reducing behaviours.\textsuperscript{185} Although assessment of CHD risk and detection of risk factors on an individual level and initiating aggressive interventions for high risk groups help to reduce the burden of CHD at community levels,\textsuperscript{374} the success of these interventions will largely depend upon individuals to take more responsibility to reduce their individual risk.

Awareness of personal CHD risk factors, such as cholesterol, diabetes, or family history of heart disease have been associated with an increased perception of personal CHD risk.\textsuperscript{245, 248} Although knowledge dose not necessary lead to behaviour change,\textsuperscript{375} awareness of one’s own risk factors has been identified as a vital step in prevention and management of CHD.\textsuperscript{7} Findings from 84,129 women participating
the Nurses' Health Study concluded that adherence to lifestyle guidelines involving diet, physical activity and abstinence from smoking is strongly associated with a low risk of CHD. Therefore, culturally and linguistically competent educational counselling services which included these factors have capacity to reduce CHD risk among Middle Eastern women. Helping women to have a clearer understanding of their risk of CHD is considered a key strategy in motivating people to engage in affirmative health-promoting behaviours to improve cardiovascular health. In this study, obese participants perceived a higher absolute CHD risk in the next 10 years than non-obese participants, although their perceived risk in short period of time (5 years) was not statistically different from non-obese participants. Similarly, participants with a family history of heart disease perceived a higher absolute CHD risk in the next 10 years, however, their perceived risk in short period of time (5 years) was not statistically different from participates without a family history of CHD. In other words, obese participants and those with a history of heart disease did not necessarily perceive themselves at CHD risk in short period of time. These perceptions may hinder timely actions to reduce CHD risk.

### 4.6.3 Causal attributions for CHD

When participants were asked to rate their casual attribution to CHD in general, the most highly attributed risk factors were psychological distress, obesity and physical inactivity. Participants also attributed highly to smoking, poor food, high blood pressure and heredity. These findings were confirmed both in the survey results and findings from the focus groups. The excessive stress attribution among the participants is an issue of concern. Although a systematic review of the literature shows that chronic stress and lifestyle factors are the two most common casual attributions for heart disease, participants without documented CHD are more likely
to attribute to lifestyle factors, such as obesity and high blood pressure compared to patients with CHD who attribute to stress, fate, or luck.$^{143}$ Further, the emerging literature from developed countries, such as the USA, indicates that increasingly individuals give greater weight to medical factors, such as obesity and hypertension$^{143, 378, 379}$ while stress still is the most common reported causal attribution among minorities and participants from developing countries.$^{87, 380}$ This potentially demonstrates the effectiveness of accessible health information in improving accurate causal attributions.$^{274}$ French argues that casual attribution to stress which comes from uncontrollable external sources is an important factor and may justify adoption of a passive role by individuals in reducing their risk.$^{143}$

Belief in stress as the main culprit for developing heart disease among the study participants may be partially due to the high levels of stressors evident among the participants. Stress was found to be a pervasive and permeating factor in the participants’ life. Findings of the focus groups demonstrated a profound effect of immigration on psychological status of the study participants. Women also felt ‘different’ and often ‘alone’ within the mainstream culture and also felt vulnerable to the threats of prejudice and racial tensions. At the time of the data collection, there were racially motivated riots with attention focussed on Muslims.$^{358}$ Adapting and managing social changes and cultural expectations were perceived highly stressful, findings which have been supported by the previous research.$^{81}$ Nahas et al.$^{81}$ who studied postpartum depression among Middle Eastern women migrants in Australia, reported that most participants expressed a deep sense of loneliness due to isolation and lack of social support. They missed the support that they got from their own families, friends and even neighbours. In Australia, they are often left alone at home to look after the children while their husbands go to work.$^{81}$ Middle Eastern
immigrant women also experience social isolation due to cultural alienation.\textsuperscript{81} Further, a higher level of psychological distress among Iranian immigrants (37\%) have been reported by Khavarpour and Rissel.\textsuperscript{80} The majority of the participants in this study believed that the migration process had been stressful, either under the circumstances of their departure or subsequently in their ability to resettle without socio-cultural support.\textsuperscript{80} The participants believed that these factors affect their health including heart health. Effects of social support on cardiovascular reactivity can be explained. For example, Kamarck et al.\textsuperscript{381} reported lower BP and HR reactivity to mental stress for women who were with a friend than women who were alone during the test.\textsuperscript{381} Strong social ties may affect neuroendocrine and cardiovascular functioning or significant others may encourage the adoption of healthy behaviours and support utilisation of medical services.\textsuperscript{259} Wilson et al\textsuperscript{259} studied gender differences in preferences for different types of support and reported that emotional support was more important to women than instrumental support. Immigrants have to deal with many stressors, such as resolving financial issues and adjusting to the norms, mores and language of the host country.\textsuperscript{382, 383} The higher prevalence of psychological distress in Iranian,\textsuperscript{301, 384-386} Turkish\textsuperscript{302, 387, 388} and Arab immigrants\textsuperscript{389, 390} have also been widely documented in the literature. In a study that assessed depression and psychosocial stressors in Iranian immigrants in Germany, as high as 50\% of the participants met the criteria for a depressive disorder.\textsuperscript{384} Further, perceived family role responsibilities and family conflicts were found to be a source of stress for the study participants. In the Middle Eastern culture, a woman is viewed unfavourably if she is not perceived to be taking care of her husband and children properly.\textsuperscript{81} Migrant women found that they can have rights equals to men, in
Australia, resulting in family conflicts. There is evidence that women who report high spousal care time commitment and less social support experience significantly higher depressive symptoms, compared to women with no spousal care responsibilities and good social support.\textsuperscript{391}

The increased prevalence of psychological distress among the participants may also be partially due to their low socio-economic status. In this study, participants with lower education and unpaid employment reported significantly higher symptoms of depression, anxiety and stress than participants with higher education and paid employment. These findings support the results of previous empirical studies.\textsuperscript{392-394} For example, a study on Turkish immigrants living in Canada showed a strong positive relationship between socio-economic status and psychological well being, with participants from higher socio-economic status having better psychological health.\textsuperscript{393} Similarly, Khavarpour and Rissle\textsuperscript{80} who studied psychological wellbeing of migrant Iranians in Australia found that migrants who had paid employment showed better psychological adjustments.\textsuperscript{80} Some argue that immigrants from higher socio-economic status are more likely to find the necessary resources to be used with the demands of their new lives.\textsuperscript{302} These women may also benefit from social support and are more likely to use available mental health services.\textsuperscript{395,396} Perceived better psychological health by women in paid employment may also be related to some rewarding aspects of having a job, such as being able to accomplish a specific task leading to a pre-perceived higher self esteem and independence.\textsuperscript{394}

The perceived high stress also seems to be inherent to gender or culture. There is evidence that Turkish people have a propensity to attribute stress to many diseases, such as cardiovascular disease, cancers, ulcers and even tuberculosis.\textsuperscript{177} Turkish women often attribute family conflicts and pressures as a cause of psychological
problems, stressing the significance of the family and the reciprocity of the individual and the family in this Turkish culture.\textsuperscript{177} Culturally competent interventions directed toward social resources may help immigrants cope with family stressors and modify patterns of maladaptive acculturation.

The higher prevalence of psychological distress in immigrants in general and the study participants in particular is an issue of concern, given that increasingly more studies report the association of psychosocial risk factors with the development and prognosis of cardiovascular disease.\textsuperscript{77, 397-399} The INTERHEART study\textsuperscript{71} showed that feeling sad, blue, or depressed for 2 weeks or more in a row was related to AMI across diverse ethical groups. Although the high prevalence of psychological distress among the study participants is in itself an adequate reason for attention, of importance is the impact of psychological status of the participants on their causal attributions. There was found a strong association between depression, anxiety and stress levels of the participants and a tendency to believe that one’s heart disease could be caused by negative emotions. Stress attribution is often higher in those who are psychologically distressed.\textsuperscript{254, 398, 400} Day et al.\textsuperscript{398} found that cardiac patients who were depressed or anxious were more likely to attribute their disease to negative emotions including depression, anxiety and stress. In another study, negative moods were associated with tendencies to attribute negative events to factors that are self-blaming, affecting many aspects of life and unchangeble.\textsuperscript{401} Nevertheless, few studies have examined the associations between psychological distress and causal attributions in non-patient samples. Inaccurate causal attributions may delay care-seeking behaviours. Cameron et al.\textsuperscript{402} reported that stressful events promote attribution of symptoms, with participants with a stressful event being more likely to attribute symptoms to stress than illness and delay seeking for help. In this study,
participants with higher depression, anxiety and stress scores were also more likely to attribute to external causal attributions, such as migration. These findings were also supported by the focus group data. The existing literature shows that attributions to lifestyle factors are associated with a greater change in risk behaviours while those who attribute their disease to factors beyond their control, such as heredity and stress, which is common among women, demonstrate maladaptive behaviours, according to Weiner’s theory. In a study, women were less likely than men to report improving their diets or increasing physical activity and it was found that initial causal attributions were related to the subsequent behaviour change in relevant risk factors. These findings underscore the importance of assessing and accreting individuals’ belief about the causes of heart disease.

Psychologically distressed participants in this study tended to play down the importance of reducing CHD risk. It seemed difficult for these participants to make their future cardiovascular health a priority and perceived the current psychosocial fulfilsments as superiority. Findings of this study confirm other research that immigration is stressful and can have an adverse impact on health, potentially aggravating imprecise perceptions of CHD risk.

The inaccurate causal attribution and giving more weight to stress as the cause of CVD may result in failing to notice the important role of the other CHD risk factors, such as hyperlipidemia, diabetes and hypertension and interfere with risk reducing behaviours. The lower causal attribution to diabetes and menopausal status are alarming, given the major contribution of these risk factors in development of CVD in women, and the high rate of diabetes among this population. For example, in 2001, Middle Eastern women had a diabetes prevalence of 2.4 times that of Australian-born females. Further, the increasing prevalence of diabetes globally
calls for enforcing national efforts to improve health literacy concerning CHD risk factors, particularly diabetes. The under-acknowledgement of diabetes and post-menopausal status as contributing factors to CHD by women has been widely documented in the literature.  

These findings have implications that health professionals should consider causal attributions in their clients, discuss their erroneous health beliefs and negative perceptions, particularly in depressed or anxious patients, and assist them to attain a better understanding of heart disease and associated risk factors. Focus group data revealed that although doctors were found to be highly respected in Middle Eastern culture and can take a significant role in cardiovascular primary prevention, they did not seem to discuss CHD risk and risk factors with their clients, particularly with women. Further, surprisingly doctors appeared to contribute a lot in stress attribution among this population group. This finding is also consistent with results reported by Sahin-Hodoglugil showing that doctors shared the view that sadness could cause many diseases and even recommended smoking to relieve sorrow and stress in their clients. Helping Middle Eastern women to perceive the global and cumulative nature of cardiovascular disease is another important issue and can help them to also consider the contribution of other CHD risk factors, which play more important role in developing CVD in women, such as diabetes, high blood pressure and smoking. Culturally competent primary prevention in the form of education regarding the burden of the disease and its risk factors, screening for the CHD risk factors and treatment of decreasing blood cholesterol and blood pressure, blood pressure and cholesterol level screening, and preventing obesity and type 2 diabetes is essential. Accessible health information, screening and effective interventions are accredited as vital steps toward forming healthy lifestyle habits that can be carried through life.
Culturally and linguistically competent health promotion materials appear to be helpful when delivering health information to culturally and linguistically diverse population and should be further tailored to addressing CHD risk.\textsuperscript{1, 409, 410}

The cumulative disadvantage of low levels of education, socio-economic status and high risk factor burden, potentially compounded by the stress of migration are important factors to consider in developing community health interventions for Middle Eastern women. These findings also have implications for public health policy and research. Understanding the process of immigration, how it is related to factors, such as acculturation stress, and how psychological problems are presented in diverse cultures is a vital step in understanding mental health adjustment and could lead to development of more effective preventive models in immigrants. The high level of depression, anxiety and stress has implications that Middle Eastern women do not receive appropriate mental health support. Although there are a number of websites, such as beyondblue.org\textsuperscript{411} and depression doctor .com\textsuperscript{412} designed to increase public awareness of psychological distress, the lack of a culturally and linguistically competent mental health programme could impede uptake of the services by diverse population including Middle Eastern Women. To reduce the burden psychological distress not only mental health services should be accessible and affordable,\textsuperscript{413} also they should be provided within a culturally competent context. Cultural beliefs and attitudes towards psychiatric illness profoundly influence presentation and detection of these disorders and should be taken into account when designing mental health programmes for diverse cultural groups.\textsuperscript{414, 415} It is important to explore the conceptualisation of depression and the impact of this conceptualisation on treatment seeking behaviours in this population. Middle Eastern women may be reluctant to report symptoms of depression or consult a doctor about
depression, because of the social stigma that often accompanies psychological disorders. Cultural beliefs also affect individuals’ acceptance and adherence to the recommended mental health treatments. Findings of the study focus groups demonstrated the significance of sociability/social isolation in mental health/illness of the study participants, findings which are supported by the past research. Using a representative sample of 707 participants, Ozmen et al. reported that people in Turkey appreciated the benefits of psychological and social interventions more than pharmacotherapy and medicines which they perceived as harmful and addictive. Culturally competent mental health approach should take into account these cultural barriers and do not withhold alternative treatment options due to one’s reluctance to use antidepressants. Similar to findings in this study, Ozman et al. reported that participants showed an interest in involving themselves in programmes where they had the potential to engage in social activities. This is of particular importance given that psychologically stressed and anxious participants in this study appreciated the benefits of physical activity in cardiovascular health. Yet, it is imperative to consider both physiologically beneficial effect and acceptability and feasibility of physical activity options. Interventions that increase sociability are more likely to improve mental health of Middle Eastern of women, such as physical activity in the form of group walking. In designing health interventions for Middle Eastern women it is therefore important to consider the impact of peer group on commencing and maintaining a given health programme, such as physical activity.

### 4.6.4 Barriers to risk reducing behaviours

Findings of this study showed that some personal, environmental and cultural barriers appeared to hinder the participants to decrease their risk. The conceptual model of the study (see Figure 2.5) informed the process of the Middle Eastern
Women Study including data collection and data analyses. The conceptual model also guided interpretation of the findings on CHD risk perception and facilitating/impeding factors to risk reducing behaviours. Findings from this study can assist health professionals to explain the under-utilisation of primary and secondary CVD prevention programmes in Middle Eastern population as well as reasons for non-adherence to medication regime and recommended lifestyle changes. Evidence based interventions have the capacity to facilitate risk reducing behaviours in people at risk or with established CHD. Considering socio-cultural factors influencing perception of risk and risk reducing behaviours could also provide strong foundations to improve the design of interventions to increase the likelihood of individuals from diverse cultures adopting and maintaining risk reducing behaviours.\(^{191,202}\)

In this study, barriers to adopting a heart healthy lifestyle were found to be consistent with the literature, but some were inclusive to participants in this study. There was not a real sense from the participants, both from quantitative and qualitative, demonstrating that they were actively engaged in affirmative cardiovascular health behaviours. The risk reducing behaviours were limited to attempts to undertake physical activity and watching diet, such as avoiding oily food, processed food and red meat. Limited knowledge and awareness of CHD and the burden in women and perception that CHD may hinder engaging in CHD risk reducing behaviours among this population and is consistent with the literature.\(^{111,219}\)

In addition to the lower education status of the study participants, inadequate health literacy, which refers to lack of skills needed to read, understand and act on basic health care information\(^{416}\) is a barrier that comprises the ability of Middle Eastern Women to understand health information\(^{152}\) and often overlooked and underemphasised in minorities.\(^{152,416}\) Inadequate health literacy has been related to
increased cardiovascular death and it is vital for CHD prevention to increase
cognitive outcomes, such as knowledge regarding the burden of CHD and an
accurate risk perception among public including minorities. Women in this study
found health messages inaccessible and described cardiovascular health information
to be very general, unclear and impractical. Further, language barriers impeded the
accessibility of mainstream health information. Consist with this finding, Middle
Eastern migrant women Nahas et al.’s study reported that they received inadequate
or conflicting information about prenatal and postnatal care. Language barriers also
hindered an effective communication with health providers, a problem that people
from diverse language groups are encountered with and this may partially explain
why peers were reported as the major source of health among minorities. Evenson
et al. reported lack of English language skills as a factor in developing fatalistic
beliefs among first generation Latino immigrants and a barrier to being physically
active.

