Socioeconomic, Cognitive, and Behavioural Variables Concerning Coronary Heart Disease from the Urban Population of Bangladesh

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Authorship and Access

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______________________________________________________________
Nishat-E-Sharmin Trisha

Date: ________________________________
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Ethics Approvals

Permission to conduct this research was sought from, and granted by the following:

Charles Sturt University’s Human Research Ethics Committee, approval number 2013/025.

Research Review Committee of the Centre for the Control of Chronic Diseases at the International Centre for Diarrheal Diseases and Research, Bangladesh (ICDDR, B) PR-14071

See Appendix A.
Abstract

Context:
Coronary heart disease (CHD) is one of the leading causes of death in Bangladesh and is a disease of both high socioeconomic status (HSES) and low socioeconomic status (LSES) people. Knowledge and awareness about CHD are important prerequisites for the general population to modify their lifestyle practices and reduce CHD risk. Despite a growing prevalence of CHD, nothing is known about CHD knowledge and awareness, and little about lifestyle practices, among the Bangladeshi population based on their socioeconomic status.

Aims:
The aim of this study was to assess and compare knowledge and awareness about CHD among people from HSES and LSES groups in Bangladesh and to determine the relationship between knowledge and awareness about CHD and lifestyle practices.

Method:
A cross-sectional study was carried out in Dhaka city, Bangladesh. The study sample consisted of a total of 478 participants, among whom 238 were of HSES and 240 were of LSES. Participants from either the HSES or LSES were selected using an appropriate random sampling technique. A validated questionnaire was used to collect data concerning knowledge and awareness about CHD and lifestyle practices of the participants. Data were collected for four months from September to December in 2014.

Result:
The difference between knowledge score of HSES and LSES groups was highly significant, \( t (475.9) = 24.66, p < .001, 95\% \text{ CI} [8.389, 9.841] \). Results indicated that there was a poor level of CHD knowledge among HSES participants and a very poor level for the LSES participants with a mean ± SD of 18.77 ± 4.0 and 9.66 ± 4.1, respectively, out of a maximum possible score of 54. Similar to knowledge, both HSES and LSES groups had a lack of awareness about CHD. However, people of HSES had a better awareness (9.5 ± 3.1) about CHD than did those of LSES (6.06 ± 2.6) out of a maximum score of 20. Results showed a significant difference between the groups for
awareness being $t(463.01) = 13.20, p < .001, 95\% \text{ CI } [2.928, 3.951]$. However, both socioeconomic groups had a good lifestyle score out of a possible maximum of 5 (HSES 3.63 ± 0.55 vs LSES 3.53 ± 0.68), with no significant difference between the two groups, $t(458.89) = 1.696, p = .090, 95\% \text{ CI } [-0.015, 0.207]$. 

Correlation analyses revealed that knowledge and awareness about CHD were associated with each other in both groups. In contrast, lifestyle practices were not correlated with either knowledge about CHD or awareness in either group. Further analysis using multiple regressions indicated that knowledge about CHD was associated with socioeconomic status and age, and, awareness about CHD was associated with socioeconomic status and gender. Lifestyle practice was associated with socioeconomic status and age.

**Conclusion:**

The results showed, in spite of having poor level of knowledge and awareness about CHD, that participants of both groups maintained a good lifestyle practice. This indicated that only knowledge and awareness about CHD are not sufficient in outlining an individual’s lifestyle practice; contributions of socioeconomic, sociocultural and environmental factors also have an important role in adapting lifestyle practices. These findings could make a valuable contribution for effective primary and secondary preventive strategies by assisting government policy makers to tailor public campaigns specifically to particular groups.
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1.1 Introduction

In this thesis, the cognitive variables comprising knowledge and awareness, and lifestyle practices related to coronary heart disease (CHD), were compared between two socioeconomic status (SES) groups in the city of Dhaka in Bangladesh. In this introductory chapter, I describe the context of the study, the world-wide burden of CHD including the burden in Bangladesh, the sociodemographic background of the country, and the health context of Bangladesh. This chapter also contains a brief description of CHD and its risk factors within Bangladesh, and how CHD knowledge, awareness, and lifestyle practices are defined. Information about the rationale, objectives, and research questions is provided, as well as information about the structure of the thesis.

1.2 Context and potential implications of the study outcomes

Coronary heart disease is the leading cause of death in the world. It has economic and quality of life consequences (Bloom et al., 2011) and CHD is therefore a major medical and public health issue (A. K. M. Islam & Majumder, 2013). Coronary heart disease has no geographic or socioeconomic boundaries, with people in both developed and developing countries being affected (Deaton et al., 2011). However, there are disparities in incidence and prevalence between countries and socioeconomic levels (Carson et al., 2007; Oeffelen, Vaartjes, Stronks, Bots, & Agyemang, 2013; Wagner & Brath, 2012). These disparities need to be fully investigated and addressed. In high-income countries, people in the lower socioeconomic strata still have a higher proportion of CHD risk factors, a higher incidence of CHD, and higher mortality rates. These are similar to the global prevalence reported for low-income countries (BeLue et al., 2009; Falkstedt, Lundberg, & Hemmingsson, 2011; R. Gupta & Gupta, 2009; Kivimaki et al., 2007; Mackenbach, Cavelaars, Kunst, & Groenhof, 2000). The prevalence of CHD has increased in developing countries such as Bangladesh because of changes in lifestyle and lack of financial resources—resources that are usually used for disease prevention activities and medical access for the poor. A lack of medical and health specialists for
prevention and management of CHD also plays a role. Taken together, these variables mean that the larger disease burden will shift to lower socioeconomic groups (Deaton et al., 2011).