Another factor which may help public to gain knowledge about a given health threat
and achieve a reasonable risk perception is exposure to mass media which also
promotes self-efficacy and response-efficacy. Language barriers may further
hinder the use of these facilities by diverse language groups. Inaccessibility of health
information, low health literacy and socio-cultural factors can partially explain
inaccurate causal attributions in the participants. Belief in stress as the main cause of
CHD, an external and uncontrollable causal attribution, can also impede actively
engaging in risk reducing behaviours. External causal attributions has been
associated with decreased expectancies for future improvement, a lower response
efficacy and beliefs that nothing can be changed. In a study, stress reduction
strategies were adopted over life style changes, such as smoking cessation or
physical activity, as participants believed that stress was the main cause of their MI.\textsuperscript{419}

There is a significant opportunity for healthcare providers, particularly from the same culture and language to take the lead as the primary source of information for women in their community.\textsuperscript{267} Health providers should take special care to communicate clearly with patients from non-English background and those with lower levels of health literacy.\textsuperscript{167} The mismatch between lay and professional perspectives often results in misunderstandings, misperceptions and patients’ dissatisfaction with treatment.\textsuperscript{152} This was also observed among Middle eastern women in this study. No association between the perception of personal CHD risk and personal and family health history including heart disease and cancer were found in this study. These findings are inconsistent with the past research which report that people with a family history of heart disease perceive higher perception of CHD risk,\textsuperscript{226} and those with a family history of cancer underestimate their risk.\textsuperscript{255} A correct understating of personal risk factors and perception of susceptibility to CHD risk facilitates making lifestyle changes to reduce their risk.\textsuperscript{216} In a study, a large number of the participants reported that they would be very likely to change their lifestyles if they were aware of their risk.\textsuperscript{220} These findings signals the need to address effective CHD risk communication methods to improve an accurate perception of risk which, in turn, smooths the progress of risk reducing behaviours in high risk groups.

Some participants attempted to justify their negligence of adopting heart healthy behaviours by underestimating the risk, having attitude ambivalence toward some risk factors, such as smoking and believing in fatalism. Feelings such as fatalism toward control over risks or a belief that scientific development which are culturally shaped and are important factors in perception of risk and risk reducing behaviours.
A belief that individuals are incapable of controlling over predetermined events is common in Middle Eastern culture, and can influence attitudes and practices toward diseases impeding positive risk reducing behaviours among this population. These adverse perceptions may reinforce adverse and maladaptive health behaviours. Anderson reported that women who were not engaged in risk reducing behaviours mitigate their perceived risk through strategies, such as rationalising and fatalism. Whether fatalistic attitudes lead to lower levels of engaging in risk reducing behaviour or those who are not engaged in these practices tend to justify their ignorance by taking fatalistic view is not clear. However, there appears to be an association between these two factors. Health professionals, particularly from the similar cultural and language background, are in a unique position to provide preventive care and effectively communicate CHD risk with clients. Health professionals should consider ethno-cultural causal attributions in their clients, discuss erroneous beliefs and negative perceptions, and assist people to obtain an accurate understanding of CVD and associated risk factors. Risk information which are designed, tailored and communicated properly to the needs of diverse groups in society can be of crucial importance in improving risk perceptions.

According to the study conceptual model (see Figure 2.1) an accurate perception of risk is only one of the many factors influencing risk reducing behaviours. Self efficacy and response efficacy are also important factors. Some participants who had the risk factors of obesity, inactivity and psychological distress (actual risk) and also attributed highly to these risk factors (accurate perceived risk) reported a lack of confidence and competence to reduce the risk. The dissonance between the perception of risk and taking an action to reduce risk requires considering barriers,
such as low self efficacy and a lack of practical knowledge. The individual’s confidence and belief in being able to employ risk reducing techniques can influence their adoption of and adherence to the related health risk reduction behaviours, which can also influence their psychological adjustment. \textsuperscript{375} Further, participants who reported to be engaging in some level of CHD risk reducing behaviours, such as modifying their diet and increasing physical activity, were not sure of what healthy eating actually means and did not know to check for food labelling such as the Heart Foundation’s tick sign to choose healthy food options. In addition, they were unsure about the physical activity recommendations and perceived housework as being equivalent to doing exercise, findings that support results from Sahin-Hodoglugil’s study on Turkish population. \textsuperscript{87} These findings underscore the significance of accessibility of clear, practical and culturally and linguistically tailored health information. Particularly older and less educated participants in this study did not appear to value and practice CHD prevention measures, such as screening for blood pressure and blood cholesterol levels, consuming healthy food and taking a physically active lifestyle until their condition got critical. They were more likely to have fatalistic attitudes toward their health and less likely to be engaged in heart health behaviours. These perceptions appear to be related to their cultural and religious beliefs and socio-economic factors. Of note, affluent Muslims tend to believe that God helps those who help themselves while the poor believe that their condition was God’s will.\textsuperscript{87, 422}

Further, many participants in this study refused to have their cholesterol or blood sugar level checked and reported the fear of the consequences as the main reason for their refusal. This fear of adverse consequences also impeded early help-seeking for symptoms of heart disease, such as chest pain in some of study participants. This
observation is important as they may impede receiving definitive timely treatment and has important implications for prevention, early intervention and treatment of CHD. For example, Moser et al.\textsuperscript{126} found that fear of the consequences of seeking help was a reason for increased pre-hospital delay. Some participants mentioned family roles and responsibilities and lack of time for their refusal of screening tests. It is also likely that some of participants did not perceive the importance of the screening test. It should also be noted that immigrants, particularly from developing countries are coming from countries where the health care system is predominantly treatment-oriented, rather than prevention-oriented and thus these immigrants may do not understand overall concept of prevention and resist preventive measures.\textsuperscript{291} This requires health providers to spend more time and effort to clearly discuss the significance of CHD preventive measures and cardiac rehabilitation programme.

It is also important to understand cultural differences in adopting the beliefs and behaviours of another group (acculturation) and the impact of immigration and acculturation on physical and psychosocial health, particularly among first generation immigrants. Immigration and acculturation can influence accessibility to health services, risk perception, health behaviours, the use and trust of health care systems and self efficacy.\textsuperscript{150, 423} Dealing with family obligations, the expense of child care, a lack of support from family members, particularly husbands, and cultural expectations as barriers to CVD health behaviours should be considered by health professionals in both their interactions with clients and program development.\textsuperscript{380, 424} Some cultural and financial considerations force women to ignore their personal health needs, prioritise family needs over their own, and stay dependant on men’s decisions for health expenditure, seeking help for their health and adopting a healthier lifestyle. Given that men, particularly from older generations are often
dominant in making health decisions for the family in Middle Eastern cultures including women,\textsuperscript{425} considering men’s attitudes toward risk reducing behaviours are important, although patriarchal social structures may vary across the Middle East and between social strata.\textsuperscript{175} This highlights the importance of involving men from Middle Eastern culture in planning health interventions for women. An enabling feature of Middle Eastern culture is the family. Family can be a great source of support, if the importance of risk reducing behaviours is clearly understood.\textsuperscript{153} Middle Eastern women also need to be empowered through education and financial independence to actively engage in their health decision makings. Lower socio-economic status appears to have a greater effect on cardiovascular disease risk, CVD outcomes, and risk reducing behaviours among women than men.\textsuperscript{232, 426, 427} Considering that many women, particularly from older generations, were found to be dependant on men financially, the affordability of health programmes seems also to be an important factor. There is evidence that income plays a role in the type of health-promoting behaviours engaged in by women, with wealthy women being more involved in cardiovascular risk-reducing behaviour, such as diet control, physical activity and weight management while lower-income women participate in walking.\textsuperscript{367} As women become educated, find a job and increase in financial independence, they are more engaged in making health decision for themselves. The employed participants in this study were more likely to believe that engaging in risk reducing behaviours that could reduce their CHD risk. Further, cultural issues such as an emphasis on values and family honour and modesty impeded many women from engaging in physical activity characteristic of mainstream programs.\textsuperscript{428, 429} Individually and collectively these factors seem to impact on women’s perception of their CHD risk and the readiness and capacity to take an active role in reducing their
risk of CHD. Further, the failure of health care organizations to provide linguistically and culturally competent health care to diverse racial, ethnic and cultural populations is an important contributing factor to health inequality. This inequity can be exacerbated among ethnic, racial and cultural groups where socio-economic disadvantage contributes to inferior health outcomes. These issues can be addressed by enabling policies and promotion of these matters among health professionals.

Providing culturally competent safe facilities, such as female specific gyms or indoor swimming pools, may increase physical activity among these women. In designing health interventions for Middle Eastern women it is also important to consider the impact of peer group on commencing and maintaining a given health program, such as physical activity. Women showed an interest in participating in programs where they had the potential to engage in social activities. Community centres seemed to have a good potential for the communicating of health information with culturally and linguistically diverse populations. Tailoring heart health messages and programmes to meet the needs of minorities has the potential to increase health service utilisation, improve health outcomes and reduce CVD health disparities.

Health professionals and health researchers should pay attention to social class of the participants, as they do not necessarily mix in the same locations.

4.7 Limitations and strengths of Study One

One limitation of the study is the inability to generalise the finding because of the study design and sampling issues. Thus, the findings from this study can not be generalised to all Middle Eastern women. Further, in the absence of validated measurement instruments which completely fit the study aims, some investigator-developed questionnaires were used to collect information from the study.
participants. In addition, data on perception of the risk of CHD, perception of risk factors, levels of self efficacy and response efficacy were collected using a Likert type scale. It should be noted that in some cultures even widely accepted instrumentation may be not valid. For example, Lee et al. identified a variation in responses to Likert scales in Chinese, Japanese, and Americans recruited to a study to investigate social coherence. It should also be considered that people may have different scale use habits. Some tend to use the high end of the scales while others tend to use the low end of the scale. However, convergent validation of the findings boosts the credibility of the findings, an advantage of using mixed methods.

The exploratory nature of the statistical analyses is noted and the limitations acknowledged, particularly those associated with multiple comparisons. However, as outlined in the previous chapters the pragmatic and methodological issues of this type of research are challenging. This study has provided useful observations to be tested in future intervention studies.

The study applied the non-laboratory–based method to estimate absolute CHD risk of the participants, participants, largely because of women’s reluctance to undergo venepuncture. This method has been developed based on the Framingham cohort, white middle class men and women, aged 30-74 years, living in semiurban Massachusetts, and may not accurately estimate the risk of CHD in ethnic minorities including Middle Eastern women. This study did not aim to use the risk estimates to implement primary prevention therapy or take an action according to the level of absolute risk of the participants, but to compare this estimation with the perceived risk of study participants. The researcher also relied on the participants’ self report of taking medication for blood pressure, cholesterol, and diabetes. This information was used to determine the risk of high blood pressure, high blood cholesterol, and
diabetes in study participants. Therefore, accuracy of the participants in reporting their medications could affect the results. In many instances, women had a limited literacy, even in their own language and reporting these measures through an interpreter may also potentially limit the validity of findings.

It is also important to note that Study One assessed the participants’ casual attributions to heart disease in general. Different results might have been yielded if the questions specifically targeted the participants. Attributions that people make about their own disease has been shown to be different from attributions that they make to a given disease in general. Also, people do not make the same estimate when they rate the risk to themselves, to their family members, or to people in general. Individuals tend to underestimate their personal risk and the risk of their family members compared to the risk of others, likely because personal risk and general risk would have different consequences.

Other limitation of the Study One is that participants in the focus groups could be distorted by factors, such as attempting to give more socially accepted answers, given the importance of social acceptance in Middle Eastern culture. The translation of focus groups discussions into English may have also resulted in loosing the nuances of the conversations, but this was overcome through validating observations of the research findings with the health care interpreters who shared the same culture with the focus group participants and through consultation with the Study Steering committee. Further, the use of the mixed method approach mitigated some of these challenges. Further, presence of the researcher from the same culture and languages in all the study process, including data collection and data analysis added to the credibility of the findings.
In spite of these limitations, the study has given a voice to participants that is not always heard in the mainstream discourse and has generated important observations for planning primary and secondary prevention initiatives for the targeted population group with a higher vulnerability to CVD.

4.7 Summary

There was found a lack of congruence between the perceived and estimated absolute CHD risk of the Middle Eastern women without a history of heart in this study. Particularly high risk participants underestimated their risk of CHD, although they were at increased CHD risk. It was also evident a lack of congruence between actual risk factors of the participants, such as blood pressure, cholesterol, and diabetes and the participants’ perception of their personal risk factors. These findings have significant implications for primary prevention programs and health promotion which will be discussed in Chapter Six.
Chapter Five

Study Two
5.0 Introduction

The previous chapter has presented findings from Study One and concluded that there was a lack of congruence between perceived and estimated absolute risk of CHD and risk factors among the study participants without a history of heart disease. This chapter provides a brief description and specific procedural considerations, results and discussion for Study Two.

5.1 Study aim

Study Two sought to investigate the relationship between perceived and estimated absolute of developing CHD among Middle Eastern women with heart disease targeting risk perception in participants who had been diagnosed with heart disease and exposed to mainstream cardiology services. The study sought to achieve the aim by addressing the following research questions:

1. In what way do Middle Eastern women with heart disease perceive the risk of CHD and risk factors in general?

2. In what way do Middle Eastern women with heart disease perceive their personal CHD risk and risk factors?

3. What is the estimated absolute CHD risk of Middle Eastern women with heart disease?

4. Is there congruence between estimated and perceived risk of CHD and risk factors among Middle Eastern women with heart disease?

5. Are there socio-demographic characteristics in the study sample that may explain CHD risk and risk factors?
6. How does migration impact upon the perception of CHD risk?

5.2 Study design

Data for this study were collected using the following complimentary methods:

1. Survey methodology was used to describe the participants’ CHD risk and risk factors as well as their perceptions of CHD risk, risk factors, self efficacy and response efficacy.

2. Physical measurements including waist circumference, weight, height, blood pressure

3. Data on biochemical measurements, such as blood cholesterol level, diabetes, creatinine, and BUN were collected from the patients’ medical record.

5.2.1 Brief description of methodology of the study

Using the process described in Study One, a survey was developed using both investigator-developed questionnaires and validated instruments. The conceptual model in Figure 2.5 informed the study design. The CHD Risk Factor Questionnaire-Version B was used to collect information on biological, behavioural and socio-demographic characteristics of the study participants. Physical data were collected as described in Chapter Three. Data relating to the biochemical data were obtained from the hospital medical records after obtaining consent from the participants. Levels of depression, anxiety and stress of the study participants were measured using the DASS 42. Data on participants’ perception of some CHD risk factors as well as their perception of personal risk of developing CHD in future were collected using the Perception of CHD Risk Questionnaire- Version B. Similarly, the DASS 42 was administered in the participants’ first language, but the questionnaires were
administered in English with the assistance of a bilingual health worker and health care interpreter.

### 5.2.2 Inclusion criteria

Women who identified themselves as belonging to the Middle Eastern culture and met the following criteria were eligible to participate in the study if they were:

1. Age $\geq 20$ years
2. Admitted to a cardiology ward with a diagnosis related to heart disease
3. Of Persian, Arabic, or Turkish origin and identified using this as their first language
4. Able to give informed consent

### 5.2.3 Exclusion criteria

Women were excluded from the study if they:

1. Had been hospitalised only for valvular disease
2. Had cognitive impairment or a potentially life limiting illness with life expectancy of less than 12 months

### 5.2.4 Recruitment

A total of 129 patients who met the inclusion criteria for the study and were approached during the period of July to September 2007, 8 patients refused to participate in or complete the study, mainly because of their poor health status and feeling tired. Therefore analysis was conducted on data from 121 participants. The eligible participants recruited from Auburn Hospital and Westmead Hospital in
Sydney, Australia and Madani Heart Hospital in Tabriz, Iran. Recruitment of participants from Iran allowed the researcher to study the impact of acculturation on risk factor burden of the participants, casual attributions and their CHD risk perception. Participants from Australia who were not able to read and write and/or communicate in English were approached by a health care interpreter to be invited to study and give a written consent. The health care interpreter then read the questionnaires out loud to the participants to obtain their responses.

5.3 Study results

The following section presents the socio-demographic characteristics of the study participants, such as age and education followed by the participants’ CHD risk factor profile, perception of their personal CHD risk, self efficacy and response efficacy. Further, the associations of these attributions to the participants’ CHD risk factors are examined.

5.3.1 Statistical analysis I: Descriptive analysis

Socio-demographic characteristics of the study participants

The socio-demographic characteristics of the participants are summarised in Table 5.1. The participants were an average of 54 ± 14.29 years, ranging in age from 20 to 86 years. There was no statistically significant difference in the age of participants according to the country of residence (t=-0.65, p=0.1), using an independent samples t-test and examining for the assumption of normality. Yet, there was statistically significant relationship between the country of residence and education (chi-square=8.60, p = 0.00) and income status of the participants (chi-square= 9.99, p = 0.01). Participants from Australia were more likely to be educated and report a higher income status.
Most of the participants 92 (79%) identified themselves as belonging to Iranian, followed by Turkish 10 (9%) and Arab culture 14 (12%). Thirty three (27%) participants were recruited from Australia and 88 (73%) from Iran. The study participants recruited from Australia were all permanent residents and residency ranged from 3 and 57 years with an average of 30 ± 12.10 years of residence. The majority of study participants, 99 (76%) participants reported caring for at least 1 person at home and 95 (73%) mentioned having some one helping take care of them at home. Data in the study tables relates to reporting the numbers with completed study items.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living with spouse* (%)</td>
<td>72/28</td>
</tr>
<tr>
<td>Never attended school * (%)</td>
<td>63/37</td>
</tr>
<tr>
<td>Muslim* (%)</td>
<td>90/10</td>
</tr>
<tr>
<td>Paid employment* (%)</td>
<td>5/95</td>
</tr>
<tr>
<td>Living in own home* (%)</td>
<td>72/28</td>
</tr>
<tr>
<td>Private health insurance* (%)</td>
<td>17/83</td>
</tr>
<tr>
<td>Adequate income and more* (%)</td>
<td>21/79</td>
</tr>
<tr>
<td>Current smoker or quitter in the last 12 months* (%)</td>
<td>9/91</td>
</tr>
<tr>
<td>Alcohol drinks* (%)</td>
<td>2/98</td>
</tr>
<tr>
<td>Adequate physical activity status* (%)</td>
<td>11/89</td>
</tr>
<tr>
<td>BMI ≥ 25 kg/m² (%)</td>
<td>73/27</td>
</tr>
<tr>
<td>Waist circumference ≥ 80 cm* (%)</td>
<td>90/10</td>
</tr>
<tr>
<td>Waist to hip ratio ≥ .80 cm* (%)</td>
<td>93/7</td>
</tr>
</tbody>
</table>

*Missing data

Reported family and personal health history

The self-reported family and personal health history of the participants are outlined in Figure 5.1 and Figure 5.2. It is important to note that all of the participants had documented heart disease to meet the study inclusion criteria. As shown, 51 (45%)
participants reported having a family history of heart disease, 12 (10%) stroke, 23 (20%) diabetes, 7 (6%) renal disease and 16 (14%) cancer. Further, 80 (78%) participants reported having a personal history of heart disease, 60 (54%) hypertension, 28 (25%) hypercholesterolemia, 10 (9%) stroke, 30 (26%) diabetes, 11 (10%) renal disease and 1 (1%) cancer. The fact that 22% of participants did not attribute their heart disease is striking.

**Figure 5.1** Self-reported family health history

**Figure 5.2** Self-reported personal health history
Biochemical risk factors of the participants

Table 5.2 shows the percentage of participants who had biochemical risk factors of CHD.

**Table 5.2 Biochemical measurements of the participants (n=121)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>High blood pressure (above clinic goal, taking anti-hypertensive medications, or high BP documented in their medical)</td>
<td>65</td>
</tr>
<tr>
<td>Diabetes (FBS≥ 8.0 mmol/l, taking blood-glucose lowering medications, or diabetes documented in their medical record)</td>
<td>52</td>
</tr>
<tr>
<td>High total blood cholesterol (TC ≥ 4.0 mmol/l, taking cholesterol lowering medication, or hyperlipidaemia documented in their medical record)</td>
<td>72</td>
</tr>
<tr>
<td>High low-density lipoprotein cholesterol (LDL-C ≥ 2.5 mmol/L)</td>
<td>67</td>
</tr>
<tr>
<td>Low high-density lipoprotein cholesterol (HDL-C1 &lt; 1 mmol/L)</td>
<td>65</td>
</tr>
<tr>
<td>Triglyceride ≥ 1.5 mmol/L</td>
<td>52</td>
</tr>
<tr>
<td>Blood urea nitrogen &gt; 7.1 mmol/L</td>
<td>18</td>
</tr>
<tr>
<td>Creatinine &gt; 97 μmol/L</td>
<td>11</td>
</tr>
</tbody>
</table>

* Missing data

The congruence between perceived and actual CHD risk factors

The history of blood pressure was compared against their actual risk. Sixty nine (65%) participants had the risk factor of high blood pressure while 60 (54%) participants reported having the history of high blood pressure. In other words, a gap between reported and actual risk factors of high blood pressure was observed in 9% of the participants.

Participants’ reported history of high blood cholesterol was compared against their actual risk. Fifty four (72%) participants had the risk factor of high blood cholesterol, but only 28 (25%) participants reported having the history of high blood cholesterol.
In other words, 47% of participants inaccurately either thought that they did not have a high blood cholesterol level or were unsure of having this risk factor.

Similarly, participants’ reported history of diabetes was compared against their actual risk. Forty eight (52%) participants had risk factor of diabetes, yet only 30 (26%) participants reported having the history of diabetes. In other words, 26% of participants inaccurately either thought that they did not have diabetes or were unsure of having this risk factor.

**Psychological status**

The psychological status of the study participants, as measured by the DASS 42 is summarised in Table 5.3. As shown, the majority of the participants reported symptoms of depression 77 (76%), anxiety 87 (86%) and stress 80 (80%), ranging from mild to very severe.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depression</strong>*</td>
<td></td>
</tr>
<tr>
<td>Not depressed (&lt;9)</td>
<td>24</td>
</tr>
<tr>
<td>Mild to moderate (10 to 20)</td>
<td>35</td>
</tr>
<tr>
<td>Severe to very severe (&gt;20)</td>
<td>41</td>
</tr>
<tr>
<td><strong>Anxiety</strong>*</td>
<td></td>
</tr>
<tr>
<td>Not anxious (&lt;7)</td>
<td>14</td>
</tr>
<tr>
<td>Mild to moderate (8 to 14)</td>
<td>27</td>
</tr>
<tr>
<td>Severe to very severe (&gt;14)</td>
<td>59</td>
</tr>
<tr>
<td><strong>Stress</strong>*</td>
<td></td>
</tr>
<tr>
<td>Not stressed (&lt;14)</td>
<td>20</td>
</tr>
<tr>
<td>Mild to moderate (15 to 25)</td>
<td>23</td>
</tr>
<tr>
<td>Severe to very severe (&gt; 25)</td>
<td>57</td>
</tr>
</tbody>
</table>

* Missing data
Estimated absolute risk against perceived personal risk

Of 110 participants who were eligible for estimation of cardiovascular risk (their precise diagnosis had been written in their medical record and information about their risk factors including diabetes status and kidney disease were evident), 99 (89%) participants were at high risk and 12 (11%) participants at risk of developing cardiac events in future.

Yet, the medians of perceived personal absolute CHD risk of the participants in the next 5 and 10 years were 5 and 7 respectively. Similarly, the medians of perceived personal relative CHD risk of the participants in the next 5 and 10 years was 5 and 7. These findings indicate that many participants did not necessarily perceive themselves as being at either increased absolute and relative risk over the next 5 years, but they perceived relatively a higher risk in the next 10 years. It is noted that data on perception of personal absolute and relative CHD risk of the participant were not normally distributed, using skewness/standard error of skewness, therefore, medians are reported in stead of means. Perceived personal absolute and relative CHD risks of the participants are set out in Table 5.4. As shown, only 40 (38%) and 61 (58%) participants perceived themselves as being at risk for CHD risk in the next 5 years and 10 years respectively. Similarly, some participants did not perceive them at increased relative CHD risk in the next 5 years (55%) and 10 years (40%).
Table 5.4  Perceived absolute and relative risk of CHD in the next 5 and 10 years (n=121)

<table>
<thead>
<tr>
<th>Variables</th>
<th>No</th>
<th>Not sure</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived absolute risk of CHD in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the next 5 years</td>
<td>12</td>
<td>50</td>
<td>38</td>
</tr>
<tr>
<td>the next 10 years</td>
<td>2</td>
<td>40</td>
<td>58</td>
</tr>
<tr>
<td>Perceived relative risk of CHD in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the next 5 years</td>
<td>10</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>the next 10 years</td>
<td>3</td>
<td>37</td>
<td>60</td>
</tr>
</tbody>
</table>

There were statistically significant difference in perception of personal relative risk in the next 5 ($Z=-2.273, p=0.023$) and 10 years ($Z=-2.115, p=0.034$) according to the participants’ estimated CHD risk, with at risk participants perceived higher relative CHD risk in the 5 and 10 years then high risk participants. These differences were not significant for perceived absolute risk in the next 5 ($Z=-0.298, p=0.765$) and 10 years ($Z=0.566, p=0.571$), using Mann-Whitney U test. Figure 5.3 displays the participants’ perceived relative and absolute CHD risk according to their estimated CHD risk. As can be seen participants in high risk group tended to underestimate their personal CHD risk.
Awareness of CHD risk in general

Sixty five (73%) participants knew a cardiac patient from their immediate family member, relatives, friends and colleagues. Yet, a large proportion of the participants 73 (88%) were not aware that heart disease is the first killer of women. Nevertheless, the majority of the participants 65 (76%) knew that heart disease can also affect people below 65 years.

Participants’ awareness of their heart diagnosis and causal attributions

As shown in Table 5.5, only 26 (28%) participants mentioned their diagnosis correctly while a large number of the participants 68 (72%) reported a symptom of heart disease as their diagnosis, such as chest pain, shortness of breath, or back pain. Further, above half of the participants 51 (55%) believed that stress was the cause of their heart disease and only 6 (6%) attributed to a modifiable life style risk factor,
such as obesity and high blood pressure. Twenty (21%) participants could not think of any reason.

**Table 5.5  Participants’ self-reported diagnosis and their personal causal attributions**

<table>
<thead>
<tr>
<th>Participants’ reported diagnosis</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct diagnosis</td>
<td>28</td>
</tr>
<tr>
<td>hest pain</td>
<td>35</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>19</td>
</tr>
<tr>
<td>Others (such as palpitation and back pain)</td>
<td>18</td>
</tr>
</tbody>
</table>

**Participants’ attribution to their disease**

<table>
<thead>
<tr>
<th>Attribution to their disease</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>55</td>
</tr>
<tr>
<td>I can’t think of any reason</td>
<td>21</td>
</tr>
<tr>
<td>Modifiable risk factors</td>
<td>6</td>
</tr>
<tr>
<td>Others (such as cold weather and hardness of work)</td>
<td>18</td>
</tr>
</tbody>
</table>

* Missing data

**Attribution to CHD risk factors in general**

Figure 5.4 displays the median ratings of casual attributions in general made to CHD by the study participants. The most highly attributed CHD risk factors were psychological distress including depression, anxiety and stress and the least lowly was menopausal status.
Perceived severity of the current heart problem

The median perceived severity of current heart disease of the participants was 7. In other words, participants perceived their current heart disease to be severe.

Self efficacy and response efficacy in relation to CHD risk reducing behaviours

The study participants rated highly the importance of reducing their risk of recurrent cardiac events. They also highly believed that engaging in heart healthy behaviours or reducing their risk factors, such as exercising or eating a low fat diet protects them from recurrent cardiac event, but they were not very confident that they would be able to reduce their risk.

5.3.2 Statistical analysis II: Inferential analysis

This section presents the results of the analyses used to investigate the associations between the demographic characteristics of the study participants and CHD risk factors, perceived absolute and relative risk, self efficacy and response efficacy. As
discussed previously these analyses were exploratory within the context of the conceptual model in Figure 2.5.

**Blood pressure**

There was no statistically significant difference in the mean blood pressure of the participants according to country of residence ($t=-1.898, p=0.060$), using an independent samples t-test. There was also no statistically significant correlation between blood pressure of the study participants and their attribution to high blood pressure ($r_s=0.197, p=0.177$), perception of personal absolute CHD risk in the next 5 and 10 years ($r_s =-0.012, p=0.933; r_s =0.169, p=0.249$ respectively) and relative risk in the next 5 and 10 years ($r_s =-0.22, p=0.879, r_s =214, p=0.141$ respectively), using Spearman's coefficient rank correlation.

**Obesity**

There was a low-moderate positive correlation between age and waist circumferences of the participants ($r=.310, p=0.001$), with older participants having higher waist circumferences than younger participants, using the Pearson correlation coefficient. There were also statistically significant differences in weight ($t=-3.245, p=0.002$), waist circumference ($t=-2.340, p=0.021$), BMI ($t=-3.040, p=0.003$) of the participants and the country of residence. Participants from Australia were more overweight and obese and had higher abdominal obesity than participants from Iran.

**Smoking**

There was a statistically significant difference in smoking status of the participants ($\chi^2=17.40, p=0.00$) according to the country of residence, with smokers being more likely to be resident of Australia. There were also significant differences in attribution to smoking ($U=-3.05, p=0.00$) according to the participants’ smoking status, with smokers attributing highly to smoking than non smokers. There was no
significant difference in smoking status of the participants according to their other socio-demographic characteristics, perception of risk, self efficacy and response efficacy.

Physical inactivity
There were statistically significant differences in anxiety ($F=4.53$, $p=0.01$) and depression scores ($F=5.59$, $p=0.00$) of the participants according to their physical activity, with participants undertaking a moderate physical activity having lower anxiety and depression scores than those who were not physically active. There were no significant differences in physical activity status of the participants according to their other socio-demographic characteristics of the participants, perception of risk, self efficacy and response efficacy.

Psychological distress
An independent samples t-test revealed statistically significant differences in depression ($t=-2.02$, $p=0.04$), anxiety ($t=-3.15$, $p=0.00$) and stress ($t=-3.33$, $p=0.00$) status of the participants according to the country of residence. Participants from Australia were more likely to be psychologically distressed than participants from Iran. There were statistically significant differences in perceived severity of heart disease according to the participants’ depression ($\chi^2=11.56$, $p=0.00$), anxiety ($\chi^2=8.04$, $p=0.01$) and depression levels ($\chi^2=16.07$, $p=0.00$), using Kruskal-Wallis H test. Participants with higher depression (>20 on the DASS 42), anxiety (>14 on the DASS 42) and stress scores (>25 on the DASS 42) perceived their current heart condition to be more severe than those who had depression, anxiety and stress scores within normal limit. The Kruskal-Wallis analyses revealed no significant differences in attribution to CHD risk factors according to the participants’ depression, anxiety and stress levels.
Perceived severity of heart disease

There was a low-moderate positive correlation between participants’ perception of severity of their heart disease and their depression ($r=0.25, p=0.00$), anxiety ($r=0.31, p=0.00$) and stress ($r=0.37, p=0.00$) scores, using the Pearson correlation coefficient. Participants with higher perception of the severity of their disease had higher depression, anxiety and stress scores.

Perceived personal CHD risk and importance of reducing the risk

There were also significant differences in perceived absolute risk of cardiac events in the next 5 years according to the participants’ depression ($\chi^2=9.96, p=0.00$) and stress levels ($\chi^2=7.06, p=0.02$), using the Kruskal-Wallis analyses. Participants with higher depression (>20 on the DASS 42) and stress scores (>25 on the DASS 42) perceived a higher risk of recurrent cardiac events within the next 5 years than participants who had depression and stress scores within normal limit. The Mann-Whitney $U$ tests revealed statistically significant differences in perceived absolute CHD risk in the next 10 years ($U=-2.15, p=0.03$) and perceived relative risk in the next 5 years ($U=-2.33, p=0.02$) according to the country of residence, with participants from Australia perceiving higher relative and absolute risk of developing recurrent cardiac events in the next 5 and 10 years respectively. However, differences in risk perceptions were not statistically significant when controlling for psychological distress of the participants, using univariate statistics. This means that perception of CHD was influenced by psychological status of the participants rather country of residency.

Similar to Study one, there were not statistically significant differences in perceived absolute CHD risk in the next 5 and 10 years ($\chi^2=0.324, p=0.850$; $\chi^2=0.466, p=0.792$ respectively) and relative risk in the next 5 and 10 years ($\chi^2=0.002, p=0.999$);
\( \chi^2 = 2.789, \ p = 0.248 \) according to the participants’ education levels, using the Kruskal-Wallis analyses. There were, however, significant differences in perceived importance of risk reducing behaviours according to the education level of the participants \( (\chi^2 = 7.003, \ p = 0.030) \), using Kruskal-Wallis \( H \) test, with participants with higher education perceiving highly the importance of CHD risk reducing behaviours than non educated participants did. Further, there were statistically significant differences in perceived importance of reducing risk according to country of residence \( (U = -3.360, \ p = 0.001) \), with participants from Australia perceiving the importance of reducing personal risk higher than participants from Iran.

### 5.4 Discussion

Women in Study Two were inpatient participants with diagnosis of heart disease and recruited from both Australia and Iran. Study participants from Australia reported higher education and income than those from Iran.

#### 5.4.1 CHD risk factor profile of the participants

A relatively younger age of the participants \( (54 \pm 14.29 \text{ years}) \) in this study, regardless of the country of residence, may reflect the burden of CHD in this population. Although not unexpected, the younger ages of participants in this study is worthy of discussion. There is an emerging burden of CHD and onset of the disease at an earlier age in some developing countries compared with the developed world.\(^4\) Findings of the INTERHEART study showed the youngest patients with MI in the Middle East (51 years) and the oldest patients in western Europe, China and Hong Kong (63 years).\(^5\) The epidemiological transition, urbanisation and adverse lifestyle changes (see Figure 1.2) on one hand and lack of national primary prevention strategies on the other hand are accountable for the predictable rise in CHD events in
these countries. The early onset of CHD in the participants may also reflect susceptibility to CHD among this population and a need for further studies. Available epidemiological studies demonstrate overall a poorer CHD risk factor profile among Iranian women than men including diabetes, high blood pressure, abnormal lipid levels and inactivity.

Women in this study demonstrated an adverse risk factor profile with many participants having high blood pressure, abnormal lipid level profiles, diabetes, low levels of physical activity, BMI ≥ 25 kg/m², waist circumference ≥ 80 cm and WHR ≥ .80. These findings have an implication for cardiac rehabilitation programs, as adverse risk factor profile put patients at increased risk of recurrent cardiac events.

The high prevalence of CHD risk factors in the study population underscore the significance of secondary and tertiary cardiovascular prevention programmes in this population. Yet, knowledge, awareness and perception of one’s personal risk as well as individual and cultural factors impact upon their care-seeking behaviours to reduce the risk. Surprisingly, in parallel to Study One, generally participants in this study did not acknowledge the burden of CHD in women, although they had all been hospitalized with a diagnosis of heart disease.

5.4.2 The relationship between perceived and estimated absolute risk

A noteworthy finding of this study is that 62% and 42% of the participants did not perceive themselves at increased risk of recurrent cardiac events in the next 5 and 10 year respectively, although their absolute risk is high. Furthermore, 55% and 40% of the participants did not perceive themselves at greater risk in the next 5 and 10 years respectively, compared to their peers. It is, however, well-documented that
those with a history of CHD are at substantial risk of recurrent cardiac events including heart attack, sudden death, angina pectoris, heart failure and stroke.\textsuperscript{38, 103}

Some level of underestimation of risk has been documented in cardiac patients. For example, Moran et al.\textsuperscript{46} reported that 16\% of cardiac patients in their study played down their risk. The higher rate of underestimation of risk by the high risk participants in this study is alarming. As expected from the past research,\textsuperscript{46, 239, 243} relatively a higher proportion of participants in this study perceived themselves at increased absolute and relative risk than participants in the Study One.

There was also found a lack of congruence between the participants’ perception of their personal CHD risk factors and their clinical data. Some 15\% of the participants denied having the risk factor of high blood pressure, 47\% of the participants inaccurately either thought that they did not have high blood cholesterol or were not sure of having this risk factor. Further, 26\% of the participants inaccurately either thought that they did not have diabetes or were not sure of having this risk factor. An explanation for this finding is that some of the participants might have thought that they no longer had high blood pressure, high blood cholesterol and diabetes, as they had been controlled with medication, or these risk factors might have just been diagnosed in some participants during their recent hospitalisation. In an epidemiological study in Iran, Azizi et al. reported that about one-third of total cases with diabetes were undiagnosed.\textsuperscript{436} The lack of awareness of personal CHD risk factors among the participants is inconsistent with the emerging literature which reports more cardiac patients can correctly identify their personal risk factors.\textsuperscript{437}

The gap between perceived and estimated absolute CHD risk and risk factors, particularly among participants from Iran can partially be explained by their limited knowledge and awareness of CHD risk in general, as participants from Australia had
relatively higher perceived absolute and relative risk. Lack of national guidelines in Iran to address and guide patient-physician communications is one possible contributory factor to the limited knowledge and low health literacy related to cardiovascular disease among this population. Further, unwillingness of health care providers to disclose patients’ conditions because of a cultural belief that this may exacerbate patients’ condition can also partially explain the observed gap between estimated absolute and perceived CHD risk. These findings have a significant implication for cardiac rehabilitation programme, as risk perception and awareness of one’s personal risk factors are well-established factors related to risk factor modification. According to the study conceptual model, successfully implementing primary and secondary cardiovascular strategies. Integral to achieving optimal health outcomes is an appropriate level of risk perception, belief in efficacy of the provided programs, high self efficacy and tailored environmental support. An accurate understanding of risk is the first step to make appropriate choices which will result in reduction of risk, such as adherence to low fat diet and appropriate adjustment of behaviours is necessary to maximise health outcomes. In a prospective study, Cooper et al. found that cardiac patients who correctly identified their personal risk factors, such as high blood cholesterol were more likely to attend CR. This has considerable implications for health providers to assist patients to gain an appropriate level of risk perception and a clear understanding of their personal risk factors while also improving their self efficacy. Understating cultural variations in illness behaviours is also important. For example, a belief that patients should rest and be supported by their families in Middle Eastern culture may impede their participation in CR, which are mostly exercise-based programmes.
5.4.3 Casual attributions for CHD

In parallel with the findings of Study One, participants highly rated stress, anxiety and depression as the cause of heart disease. While participants also rated highly lifestyle factors, such as obesity, physical activity and high blood pressure as cause of heart disease when they made general attributions, they did not specifically apply these views to their own situation. Although a systematic review of the literature shows that stress is the major casual attribution made by cardiac patients,\textsuperscript{143} attributions that people make about their own disease has been shown to be different from attributions that they make to a given disease in general. People tend to give more weight to epidemiological evidence and lifestyle factors when they make attributions in general.\textsuperscript{432} However, attribution to external factors, such as stressors is believed help cardiac patients to construct a coherent story about what has happened to them.\textsuperscript{143}

A concerning finding of this study is that the participants did not attribute their condition to modifiable risk factors, such as high blood pressure, high blood cholesterol, diabetes, obesity and physical inactivity, although many of the participants had these risk factors. Only 6\% of the participants attributed their heart disease to modifiable lifestyle risk factors including high blood pressure, high blood cholesterol. The discordance between causal attributions and actual risk factors in the study participants is consistent with the past research.\textsuperscript{232, 254} For example; Murphy reported that only 5\% of cardiac patients who were hypertensive, attributed to hypertension as the cause of their heart disease and the participants also underestimated their risk factors of high cholesterol, obesity and high-fat diet.\textsuperscript{232} Consistent with past research,\textsuperscript{97} the participants did not attribute to their diet while the BMI and waist circumferences values indicated that overweight was a problem
for majority of participants. Further, 21% of the participants in this study could not attribute to any reason, probably because they did not have stress. Sahin-Hodoglugil \textsuperscript{87} reported that the belief that sadness is the reason for diseases was so strong among Turkish participants that some participants who had the disease, but according to their perception, did not have sadness had difficulty in understanding the reason for their disease.\textsuperscript{87} Yet, this finding is consistent with the literature which shows that some 18 to 24% of cardiac patients have no idea about the cause of their heart disease.\textsuperscript{45,232,438} Particularly, non-English speaking women were more likely than others to report having “no idea” about the causes of heart disease in general, implicating the inaccessibility of the CHD health information to people from diverse culture and language groups.\textsuperscript{232} There is evidence that lack of a theory about the cause of one’s illness has been associated with poorer recovery.\textsuperscript{439}

In this study some participants also incorrectly attributed to the triggers of angina as the cause of their disease, such as cold weather or a big meal, findings that are yet again consistent with Sahin-Hodoglugil study\textsuperscript{87} in that the immediate proceeding event, before the beginning of unset was usually believed by the participants as the cause of heart disease, such as strong tea.\textsuperscript{87}

Some participants (20%) denied their heart condition and stated that they only had arm pain or shortness of breath. Participants reported symptoms of heart disease, such as chest pain, shortness of breath, or back pain as their disease diagnosis and some did not think that their symptoms had a cardiac basis. This finding has an implication for CR and secondary prevention programmes, since people may feel that they have recovered now that their symptoms have abated and as a consequence not take their condition seriously and engage in risk factor modification. A reason that has been noted for not complying with dietary recommendations was related to
the perception that dieting was for a temporary period of time not for ever, in other
word, once the acute distressing event was resolved. In another study, 
underestimation of importance of symptoms delayed early care-seeking. This 
accentuates the need for an effective risk communication strategy between health 
providers and patients to assist patients to gain an understanding of the chronic 
nature of heart disease.

According to Leventhal’s self regulatory model, symptoms are the major drive in 
taking action related to health threats and without symptoms people may not 
continue treatment. Denial refers to an unconscious psychological response to 
threats and help individuals to control anxiety producing thoughts and feeling and it 
is common in cardiac patients. Risk denial has also been associated with perceived 
control over risks. However, false, or distorted perceptions may engender patients’ 
health by refusing necessary treatment and life style changes. Listening to patients, 
developing an empathic understanding, explaining them the symptoms of heart 
disease, causes/ risk and improving patients’ self efficacy by explaining what actions 
to take if symptoms develop may help patients to cope with their condition and 
establish realistic objectives for future.

Inaccurate causal attributions in individuals with a history of cardiac event should be 
considered seriously, as they may interfere with effective risk reducing behaviours. There is evidence that participants who do not attribute to lifestyle factors, are 
less likely to be engaged in persistent subsequent action, such as attending CR. Cooper et al. also found that participants who attributed to life style factors were 
more likely to attend CR than those attributed to stress. Further, it is also well 
documented that causal attributions can be predictive of function and outcomes of
Best practice guidelines highlight the importance of addressing and correcting misconceptions throughout the rehabilitation phase.

5.4.4 Psychological concerns

A larger number of participants in this study reported symptoms of depression (76%), anxiety (86%) and stress (80%), compared to Study One. This is likely to be expected because of symptom burden and recent hospitalisation. Although generally cardiac patients, particularly women show poorer psychological and functional adaptation, a far higher level of psychological distress in these participants is an issue of concern. There is evidence that some 47% of patients develop depression after coronary artery events. Yet, it should be noted that a variety of measurement tools have been used in screening for depression, such as the Beck Depression Inventory (the BDI) and the Hospital Anxiety Depression (HAD) scale and these tools are varying in their sensitivity to different levels and dimensions of depression. The DASS is a recommended scale for use in cardiac rehabilitation settings in Australia. Using DASS 21, Digiaccomo et al. reported symptoms of depression in 33.4%, anxiety in 39.6% and stress in 29.7% of Australian women within 6 months experience of a coronary cardiac event. A relatively low level of psychological distress reported in Digiaccomo et al. may be because of the longer term adjustment of some of the participants to their heart condition. A higher prevalence of psychological distress among Iranian cardiac patients have also been reported. Perception of CHD risk in the study participants was positively related to psychological status of the participants, with psychologically distressed participants reported a higher perceived personal CHD risk than those with normal psychological status. Although the analysis of data on inpatient participants in this study did not reveal a significant difference in stress attribution according to depression, anxiety
and stress scores of the participants, the lack of a statistically significant difference is possibly because of the excessive stress attribution in both psychologically depressed and non depressed participants.

These findings underscore the importance of monitoring and treating psychological stress the same as other CHD risk factors, such as high blood pressure and smoking.50 Cardiac rehabilitation guidelines recommend that health care practitioners ask about their clients’ major concerns and stressors and take steps to reduce the influence of stress on care-seeking decisions.408, 446 The recently conducted systematic reviews show that depressed cardiac patients demonstrate increased mortality rate, greater cardiac re-hospitalisations and reduced quality of life.78, 79, 442 Psychological factors also appear to be important in a global risk modification, since they can affect patients’ capacity and willingness to comply with medical regimes.50 Compared to those without depression, depressed cardiac patients display lower adherence to prescribed medications and risk reducing behaviours, such as smoking cessation and adherence to dietary recommendations.142, 366 This is of particular significance given the importance of self-management and adherence to medical regime in chronic diseases including CHD.

In this study, participants perceived their heart condition to be severe, which can affect their psychological adjustment to heart disease. Accordingly, the participants’ perception of the severity of their current heart condition was positively associated with their psychological distress. These findings are consistent with previous research which suggested that patients with myocardial infarction who had a negative illness representation were more likely to have depression and anxiety than those who had a positive illness representation207 Negative illness representations have been associated with delay in recovery.218 To reduce the burden of psychological
distress in CHD health outcomes, recommenced frameworks for CR emphasise on taking into account psychological factors when assessing an individual’s risk of CHD, assessing all cardiac patients for co-morbid depression and treating appropriately psychological distress using cognitive-behavioural therapy alone or in combination with medication if necessary.\textsuperscript{306, 446} The UK guidelines further, appreciate the importance of addressing main concerns of patients and suggest a flexible approach to cardiac rehabilitation which takes into account individuals need and auditing outcomes.\textsuperscript{446} For example, designing culturally competent interventions to improve physically activity may improve the psychological status of women as well as cardiovascular health, given those physically active participants in this study demonstrated a better psychological wellbeing.

5.4.5 What difference does migration make?

Although differences in some CHD risk factors including total cholesterol level, diabetes and hypertension of participants were not statistically significant according to their country of residence, the immigrant women in this study had higher BMI, weight and waist circumference than their counterparts from Iran. Further, they were more likely to be a smoker and report symptoms of depression, anxiety and stress than participants from Iran. These results demonstrate that the effect of acculturation may be reflected among Middle Eastern women immigrants by increased waist circumferences, obesity, smoking, depression, anxiety and stress. The pattern of CHD risk factors among the immigrant women in this study is consistent with the literature.\textsuperscript{160, 162} Adopting Western lifestyle and relatively easy access to chip food through fast food shops are possible explanation for overall increased obesity rate among immigrants. The results of this study coupled with the related literature have an implication for tailoring interventions to address obesity, smoking, psychological
distress of immigrants in Australia. These interventions which also take into account cultural differences in beliefs and values, such as a belief that hookahs are safer than cigarettes among Arabs, have the capacity to improve general health of immigrants, given that many of these risk factors are common underlying cause for various disease, including cardiovascular disease, cancer and diabetes, which together accounted for 65% of all deaths in the year 2000. Compared to participants from Iran, a relatively perceived higher absolute and relative risk of CHD in the immigrant women can be also explained by their perceived higher psychological distress, influencing not only the prognosis of heart disease diagnosis, but also health outcomes and adopting risk reducing behaviours.

Further, perceived higher importance of CHD risk reducing behaviours among the immigrant women compared to participants from Iran may implicate getting acquaintance with the preventive-oriented health care system of Australia by these women, however, a range of barriers exist related to utilization of mainstream health services, including lack of English fluency among women and culturally component programmes, as found in Study One and supported by the literate. Further, the importance of socioeconomic and psychological factors in modulating health outcomes among women underscores the need to develop interventions to target these issues among immigrant women.

5.5 Limitations and strengths of this study

In addition to limitations related to generalisibility and using investigator developed questionnaires in the light of lack of standard instruments, this study used the 2007 update evidence-based guidelines for cardiovascular disease prevention disease in women to estimate CHD risk of the participants. This guideline has been
developed based on research mainly conducted in white population Caucasians. As to be expected the absolute risk of these participants was high and the primary objective was to examine the congruence with the study participants’ perceptions of their risk.

Despite these limitations, this study provided insight into causal attribution of Middle Eastern women. Further, by recruiting participants both from Australia and Iran, data on CHD risk and risk factors as well as perceptions of the risk were compared between the two groups, allowing the researcher to study the impact of immigration and acculturation on CHD risk and perceptions. The comparison between immigrant women in Australia is both strength and a weakness. This heterogeneity provides a valuable insight into the immigration experience, although methodological challenging in the standardisation of study tests and administration should be considered. A further limitation is that this study was exploratory and largely based upon recruitment timelines associated with the doctoral program of study rather than pre-specified power calculations. Therefore, data should be considered within this context.

5.6 Summary

Women in this study demonstrated a limited knowledge and awareness of burden of CHD in general. The participants also had a limited awareness about their personal risk factors, heart diagnosis and causes of their heart disease. Further, participants underestimated their CHD risk, although they were at increased risk of recurrent cardiac events due to their risk factor burden. These factors were further exacerbated by lower health literacy and socio-economic status. The lack of congruence was also evident between participants’ perception of their personal risk factors including
blood pressure, cholesterol and diabetes and their clinical data. The following chapter seeks to synthesise the findings of Study One and Study Two to address the research questions posed by the Middle Eastern Women’s Study.
Chapter Six

Conclusion
6.0 Introduction

The findings from the Middle Eastern Women Study have been provided and discussed in the preceding chapters. This study used the strengths of mixed method approach to explore CHD risk perception among Middle Eastern women and compared these perceptions with the study participants’ estimated absolute risk to inform cultural competent interventions and also to set the scene for later larger-scale studies. By involving participants from diverse backgrounds in terms of age, education, and accessibility to mainstream information, the study sought to provide a broad insight into perception of CHD risk, casual attributions, and the way socio-cultural differences in these perceptions affect risk reducing behaviours among Middle Eastern women. This chapter will integrate the two phases of the study and discuss key recommendations using the conceptual model.

Several salient points emerged from the findings of both Study One and Study Two. Of major significance was that women, both with and without heart disease, had a limited knowledge about heart disease and risk factors in general. They tend to underestimate the important role of modifiable CHD risk factors such as high cholesterol level, high blood pressure, and diabetes, particularly when making attributions for their personal disease. The results of both qualitative and quantitative approaches showed that the most highly attributed risk factor for CHD among these women was stress. Perceived psychological distress appeared to impact on Middle Eastern women’s perception of risk in general and CHD risk in particular. Women, particularly at high risk tended to underestimate their personal risk.

Further, the assumptions identified in the conceptual model largely turned out to be correct and applicable for Middle Eastern women. Regardless of the advanced
technology in identifying causes of CHD, women in this study derived explanations for their disease out of socio-cultural context. Consistent with the past literature, older age and higher psychological distress were associated with an increased perception of personal CHD risk. Obesity and family history of heart disease were related to an increased perceived CHD risk in long term (10 years), but not in short term (5 years). These findings have important implications when communicating CHD risk with women who possess these risk factors. Although level of education and country of residency were not related to the participants’ perception of CHD risk, the highly educated participants and those resided in Australia perceived highly the importance of risk reducing behaviours than lowly educated participants and those from Iran. The study indentified some barriers to the risk reducing behaviours. The findings underscore the importance of understanding Middle Eastern women’s perception of CHD risk and risk reducing behaviours, first within the context of women, second immigration and third their cultural background reality. Understanding these perceptions is an initial step in tailoring interventions and directing future research toward assisting this population to reduce CHD risk. These findings have applications for policy, clinical practice, and research.

6.1.1 Policy

Primary and secondary CHD prevention programmes are evidence-based strategies to improve cardiovascular outcomes. Yet, there are many barriers impeding utilization of these services, particularly among Middle Eastern women, including cultural values and considerations. It is, therefore, important that the CR programme increases the focus on the tailoring of the programmes to meet the needs of people from culturally and linguistically diverse populations and assesses the effectiveness of such adjustments in utilisation, concordance, and satisfaction of diverse clients.
Equipping health professionals with knowledge, awareness and sensitivity to diverse cultures could enable health professionals to tailor care to a range of situations and apply these concepts when delivering care to diverse cultural communities. Middle Eastern women would more likely to benefit from CHD prevention programmes which target this population and take into account their specific needs and health goals as well as cultural considerations. Findings of this study support the statement of the American Heart Association (AHA)\textsuperscript{224} which emphasises that cultural competence should be at the core of any effort to fully address disparities in CHD. These findings also demonstrate a need to improve awareness and understanding of symptoms of CHD and its risk factors as well as assisting women to achieve a reasonable perception of their personal risk and risk factors. These programmes should stress dietary counselling, physical activity, and the importance of screening for high blood cholesterol, diabetes and high blood pressure which are necessary to promote lifestyle modifications. National programmes that focus on primary prevention and improving health literacy of the society need to be tailored culturally and linguistically competent and take into account the low health literacy of women from developing countries including Middle East. Inaccurate casual attributions, belief in fatalism, unrealistic perception of their personal CHD risk and low risk reducing behaviours among the participants in this study are related to the multiple challenges they already face in immigration, lower socio-economical status and diverse socio-cultural health values and beliefs. These factors are aggravated by the lack of culturally competent services.

There remains an increasing need to develop more comprehensive culturally oriented cardiovascular interventions, education, and research. In spite of the increasing focus on cultural diversity and the importance of focussing on the needs of people from
culturally diverse backgrounds, the translational aspects of this advocacy have been less clear, likely due to the lack of funding, resources, and expertise to enable a positive and efficient response. In order to successfully implement these policies, sufficient resources and skills need to be provided to clinicians to enable culturally competent care. They need to be aware that a failure to recognize traditional practices of the women of diverse cultural groups could mean devaluing the women as persons. Cultural competence training is a potentially beneficial strategy for improving the knowledge, attitudes, and skills of health professionals. Beach et al. have provided conclusive evidence demonstrating the relationship between cultural competence training and health outcomes. They suggest that further research on cultural competence training should focus on the style of cultural competence training and how this impact on health related outcomes. Cultural and linguistic competence need to be incorporated in policymaking, administration, organisational vision and mission and clinical standards and guidelines. Cultural competence need to be focused both in the practice setting and in the research domain. Efforts to integrate cultural competence to educational programmes for nursing students and the medical curriculum in the United States are some optimistic initiatives. There will be, however, a need for a standardised approach and guidelines to teaching health care professionals how they can best care for diverse patient populations.

Findings of this study also support an agenda for promoting mental health of immigrants, in particular that of Middle Eastern women in Australia. Given that association between psychological status and CHD is well established, psychological distress should not be considered as implicit elements of the immigration experience. General practitioners and other health workers should undertake screening for psychological distress among their immigrant clients and this need to be considered a
factor in cardiovascular health promotion. Many immigrants have difficulty in accessing mental health services. Improving access to mental counselling, offering support groups, and teaching effective coping strategies may smooth the psychological adjustment of immigrant Middle Eastern women and improve the mental health of immigrants. Culturally and linguistically competent programmes which reduce stigma in local communities and offering culturally accepted alternative therapies, such as cognitive behavioural counselling, interpersonal therapy, or physical activity rather than medication may also be useful. Further, assessment of psychological distress and providing an appropriate counselling or medical treatments should be considered seriously for cardiac patients to improve their quality of life as well as cardiovascular health outcomes.

Furthermore, in this study women from higher socio-economic status demonstrated a favourable risk factor profile than those from lower socio-economic status, with having a lower BMI, waist circumference, and symptoms of depression, anxiety, and stress and smoking less. These findings highlight the importance of empowering women through facilitating employment and education.

6.1.2 Research
The insights provided by the Middle Eastern women participants contribute valuable information related to the needs of this population and have several implications for future research. Clearly, culture is a critical element in identification and management of CHD risk, where individuals' decisions, attitudes and enduring practices are important. From perspective of culture, there is a shortage of information with reference to the management of CHD in culturally and linguistically diverse populations. Information on the tailoring of CR programmes for
culturally and linguistically diverse communities is sorely lacking, due to under-
representation of minorities and cultural groups in studies. There is evidence that
culturally sensitive programmes which are accessible to the target population have
been more successful in involving those from diverse cultural and ethnic background
in risk reducing programmes.\textsuperscript{168} Yet, to date, health systems fall short of empirical
data documenting what cultural competency techniques are effective or when and
how to implement these techniques properly.\textsuperscript{458} As a result, there is a lack of
guidelines and standards to assist providers in delivering appropriate services to
culturally and linguistically diverse groups. The Australian government appreciates
this issue and believes that cultural factors are often not understood and therefore not
taken into account in mainstream health services.\textsuperscript{459} Increasing the debate and
discourse regarding cultural diversity in cardiovascular literature should increase the
awareness and stimulate research in striving for culturally appropriate and acceptable
interventions and also the development of interventions to increase cultural
competence among health professionals. Further, directing future research toward
evaluation of culturally and linguistically competent programmes in improvement of
knowledge and awareness of CHD risk and risk factors, accurate causal attributions
and risk perceptions as well as uptake of the screening programmes and CR among
Middle Eastern women are needed to increase the evidence base for embracing a
cultural competence approach in primary and secondary cardiovascular prevention
programmes.

In addition, undertaking strategies to increase the involvement of minority groups,
particularly Middle Eastern women in studies on the management, treatment, and
prevention of CHD and focusing on their unique needs is an important way forward.
Key strategies in increasing access of marginalised groups to services include: 1)
increasing participation of health professionals and health workers from target populations; 2) undertaking interventions within a context of reciprocity and respect; 3) implementing strategies to promote engagement and participation in service development by local communities; 4) providing culturally appropriate resources and support to local services; 5) using a whole of person approach, recognising cultural, psychological and spiritual issues, rather than a disease specific approach and; 6) acknowledging the impact of historical, social and financial circumstances on adverse health outcomes in marginalised populations.\textsuperscript{20, 458, 460}

In addition, the need for research on the mental health needs of migrant women remains a priority, particularly when there are cultural and linguistic barriers to delivery and uptake of relevant services. An inherent need also exists in furthering research in the area of impact of immigration and acculturation in CHD risk perception and causal attributions. First-generation migrants have the challenge of many present problems, such as social isolation, lack of support, financial issues and family conflicts due to immigration and acculturation may resulted in greater priority being given to the present problems, such as the importance of mental health for the participants this study. As a result, first-generation migrants may not consider their future cardiovascular health as a priority. These findings support the notion of competitive priority applicable to CHD risk perception and suggest that psychosocial fulfilments may lead to an overlooking of CHD risk and risk reducing behaviours among migrant women. Competitive priorities and their impact on perception of CHD risk and practices need further investigations in different contexts and using proper sample sizes. Also high psychological distress among the study population and their excessive causal attributions to depression, anxiety, and stress calls for
further investigations to understand the impact of culture and ethnicity on these experiences and perceptions.

Findings of the study showed a higher prevalence of some CHD risk factors, such as obesity, waist circumferences, and physical activity among the study participants which far exceed the national averages. Further, risk estimate using the non-laboratory-based method confirmed an increased CHD risk among this population. Yet, further studies with larger sample sizes may better explain the burden of CHD risk factors among Middle Eastern women. Publishing research data by gender and cultural background may also yield a better picture of CHD risk factors profile among minorities, particularly Middle East women.

### 6.1.3 Practice

The discrepancy between perceived and absolute CHD risk and risk factors among the participants underscores the importance of designing interventions to target specific misperceptions regarding CHD among Middle Eastern Women. Perhaps a major responsibility of healthcare providers is to inform women of CHD risk and discuss with women their personal risk and risk factors. Women need to be convinced that they have a certain level of CHD risk and that they can take a significant role in preventing or delaying adverse cardiac events. Organising heart health workshops in the community languages, and development of a strategy to transmit culturally appropriate heart health information via ethnic media may be beneficial. Health-care providers need to assess their clients from Middle East for inaccurate risk perceptions and adverse perceptions, such as fatalism and denial. They need to listen to their clients, correct misperceptions and provide factual information about heart disease causation. Women should have a clear understanding
of their heart disease and how the risk factors relate to their condition if sustainable
behaviour change is expected to occur. Discussion of the risks and benefits with
patients accompanied by providing different choices has been associated with an
increased self efficacy and uptake of health programmes. Yet, more detailed
personalised risk communication has been related to a smaller increase in uptake of
these programmes. This may have an implication for health professionals to
choose a risk communication model which best fit their clients from Middle East,
where health professionals do not often disclose patients’ conditions and discuss with
patients about their personal risk. Yet, the efficacy of different methods of risk
communication in diverse cultural group including Middle Eastern women needs
further investigation. As discussed in the preceding chapters, improving an
individual’s perception of risk is complex and extends far beyond providing
information alone. Understanding factors possibly driving the gap between actual
and perceived risk has significant implications for the implementation of effective
nursing interventions. Health professionals including nurses are in an excellent
position to assess the accuracy of risk perception and should consider this factor
when providing education and counselling strategies.

Findings from this study demonstrated that many women had a limited knowledge
about their personal risk factors and identified the need to increase knowledge and
awareness in certain areas, such as contribution of menopause and diabetes to
developing CHD in women. These findings have implications for primary and
secondary CHD prevention programmes, where a lot of afford from public is needed
to modify their lifestyles. Evidently, current heart health promotion programmes are
not reaching as wide an audience as needed, and this is particularly critical for
socially isolated groups and people from non-English speaking background.
concern, many of these people of the greatest need have the greatest challenges in accessing mainstream services. For example, health education materials are often written at an inappropriate reading level, particularly for minority groups for whom English may be a second language. These materials need to consider the health literacy levels of patients and be culturally sensitive and appropriate.\textsuperscript{152} The language barrier may partially explain why peers were reported as a major source of health information by minorities, supported by the study findings.\textsuperscript{370} These important issues must be addressed if interventions are to be successfully implemented, adopted and lead to significant and meaningful changes in risk behaviours related to CHD.

6.1 Recommendations

The information provided below is based on findings from this study coupled with related literature and believed to have valuable implications for health care providers when providing care to their clients from Middle East. These findings have the capacity to improve uptake of primary and secondary cardiovascular prevention programmes and improve CHD health outcomes among this population group.

- It should be noted that understanding the significance of health behaviours advised by health care providers may not be straightforward to first-immigrant Middle Eastern women, due to their lower education and health literacy, and coming from treatment-oriented health care system. Further, cultural considerations may impede Middle Eastern women to discuss about their concerns with health professionals.\textsuperscript{87} Health providers, therefore, need to entail extra time and effort to assess their clients for understanding of their personal risk and attempt to bridge the gap between perceived and actual risk.
When inviting to CR programme, health care providers should be aware that a Middle Eastern woman may not be the person making decisions on her own about health care utilisation. Usually, the person who controls the finances in the family makes decisions about health care utilisation. It is, therefore, of significant importance that the person who makes these decisions perceives the importance of CR attendance for the family member. It is also important to involve family members, particularly spouse when giving a Middle Eastern woman an advice about life style change. The family can be a great source of support if the necessity of a given health advice is clearly understood.

Interventions which have been tailored to cultural needs of Middle Eastern women have the capacity to increase CR attendance among this population group, such as arranging walking groups for women, where the participants can also enjoy sociability and tailoring CR programme to allocate a set amount of hours for women only.

As part of CHD risk assessment, health care providers need to assess their clients for depression, anxiety and stress, using a valid instrument and refer them to appropriate mental health services if necessary. The Persian and Turkish versions of the DASS 42 have been developed for the purpose of this study and are being used by CR in Sydney West Area Health Service (SWAHS). Health care providers should also be aware that Middle Eastern women may not recognise or report symptoms of depression, because psychological diseases carry with them a cultural stigma.

When giving advice about CHD risk reducing behaviours, such as physical activity or diet modifications, health care providers should consider financial
issues and socio-economic status of their clients as well as cultural
considerations.

6.5 Conclusion

This study provided insight into CHD risk perception and the causal attributions
among Middle Eastern women and revealed several barriers to CHD risk factor
modification. High rates of obesity, inactivity, and symptoms of depression, anxiety
and stress observed among the participants in this study and the apparent relationship
between psychological distress and causal attributions are important observations in
informing appropriate health care interventions.

Middle Eastern women in this study underestimated their personal risk of developing
CHD and perceived themselves to be at increased risk of psychological disorders,
such as depression. Further, those who perceived some level of increased risk
attributed it highly to their psychological status rather life style factors. The study
participants were noted to experience similar challenges and hold similar
misconceptions as studies examining this issue in women. A range of cultural factors
further compounded these misconceptions and impeded the women’s capacity to
address CHD risk modification.

Underestimation of personal risk, inaccurate causal attributions, cultural
considerations and a lack of culturally and linguistically competent services to assist
women in protecting their heart were some identified barriers to risk reducing
behaviours among the study participants.

In order to reduce disparities in cardiovascular health, there is a critical need to
improve an accurate perception of CHD risk among minorities and women including
Middle Eastern women by using culturally and linguistically effective risk
communication methods. Further, tailored interventions are needed to overcome the identified barriers to risk reducing behaviours among Middle Eastern women. These interventions should take into account cultural diversities in health values and practices, health literacy and socio-economical status of the target population group. These interventions are believed to have a potential to bridge the gap between perceived and absolute CHD risk. Further, addressing stress in the life of these women emerged as a critical factor in planning life style modification to reduce CHD risk. General practitioners and cardiovascular nurses are poised to take a critical role in this process in the primary, secondary and tertiary health care settings.
References


REFERENCES


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REFERENCES


Glossary

**Cardiovascular disease**: This term refers to conditions involving the heart or blood vessels. The major manifestations of cardiovascular disease are coronary heart disease, stroke and peripheral arterial disease.

**Coronary heart disease**: Coronary heart disease refers to the narrowing or blockage of the coronary arteries caused by athermanous plaques within the walls of the arteries that supply myocardium and can lead to cardiac events.

**Cardiac events**: As used in this study refers to coronary events including myocardial infarction, angina pectoris, unstable angina, congestive heart failure and sudden cardiac death.

**CHD risk factors**: This refers to the factors which contribute to development of CHD and can either be modifiable such as hypertension, hyperlipidaemia and smoking or non-modifiable such as age, gender and family history.

**CHD risk reducing behaviours**: Undertaking methods to prevent or diminish the occurrence of coronary heart disease.

**Estimated absolute CHD risk**: The percentage chance of an individual experiencing a cardiovascular event during a definite period of time.

**Perceived personal absolute CHD risk**: Perception of one’s personal risk of developing heart disease during a definite period of time regardless of their actual risk involved.

**Perceived personal relative CHD risk**: Perception of one’s personal risk of developing heart disease during a definite period of time as compared with their peers.

**Culture and ethnicity**: The terms culture and ethnicity refer to combinations of socio-economic, religious and political qualities of human groups, including language, diet, dress, customs, kinship systems and historical or territorial identity.
Appendix A

Human Research Ethic Committee Approval
Appendix B

Patient Information Sheets and Consent Forms
Appendix C

Data Collection Instruments
<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
<th>Rating Scale</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I found myself getting upset by quite trivial things</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>I was aware of dryness of my mouth</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>I couldn't seem to experience any positive feeling at all</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>I experienced breathing difficulty (eg, excessively rapid breathing,</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>breathlessness in the absence of physical exertion)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I just couldn't seem to get going</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>I tended to over-react to situations</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>I had a feeling of shakiness (eg, legs going to give way)</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>I found it difficult to relax</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>I found myself in situations that made me so anxious I was most</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>relieved when they ended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>I felt that I had nothing to look forward to</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>I found myself getting upset rather easily</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>I felt that I was using a lot of nervous energy</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>I felt sad and depressed</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>I found myself getting impatient when I was delayed in any way</td>
<td>0 1 2 3</td>
<td></td>
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<tr>
<td></td>
<td>(eg, lifts, traffic lights, being kept waiting)</td>
<td></td>
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</tr>
<tr>
<td>15</td>
<td>I had a feeling of faintness</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>I felt that I had lost interest in just about everything</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>I felt I wasn't worth much as a person</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>I felt that I was rather touchy</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>I perspired noticeably (eg, hands sweaty) in the absence of high</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>temperatures or physical exertion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>I felt scared without any good reason</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>I felt that life wasn't worthwhile</td>
<td>0 1 2 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Question</td>
<td>0</td>
<td>1</td>
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<td>---</td>
<td>--------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>22</td>
<td>I found it hard to wind down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>I had difficulty in swallowing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>I couldn't seem to get any enjoyment out of the things I did</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>I was aware of the action of my heart in the absence of physical</td>
<td></td>
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<tr>
<td></td>
<td>exertion (eg, sense of heart rate increase, heart missing a beat)</td>
<td></td>
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<tr>
<td>26</td>
<td>I felt down-hearted and blue</td>
<td></td>
<td></td>
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<tr>
<td>27</td>
<td>I found that I was very irritable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>I felt I was close to panic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>I found it hard to calm down after something upset me</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>I feared that I would be &quot;thrown&quot; by some trivial but unfamiliar task</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>I was unable to become enthusiastic about anything</td>
<td></td>
<td></td>
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<tr>
<td>32</td>
<td>I found it difficult to tolerate interruptions to what I was doing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>I was in a state of nervous tension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>I felt I was pretty worthless</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>I was intolerant of anything that kept me from getting on with</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>what I was doing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>I felt terrified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>I could see nothing in the future to be hopeful about</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>I felt that life was meaningless</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>I found myself getting agitated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>I was worried about situations in which I might panic and make a</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>fool of myself</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>I experienced trembling (eg, in the hands)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>I found it difficult to work up the initiative to do things</td>
<td></td>
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</tr>
</tbody>
</table>
Lütfen aşağıdaki her ifadeyi okuyunuz ve bu ifadenin *son bir hafta içinde* sizin için ne kadar geçerli olduğunu olarak 0, 1, 2 veya 3’ü daire içine alınız. Doğru veya yanlış cevap diye birşey söz konusu değildir. İfadeler üzerinde çok zaman harcamayınız.

*Derecelendirme şu şekilde yapılmaktadır:*

0  Bana hiç uyumuyor
1  Bana bir derece uyuyor ya da az uyuyor
2  Bana önemli derece ya da orta miktarda uyuyor
3  Bana çok uyuyor ya da çoğu zamanlarda uyuyor

<table>
<thead>
<tr>
<th>İsim:</th>
<th>Tarih:</th>
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</thead>
<tbody>
<tr>
<td><strong>DAŞS-42</strong></td>
<td></td>
</tr>
<tr>
<td>Lütfen aşağıdaki her ifadeyi okuyunuz ve bu ifadenin <em>son bir hafta içinde</em> sizin için ne kadar geçerli olduğunu olarak 0, 1, 2 veya 3’ü daire içine alınız. Doğru veya yanlış cevap diye birşey söz konusu değildir. İfadeler üzerinde çok zaman harcamayınız.</td>
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**Derecelendirme şu şekilde yapılmaktadır:**

0  Bana hiç uyumuyor
1  Bana bir derece uyuyor ya da az uyuyor
2  Bana önemli derece ya da orta miktarda uyuyor
3  Bana çok uyuyor ya da çoğu zamanlarda uyuyor

1  Çok önemsiz şeylerin beni üzdüğüünü farkettim
2  Ağzım kuruyordu
3  Hiçbir şeyye olumlu olarak bakamıyorum
4  Nefes alma zorluğu çekiyordum (ör, aşırı hızlı nefes alma, fiziksel olarak zorlanma olmadığı halde nefes nefese kalma)
5  Bir türlü bir şeyler yapamıyorum sanki
6  Olan şeylere karşı gereğinden fazla tepki gösterme eğilimindeydim
7  Bende bir güçsüzlük hissi vardı (ör, bakımların birden kendini bırakması)
8  Dinlenmekte zorluk çekiyordum
9  Bazen çok korktuğum durumlar oluyordu ve bu durumlar sona erdiğiinde çok rahatlıyordum
10  Gelecekten hiç ümidim yokmuş gibi hissediyordum
11  Kolayca üzülüyordum
12  Oldukça gergin oluyordum
13  Kendimi üzgün ve çıkmış gibi hissediyordum
14  Herhangi bir şekilde bekletildiğim zaman sabırsızlanmaya başlayordum (ör, asansör, trafik ışıkları, bekletilmek)
15  Bayılacak gibi oluyordum
16  Hemen hemen her şeye karşı olan ilgimi kaybetmiş gibiydim
17  Bir insan olarak fazla bir değerim yok diye düşünüyordum
18  Oldukça alıngandım
19  Hava sıcak olmadığı halde ya da fiziksel olarak bir şey yapmamadığım halde, ciddi derecede terliyordum (ör, ellerin terlemesi)
20  Önemli bir neden olmadığı halde korkuyordum
21  Hayatin değeri olmadığını düşünüyoruz

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<thead>
<tr>
<th>İsim:</th>
<th>Tarih:</th>
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<td><strong>DAŞS-42</strong></td>
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<tr>
<td>Lütfen aşağıdaki her ifadeyi okuyunuz ve bu ifadenin <em>son bir hafta içinde</em> sizin için ne kadar geçerli olduğunu olarak 0, 1, 2 veya 3’ü daire içine alınız. Doğru veya yanlış cevap diye birşey söz konusu değildir. İfadeler üzerinde çok zaman harcamayınız.</td>
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**Derecelendirme şu şekilde yapılmaktadır:**

0  Bana hiç uyumuyor
1  Bana bir derece uyuyor ya da az uyuyor
2  Bana önemli derece ya da orta miktarda uyuyor
3  Bana çok uyuyor ya da çoğu zamanlarda uyuyor

1  Çok önemsiz şeylerin beni üzdüğüünü farkettim
2  Ağzım kuruyordu
3  Hiçbir şeyye olumlu olarak bakamıyorum
4  Nefes alma zorluğu çekiyordum (ör, aşırı hızlı nefes alma, fiziksel olarak zorlanma olmadığı halde nefes nefese kalma)
5  Bir türlü bir şeyler yapamıyorum sanki
6  Olan şeylere karşı gereğinden fazla tepki gösterme eğilimindeydim
7  Bende bir güçsüzlük hissi vardı (ör, bakımların birden kendini bırakması)
8  Dinlenmekte zorluk çekiyordum
9  Bazen çok korktuğum durumlar oluyordu ve bu durumlar sona erdiğiinde çok rahatlıyordum
10  Gelecekten hiç ümidim yokmuş gibi hissediyordum
11  Kolayca üzülüyordum
12  Oldukça gergin oluyordum
13  Kendimi üzgün ve çıkmış gibi hissediyordum
14  Herhangi bir şekilde bekletildiğim zaman sabırsızlanmaya başlayordum (ör, asansör, trafik ışıkları, bekletilmek)
15  Bayılacak gibi oluyordum
16  Hemen hemen her şeye karşı olan ilgimi kaybetmiş gibiydim
17  Bir insan olarak fazla bir değerim yok diye düşünüyordum
18  Oldukça alıngandım
19  Hava sıcak olmadığı halde ya da fiziksel olarak bir şey yapmamadığım halde, ciddi derecede terliyordum (ör, ellerin terlemesi)
20  Önemli bir neden olmadığı halde korkuyordum
21  Hayatin değeri olmadığını düşünüyoruz

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<th>Turkish Statement</th>
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<td>Dinlenmekte zorluk çekiyordum</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>23</td>
<td>Yutkunmakta zorlanıyordu</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>24</td>
<td>Yaptığım şeylerden hiç bir zevk alamıyordu sanki</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>25</td>
<td>Fiziksel bir zorlanma olmadığı halde, kalp atışlarında değişiklik hissediyordum (ör, kalp atışlarının artması hissi, kalp atışlarında arada bir kalbin atmaması)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>26</td>
<td>Kendimi çok üzgün ve gelecektenden umitsiz hissediyordum</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>27</td>
<td>Çok kolay incinir oldum</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>28</td>
<td>Paniğe kapılacak gibiydim</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>29</td>
<td>Bir şey üzüldükten sonra kolay kolay sakinleşemiyordum</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>30</td>
<td>Önemsi olan ve bilmediğim bir şeyin beni ‘alt-üst’ ededeğinden korkuyordum</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>31</td>
<td>Hiç bir şeye karşı hevesli olamıyor</td>
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<tr>
<td>32</td>
<td>Yaptığım şeylerle karşıılmasına tahammül etmekte zorlanıyordu</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>33</td>
<td>Sınırlı harpi yaşiyordum</td>
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<tr>
<td>34</td>
<td>Çok deersiz oldugumunu düşünüyor</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>35</td>
<td>Bir şeyler yaparken rahatsız edilmeye tahammül edemiyordum</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>36</td>
<td>Korkuyordum</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>37</td>
<td>Gelecektenden umitli olmak için bir sebep göremiyordum</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>38</td>
<td>Hayatin anlamsız oldugunu düşüniyor</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>39</td>
<td>Kolay tahrik ediliyordum</td>
<td>0 1 2 3</td>
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<tr>
<td>40</td>
<td>Paniğe kapılabileceğim ya da kendimi bir aptal durumuna sokacağım gibi hallerden korkuyordum</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>41</td>
<td>Titriyordum (ör, ellerde titreme)</td>
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</tr>
<tr>
<td>42</td>
<td>Bir şeyler yapmak için istahim yoktu</td>
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<tr>
<td>آمار</td>
<td>(آسم)</td>
<td>(تاریخ)</td>
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<td>------</td>
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<td>--------</td>
</tr>
<tr>
<td>1</td>
<td>شاید اجنه و اکثر مواقع در صداقت نمی‌گردد</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>نمی‌توانست تواصلات و کاره انجام دهد</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>احساس می‌کردم یک دفعه ای نگران می‌خورم (بطور مثال نگران خودن یا)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>موقتی هایی وجود داشت که مرا بسیار مضطرب می‌کرد و بعد از رهایی از آنها</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>احساس می‌کردم چیزی ندارم که به آن ایماندار باشم.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>احساس می‌کردم که انتزاعی عصبی زیادی را مصرف می‌کنم.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>احساس غمگین و افسردگی می‌کرد.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>اگر چیزی به تأخیر می‌افتد اعصاب خرد می‌شده (بطور مثال برای اسنانور، نفرات)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>قرمز یا مواقفی که منظم نگه می‌دارند</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>احساس ضعف می‌کرد.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>احساس می‌کرد که علاقه خود را نسیت به همه چیز از دست داده است.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>احساس می‌کردم هیچ ارزشی ندارم.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>احساس می‌کردم زود رنج شده است.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>در مواقع که نما با زندگی و یا تحرک جسمی ناشی از عرق می‌کردم (مثل عرق کف دست)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>بدن دلیل احساس ترس می‌کرد.</td>
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</tr>
<tr>
<td>16</td>
<td>احساس می‌کردم زندگی ارزشی ندارد.</td>
<td></td>
</tr>
</tbody>
</table>

لطفا عبارات زیر را به دقت بخوانید و یکی از گزینه‌های را که در طول هفته گشته در مورد شما بیشتر صدق می‌کرد را با مقیاس های یا تعامل بزنید. پاسخ صحیح یا غلط وجود ندارد. وقت زیادی را صرف یک عبارت نکنید.
یادواز residency
- اصلا در مردم قصد نمی‌گردد.
- تا هدفی یا تهدید وقت‌ها در مردم قصدی کرد.
- تا حدی که جهتی یا دسترسی وقت‌ها در مردم قصدی کرد.
- خلیف زیادی از مردم قصدی کرد.

رفع خستگی بعد از فعالیت بکار رفته بود.
در بغل مشکل داشت.
از کارهایی که بعنوان تغییرات بین سیاست های لزوم و ضرورت خود را احساس می‌کرد (برای مثال علی‌قلی یا احساس نا منظم و پذیرفته با قلب).
احساس دلتانگی و غمگینی می‌کرد.
احساس می‌کرد خستگی زود از کوه در می‌روید (اصابتی شوم).
احساس می‌کرد که زندگانی است از ترس و شخت‌کن.
اگر از چیزی ناراحت می‌شدم نمی‌توانستم خودمندی خودم را حفظ کنم.
از انجام کارهایی که ایجاد خسارت هر چند جزئی می‌ترسیدم,
نمی‌توانستم خودم را به چیزی علاقمند کنم.
تحمل هر چیزی که در کارم داخل ایجاد می‌کرد براهم بود.
در بغل حالتش عصبی به سر می‌برم.
احساس می‌کرد خستگی بی ارزش بود.
اگر چیزی منع ایجاد کارم می‌شد نمی‌توانستم آن را تحمل کنم.
احساس و شخت می‌کرد.
چیزی در ایندیه برای خود نمی‌دهم که به آن امیدوار باشم.
احساس می‌کرد که زندگی بی معنی است.
احساس نگرانی و اشکات می‌کرد.
نگران موقعیت های بوده ومی‌کند بوده ولی شده و دست و پا چلیده به نظر برسم.
لرزش دائمی (به طور مناسب در سخت‌ها).
شرود هر کار تازه یا براهم سخت بود.
1. Study No □
2. Participant No □□□
3. Date: □□ □□ □□
    (Day/month/year)

**Demographical profile**

4. Marital Status:  □1 Never Married  □2 Married  □3 Separated  □4 Divorced  □5 Widowed

5. Post code: □□□□

6. Do you live in:  □1 Your own home  □2 Rental home  □3 Hostel  □4 Nursing home  □5 Other …………………

7. Do you currently work outside the home?  □1 Yes  □0 No
    *If no, go to Question 11*

8. How many hours do you work outside the home? …………………

9. Is this job:  □1 Permanent  □2 Casual

10. Is this job:  □1 Full time  □2 Part time

11. Do you have private health insurance (other than Medicare) for yourself?  □1 Yes  □0 No
    (eg MBF, HCF)

12. How adequate is your income to meet all of your expenses? (Select one)
    □1 Not adequate  □2 Barely Adequate  □3 Adequate  □4 More than adequate
### - Education

13. Total number of formal schooling years completed: .................................

14. Highest education completed *(Select only one)*:

- □ 0 Never attended school
- □ 1 Primary School (< 7 years of school)
- □ 2 Secondary School (< 10 years of school)
- □ 3 Secondary School (< 13 years of school)
- □ 4 Trade School
- □ 5 University degree

15. Country of birth: .................................


17. Country of birth of father: ........................

18. If you were not born in this country, how many years have you been living in this country? ................................. (number of years)

If you were born in this country, how many generations of your family also have been in this country?

19. Paternal: ................................. (number of generations)

20. Maternal: ................................. (number of generations)

21. Self-identified ethnic identity? .................................

   (Arabic, Turkish, Persian)

22. What is your religion? ..........................................................

23. Do you have someone who helps take care of you at home?  □ 1 Yes □ 0 No

   *If no, go to Question 25*

24. Is this person:

- □ 1 Male family member living with you
- □ 2 Male family member not living with you
- □ 3 Female family member living with you
- □ 4 Female family member not living with you
- □ 5 Friend living with you
- □ 6 Friend not living with you
- □ 7 Community service member

   (You may tick more than one box)

25. Total number of persons you care for in the home? .................................

   (e.g. spouse, parents, children, others)

26. Total number of persons you care for outside the home? .................................

   (e.g. spouse, parents, children, others)
## Risk factor Profile

27. Age: 

<table>
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<tr>
<th>- FAMILY MEDICAL HISTORY</th>
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<tr>
<td>Do you have familial history of:</td>
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<tr>
<td>28. heart disease?</td>
</tr>
<tr>
<td>29. stroke?</td>
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<tr>
<td>30. diabetes?</td>
</tr>
<tr>
<td>31. renal (kidney) disease?</td>
</tr>
<tr>
<td>32. familial history of cancer?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>- PERSONAL MEDICAL HISTORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have personal history of:</td>
</tr>
<tr>
<td>33. heart disease?</td>
</tr>
<tr>
<td>34. hypertension?</td>
</tr>
<tr>
<td>35. hyperlipidemia?</td>
</tr>
<tr>
<td>36. stroke?</td>
</tr>
<tr>
<td>37. diabetes?</td>
</tr>
<tr>
<td>38. renal disease?</td>
</tr>
<tr>
<td>39. cancer?</td>
</tr>
</tbody>
</table>

40. What are your current medications? ............................................

41. When was your last visit to your doctor? .....................................
- SMOKING

42. Do you presently smoke cigarettes? □ 1 Yes □ 0 No

43. Did you quit smoking in the last 12 months? □ 1 Yes □ 0 No

* If you don’t presently smoke, go to Question 50.

44. How soon after waking up do you smoke your first cigarette? □ 3 Within 5 minutes □ 2 < 30 minutes □ 1 > 30 minutes □ 0 > 60 minutes

45. Do you find it difficult not to smoke in places where it is forbidden? (eg Church, Library, etc)? □ 1 Yes □ 0 No

46. Which cigarette would you hate to give up? □ 1 The first one in the morning □ 0 Any other

47. How many cigarettes a day do you smoke? □ 0 10 or less □ 1 11 to 20 □ 2 21 to 30 □ 3 31 or more

48. Do you smoke more frequently in the morning than the rest of day? □ 1 Yes □ 0 No

49. Do you smoke even though you are sick in bed for most of the day? □ 1 Yes □ 0 No
APPENDIX C  
CHD RISK FACTOR QUESTIONNAIRE- VERSION A

-Alcohol

50. Do you drink alcohol?  
   ☐ 1 Yes  
   ☐ 0 No

-INACTIVITY

51. Which one of the items below best describes your physical activity?
   ☐ 1 Moderate physical activity at least 30 minutes most or all days of the week  
   ☐ 2 Moderate physical activity less 30 minutes less than 5 days in a week  
   ☐ 3 Not physically active

-BLOOD PRESSURE (at the time of administration of the questionnaire)

52. Systolic BP.............mmHg
53. Diastolic BP.............mmHg

-BMI

54. Weight.............kg
55. Height.............cm
56. Hip circumference.............cm
57. Waist circumference.............cm
- **LIPID PROFILE**

58. Total Cholesterol...........mmol/L
59. LDL........................mmol/L
60. HDL ........................mmol/L
61. Triglyceride ............... mmol/L
62. Apoprotein A................g/L
63. Apoprotein B................g/L

- **SERUM GLUCOSE PROFILE**

64. Blood Glucose.............mmol/L
65. HbA1C.................%

- **RENAL FUNCTION**

66. Serum creatinine...........mmol/L
67. GFR.....................mL/min/1.73m²
1. Study No □
2. Participant No □□□
3. Date: □□ □□ □□
   (Day/month/year)

### Demographical profile

4. Marital Status: □1 Never Married  
   □2 Married  
   □3 Separated  
   □4 Divorced  
   □5 Widowed

5. Post code: □□□□

6. Do you live in: □1 Your own home  
   □2 Rental home  
   □3 Hostel  
   □4 Nursing home  
   □5 Other……………..

7. Do you currently work outside the home? □1 Yes  
   □0 No  
   *If no, go to Question 11*

8. How many hours do you work outside the home? …………………

9. Is this job: □1 Permanent  
   □2 Casual

10. Is this job: □1 Full time  
    □2 Part time

11. Do you have private health insurance (other than Medicare) for yourself? (eg. MBF, HCF) □1 Yes  
    □0 No

12. How adequate is your income to meet all of your expenses? (Select one)  
    □1 Not adequate  
    □2 Barely Adequate  
    □3 Adequate  
    □4 More than adequate
13. Total number of formal schooling years completed:  

14. Highest education completed (Select only one):  
   - 0 never attended school  
   - 1 Primary School (< 7 years of school)  
   - 2 Secondary School (< 10 years of school)  
   - 3 Secondary School (< 13 years of school)  
   - 4 Trade School  
   - 5 University  

15. Country of birth:  

16. What is your religion?  

17. Do you have someone who helps take care of you at home?  
   - 1 Yes  
   - 0 No  
   
   *If no, go to Question 19*  

18. Is this person:  
   - 1 Male family member living with you  
   - 2 Male family member not living with you  
   - 3 Female family member living with you  
   - 4 Female family member not living with you  
   - 5 Friend living with you  
   - 6 Friend not living with you  
   - 7 Community service member  
   
   (You may tick more than one box)  

19. Total number of persons you care for in the home?  
   (e.g. spouse, parents, children, others)  

20. Total number of persons you care for outside the home?  
   (e.g. spouse, parents, children, others)
## Risk factor Profile

21. **Age:**

### Do you have familial history of:

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. heart disease?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>23. stroke?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>24. diabetes?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>25. renal (kidney) disease?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>26. familial history of cancer?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

27. Do you have personal history of hypertension?
   - ☐ Yes
   - ☐ No
   - ☐ Don’t know

28. Do you take medication for high blood pressure?
   - ☐ Yes
   - ☐ No

29. Do you have personal history of hypercholesterolemia?
   - ☐ Yes
   - ☐ No
   - ☐ Don’t know

30. Do you take medication for high blood cholesterol?
   - ☐ Yes
   - ☐ No

31. Do you have personal history of diabetes?
   - ☐ Yes
   - ☐ No
   - ☐ Don’t know

32. Do you take medication for diabetes?
   - ☐ Yes
   - ☐ No

33. Do you have personal history of stroke?
   - ☐ Yes
   - ☐ No
   - ☐ Don’t know

34. Do you have personal history of renal (kidney) disease?
   - ☐ Yes
   - ☐ No
   - ☐ Don’t know

35. Do you have personal history of cancer?
   - ☐ Yes
   - ☐ No
   - ☐ Don’t know
36. Do you drink alcohol?  
   - 1 Yes  
   - 0 No

37. Which one of the items below best describes your physical activity?  
   - 1 Moderate physical activity at least 30 minutes most or all days of the week  
   - 2 Moderate physical activity less 30 minutes less than 5 days in a week  
   - 3 Not physically active

### SMOKING

38. Do you presently smoke cigarettes?  
   - 1 Yes  
   - 0 No

39. Did you quit smoking in the last 12 months?  
   - 1 Yes  
   - 0 No

*If you don’t presently smoke, go to Question 47*

40. How soon after waking up do you smoke your first cigarette?  
   - 3 Within 5 minutes  
   - 2 < 30 minutes  
   - 1 > 30 minutes  
   - 0 > 60 minutes

41. Do you find it difficult not to smoke in places where it is forbidden, eg Library, etc)?  
   - 1 Yes  
   - 0 No

42. Which cigarette would you hate to give up?  
   - 1 The first one in the morning  
   - 0 Any other

43. How many cigarettes a day do you smoke?  
   - 0 10 or less  
   - 1 11 to 20  
   - 2 21 to 30  
   - 3 31 or more

44. Do you smoke more frequently in the morning than the rest of day?  
   - 1 Yes  
   - 0 No

45. Do you smoke even though you are sick in bed for most of the day?  
   - 1 Yes  
   - 0 No
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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</thead>
<tbody>
<tr>
<td>46. What is your diagnosis?</td>
<td></td>
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<tr>
<td>47. What do you think of the cause of your heart disease?</td>
<td></td>
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<tr>
<td>48. Have you ever attend a cardiac rehabilitation program?</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No application</td>
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<tr>
<td>49. What is the participants’ diagnosis of heart disease?</td>
<td></td>
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<tr>
<td>50. What are documented CVD risk factors of the participant?</td>
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<tr>
<td>51. Weight</td>
<td>kg</td>
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<tr>
<td>52. Height</td>
<td>cm</td>
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<tr>
<td>53. Hip circumference</td>
<td>cm</td>
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<tr>
<td>54. Waist circumference</td>
<td>cm</td>
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<tr>
<td>55. Systolic BP</td>
<td>mmHg</td>
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<td>56. Diastolic BP</td>
<td>mmHg</td>
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<tr>
<td>57. Total Cholesterol</td>
<td>mmol/L</td>
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<tr>
<td>58. LDL</td>
<td>mmol/L</td>
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<td>59. HDL</td>
<td>mmol/L</td>
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<td>60. Triglyceride</td>
<td>mmol/L</td>
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<tr>
<td>61. Blood glucose</td>
<td>mmol/L</td>
</tr>
<tr>
<td>62. Serum creatinine</td>
<td>mg/dL</td>
</tr>
<tr>
<td>63. BUN</td>
<td>mg/dL</td>
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</tbody>
</table>
Participant No □□□

1. Do you know anyone with heart disease?  □1 Yes
                                              □0 No

2. If your answer is yes, what is your relationship with this person?
   □1 husband
   □2 parents
   □3 brother or sister
   □4 friend
   □5 colleagues
   □6 neighbourhood
   □7 other

Are the below questions true or false?

3. Heart disease is the most common cause of death in women in Australia?  □1 true
                                                                 □0 false

4. Almost all heart attacks occur in people over the age of 65?  □1 true
                                                            □0 false

************

Please read each statement below and circle a number from 0-10 which indicates
your beliefs and perceptions about the contribution of each statement to development
of heart disease.

5. If a woman has high blood pressure, how likely do you think it is that high blood
pressure increases her risk of developing a heart problem?

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Very Unlikely          Not sure          Likely

6. If a woman smokes, how likely do you think it is for heart disease to happen?

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<td>9</td>
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</table>

Very Unlikely          Not sure          Likely
7. If a woman exercises for at least 30 minutes most days of the week, how much do you think it will help her heart health?

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</table>
Very Unlikely | Not sure | Likely  |

8. Do you think that being overweight increases a woman’s risk of developing heart problem?

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</table>
Very Unlikely | Not sure | Likely  |

9. Do you think that the type of food a woman eats affects her risk of developing heart disease?

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<td>7</td>
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</table>
Very Unlikely | Not sure | Likely  |

10. Do you think diabetes increases a woman’s risk of developing a heart problem?

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</table>
Very Unlikely | Not sure | Likely  |

11. Do you think that being anxious, stressed or depressed increases a woman’s risk of developing a heart problem?

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Very Unlikely | Not sure | Likely  |
13. Do you think that the risk of heart disease increases after menopause in women?

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Very Very Unlikely Not sure Likely

14. Do you think that as women grow older, their risk of heart disease increases?

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Very Very Unlikely Not sure Likely

15. Do you think that moving to another country increases the risk of developing heart problem in women?

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Very Very Unlikely Not sure Likely

16. How likely is it for you to have a heart problem in the next 5 years?

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17. Compared to women in your same age group, how likely is it that you could develop a heart problem in the next 5 years?

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Very Very Unlikely Not sure Likely

18. How likely is it for you to have a heart problem in the next 10 years?

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Very Very Unlikely Not sure Likely
19. Compared to women in your same age group, how likely is it that you could develop a heart problem in the next 10 years?

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Very Unlikely | Not sure | Very Likely

20. How important is it for you to reduce your risk of heart disease?

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Not Very Important | Not sure | Very Important

21. How confident are you that engaging heart healthy behaviours or reducing your risk factors of heart disease protects you from heart disease? (Such as exercising or eating low fat diet)

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Not Very Confident | Not sure | Very Confident

22. How confident are you that you will be able to reduce your risk of heart disease as a whole?

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Not Very Confident | Not sure | Very Confident
1. Do you know anyone with heart disease? ■1 Yes ■0 No

2. If your answer is yes, what is your relationship with this person?
   ■1 husband
   ■2 parents
   ■3 brother or sister
   ■4 friend
   ■5 colleagues
   ■6 neighbourhood
   ■7 other

Are the below questions true or false?

3. Heart disease is the most common cause of death in women in Australia? ■1 true ■0 false

4. Almost all heart attacks occur in people over the age of 65? ■1 true ■0 false

* Please read each statement below and circle a number from 0-10 which indicates your beliefs and perceptions about the contribution of each statement to development of heart disease.

5. If a woman has high blood pressure, how likely do you think it is that high blood pressure increases her risk of developing a heart problem?

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   Very Unlikely Not sure Likely

6. If a woman smokes, how likely do you think it is for heart disease to happen?

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   Very Unlikely Not sure Likely
7. If a woman exercises for at least 30 minutes most days of the week, how much do you think it will help her heart health?

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*Very unlikely* | *Not sure* | *Likely*

8. Do you think that being overweight increases a woman’s risk of developing heart problem?

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*Very unlikely* | *Not sure* | *Likely*

9. Do you think that the type of food a woman eats affects her risk of developing heart disease?

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*Very unlikely* | *Not sure* | *Likely*

10. Do you think diabetes increases a woman’s risk of developing a heart problem?

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*Very unlikely* | *Not sure* | *Likely*

11. Do you think that being anxious, stressed or depressed increases a woman’s risk of developing a heart problem?

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*Very unlikely* | *Not sure* | *Likely*
### APPENDIX C PERCEPTION OF RISK QUESTIONNAIRE - VERSION B

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<th>Question</th>
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<td>13. Do you think that the risk of heart disease increases after menopause in women?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td>Very Unlikely</td>
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<td>Not sure</td>
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<td>Likely</td>
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<tr>
<td>14. Do you think that as women grow older, their risk of heart disease increases?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td>Very Unlikely</td>
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<tr>
<td>15. How likely is it for you to have a heart problem in the next 5 years?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td>Very Unlikely</td>
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<td>Not sure</td>
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<td>16. Compared to women in your same age group, how likely is it that you could develop another heart problem in the next 5 years?</td>
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<td>Very Unlikely</td>
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<td>17. How likely is it for you to have another heart problem in the next 10 years?</td>
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<td>18. How severe do you think your heart problem is?</td>
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19. Compared to women in your same age group, how likely is it that you could develop another heart problem in the next 10 years?

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20. How important is it for you to reduce your risk of developing another heart event?

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21. How confident are you that engaging heart healthy behaviours or reducing your risk factors of heart disease protects you from another heart event? (Such as exercising or eating low fat diet)

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22. How confident are you that you will be able to reduce your risk of another heart event as a whole?

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1. What are the most important health issues for women in your community?

2. What do you know about heart disease?

3. What are the causes of heart disease?

4. How do you perceive yourself at the risk of developing heart diseases in future?

5. How do you protect your heart?

6. What barriers do you perceive in protecting your heart?

7. What would you say to policy makers, insurance plan administrators, public health officials, or other health care providers about how they can better meet your needs or the needs of other women you know?
### Classification of CVD Risk in Women

<table>
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<th>Risk Status</th>
<th>Criteria</th>
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| High risk     | Established coronary heart disease  
                Cerebrovascular disease  
                Peripheral arterial disease  
                Abdominal aortic aneurysm  
                End-stage or chronic renal disease  
                Diabetes mellitus  
                10-Year Framingham global risk > 20%** |
| At risk       | ≥1 major risk factors for CVD,  
                Cigarette smoking  
                Poor diet  
                Physical inactivity  
                Obesity, especially central adiposity  
                Family history of premature CVD (CVD at <55 years of age in male relative and <65 years of age in female relative)  
                Hypertension  
                Dyslipidemia  
                Evidence of subclinical vascular disease  
                (eg, coronary calcification)  
                Metabolic syndrome  
                Poor exercise capacity on treadmill test and/or abnormal heart rate recovery after stopping exercise |
| Optimal risk  | Framingham global risk < 10% and a healthy lifestyle, with no risk factors |

*CVD indicates cardiovascular disease.

**Or at high risk on the basis of another population-adapted tool used to assess global risk.

Appendix D

Advertisement/Radio Transcript
Appendix E

Steering Committee Terms of Reference and Membership
1. Background / Context

Cardiovascular diseases remain the leading cause of death in Australia (37.6% all deaths). Although there has been a decline in mortality rate due to CVD in the past 25 years, attributed mainly to the improvements in medical management and to the lower prevalence of behaviours associated with the development of heart disease, such as smoking (Cardiovascular Health In Australia, 1994), the decline has been less in women than men. In other words, there has been a shift in the burden of heart disease to elderly women in the population. Although CVD is the number one killer of women in Australia, and death from this disease is 5 times as many deaths from breast cancer, women perceive cancer as the most threatening disease.

Despite the convincing evidence and the increased availability of cardiac rehabilitation programs, the reports highlight suboptimal rates of referral to and utilisation of outpatient cardiac rehabilitation programs in most countries, particularly in women. More over, ethnic differences and other socioeconomic factors are associated with decreased likelihood of undergoing secondary prevention of CVD programs. However, Risk reduction programs work in all people. Even though people have many individual characteristics that affect the
power some of these risk factors, all people from different cultural groups will respond to
efforts to reduce risk. These programs should be prepared to meet the needs of culturally
diverse patients.

Perceptions variables are conceptualized as a set of indicators that are representative of the
concerns by which women may be influenced when deciding to participate or not to
participate in CR, as service providers do not necessarily think in the same way as ethnic
communities about what constitutes illness. Health massages try to motivate eligible people
to change their risky lifestyle, but adapting strategies with cultural sensitivity is needed if
we want to get a good result.

2. Function of the MIDDLE EASTERN WOMEN’S PROJECT Steering
Committee

The Function of the Middle Eastern Women’s Project Steering Committee is to provide
expert advice associated with the Middle Eastern Women’s Project. The Steering Committee
is responsible for guiding the Project Team in approving budgetary strategy, defining and
realising benefits, and monitoring risks, quality and timeliness.

3. Role of the MIDDLE EASTERN WOMEN’S PROJECT Steering
Committee

The Role of the Middle Eastern Women’s Project Steering Committee is to:

- provide advice on the project’s feasibility, business plan and achievement of
  outcomes;
- ensure the project’s scope aligns with the requirements of the stakeholder groups;
- provide those directly involved in the project with guidance on project business
  issues and matters pertaining to the Middle Eastern Women’s Project.
- ensure effort and expenditure are appropriate to stakeholder expectations;
- address any issue that has major implications for the project;
- keep the project scope under control as emergent issues force changes to be
  considered;
- Provide advice regarding differences in opinion and approach.

4. Role of individual Steering Committee members

The Role of the individual members of the Middle Eastern Women’s Project Steering
Committee includes:
• understanding the strategic implications and outcomes of initiatives being pursued through project outputs;
• appreciating the significance of the project for some or all major stakeholders and perhaps represent their interests;
• being genuinely interested in the initiative and the outcomes being pursued in the project;
• being an advocate for the project's outcomes;
• having a broad understanding of project management issues and the approach being adopted; and
• being committed to, and actively involved in pursuing the project's outcomes.

In practice, this means they:

• ensure the project is conducted according to the agreed proposal
• establish and foster an effective relationship with the committee members based on trust and mutual respect for each other’s roles.
• ensure the requirements of stakeholders are met by the project's outputs;
• provide guidance to the Project Team and users of the project's outputs;
• appraise and review ideas and issues raised from project outcomes;
• review the progress of the project and implications for stakeholders
• monitor adherence of project activities to standards of best practice and the potential to meet the needs of key stakeholder groups

5. General

5.1 Membership

See below.

5.2 Steering Committee Chair

The Chair, Associate Professor Patricia Davidson shall convene the Middle Eastern Women’s Project Steering Committee meetings. The responsibility of the Chair will be to ensure that:

1. the project is conducted according to the agreed proposal
2. meetings occur in a timely fashion and all key stakeholders are informed of processes
3. all members have an equal opportunity to participate in discussion and decision-making
4. effective relationships with the committee members based on trust and mutual respect for each other’s roles is developed among key stakeholders.

If the designated Chair is not available, Gordana Kostadinovska (Acting Chair) will be responsible for convening and conducting that meeting. The Acting Chair will be responsible for informing the Chair as to the salient points/decisions raised or agreed to at that meeting.
5.3 Agenda Items

All Middle Eastern Women’s Project Steering Committee agenda items must be forwarded to Leila Gholizadeh the by C.O.B. seven working days prior to the next scheduled meeting.

The Middle Eastern Women’s Project Steering Committee agenda, with attached meeting papers will be distributed at least seven working days prior to the next scheduled meeting.

5.4 Minutes & Meeting Papers

The minutes of each Middle Eastern Women’s Project Steering Committee meeting will be prepared by Regan Jenkins under the supervision of the Project Manager, Leila Gholizadeh.

Full copies of the minutes, including attachments, shall be provided to all Middle Eastern Women’s Project Steering Committee members no later than ten working days following each meeting.

All out-of-session decisions made by the Project Team shall be recorded in the minutes of the next scheduled Middle Eastern Women’s Project Steering Committee meeting.

The minutes of each Middle Eastern Women’s Project Steering Committee meeting will be monitored and maintained by Associate Professor Davidson and copies supplied to Gordana Kostadinovska.

5.5 Frequency of Meetings

The Middle Eastern Women’s Project Steering Committee shall meet three monthly.

*Further information may be necessary if the Steering Committee agree to consider out-of-session decisions.*

5.6 Proxies to Meetings

Members of the Middle Eastern Women’s Project Steering Committee are able to nominate a proxy to attend the meeting if the member is unable to attend.
The Chair will be informed of the substitution at least two working days prior to the scheduled nominated meeting.

5.7 Quorum Requirements

The requirements for a quorum that can make and ratify decisions by the Steering Committee should be stated. This allows the Steering Committee to be clear on whether there is official sanction of decisions.

A minimum of four of the Middle Eastern Women’s Project Steering Committee members is required for the meeting to be recognised as an authorised meeting for the recommendations or resolutions to be valid.
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<thead>
<tr>
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<tr>
<td>Prof.</td>
<td>Patricia</td>
<td>Davidson</td>
<td>Cardiovascular and Chronic Care</td>
<td>Co-chair</td>
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<td><a href="mailto:Gordana_Kostadinovska@wsahs.nsw.gov.au">Gordana_Kostadinovska@wsahs.nsw.gov.au</a></td>
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<td>Lamb</td>
<td>Women’s Health Adviser, WSAHS</td>
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