People’s knowledge and awareness about CHD are two important elements that might influence lifestyle behaviours and hence the impact of CHD. However, knowledge, awareness, and lifestyle practices may differ relative to people’s SES. The multiple variables that lead to this disparity, including ethnographic and pathophysiological, as well as socioeconomic, variables, remain to be determined in developing countries, with knowledge and awareness about chronic disease such as CHD requiring further research. Estimating the level of knowledge and awareness, and assessing lifestyle behaviours, among the general population may play an important role in public health to build up targeted health education programs that are vital within a low-income country such as Bangladesh.

The aims of the study were to estimate and compare knowledge, awareness, and lifestyle practices among and between high socioeconomic status (HSES) and low socioeconomic status (LSES) groups in Bangladesh, to determine the relationship between the levels of knowledge and awareness with respect to SES, and to explore the relationships of knowledge and awareness with lifestyle practices. As this is the first study to assess knowledge, awareness, and lifestyle practices related to CHD and how these are reflected in the HSES and LSES groups, the results of this study are very important for Bangladesh and South-East Asia. This study should generate information that could be used to influence government policy regarding CHD prevention and might help policy makers to prioritise and improve health education and interventions specific to SES groups by identifying sectors of the general population that should be targeted for health education programs. Importantly, this research might identify what aspects need to be emphasised and delivered differently for the two SES groups. For instance, as found in previous research, it might be found that smoking is more problematic in the lower socioeconomic sector than in the higher socioeconomic sector (Hanifi, Mahmood, & Bhuiya, 2011). Results concerning the level of knowledge about signs and symptoms of heart attack and CHD may help to reduce the number of deaths within LSES groups by providing appropriate direction and guidelines for primary and secondary preventive strategies that community health clinics and the government can pursue.
1.3 The burden of CHD

1.3.1 The global burden of CHD

In 2008, cardiovascular disease (CVD) was the leading cause of death worldwide and accounted for 17.3 million deaths. This represented 30% of all global deaths. CHD alone was responsible for 7.3 million of these deaths (World Health Organization [WHO], 2011a). Figure 1.1 illustrates worldwide causes of death.

If CHD cannot be prevented and controlled, it is estimated that by the year 2020 CHD will be responsible for a total of 11.1 million deaths globally (Backer, 2009). Three-fourths of global deaths and 82% of the total DALYs (disability-adjusted life years) due to CHD are currently found in the low- and middle-income countries (Gaziano, Bitton, Anand, Abrahams, & Murphy, 2010). For a developed country like Australia, the Australian Bureau of Statistics (ABS) 2007–08 National Health Survey (Australian Institute of Health and Welfare, 2012) reported that within the population of 22 million, 684,783 people had CHD and the number of hospitalisations due to CHD was 161,417 from 2007 to 2008, while CHD was responsible for 22,729 deaths in 2007. In comparison, according to Roger et al. (2012), CHD was responsible for the deaths of 405,309 Americans in 2008, and 785,000 Americans are expected to have a new heart attack every year and 470,000 a recurrent attack. However, in developed countries the overall increase in CHD burden and the age-adjusted death rates caused by CHD are...
decreasing (Gaziano et al., 2010). In contrast, in Syria one of the low-middle income countries of the Eastern Mediterranean Region, the CHD mortality rate increased by 64% (from 129 to 212 per 100,000 people per annum) between 1996 and 2006 (Rastam et al., 2012).

From an economic perspective, the annual possible CHD-related productivity loss in Australia was AU$1.79 billion in 2004 (Henry, 2010). In 2009, CHD cost the UK healthcare system around €2 billion (British Heart Foundation Statistics, 2009). In the USA, 1–3% of gross domestic product is accountable to CVD and almost half of that is related to CHD. In South Africa, 2–3% of the country’s gross national income was dedicated to the direct treatment of CVD, with indirect costs almost more than double the direct costs (Gaziano et al., 2010).

1.3.2 The burden of CHD in the South-East Asia Region including Bangladesh

In the South-East Asia Region (SEAR) it has been estimated that in 2008, non-communicable diseases (NCDs) were responsible for 14.5 million (55%) of all deaths, with 7.9 million deaths (25%) associated with CVD (WHO, 2011c). Refer to Figure 1.2.

![Figure 1.2.](image)

*Figure 1.2. Causes of death in the SEAR. Adapted from “Health and development challenges of noncommunicable diseases in the South-East Asia Region. Report of the Regional Meeting, (Report no.SEA/NCD/83),” by World Health Organization, 2011. Jakarta, Indonesia.*
Table 1.1 shows the CHD prevalence for different age groups in four countries. Coronary heart disease was prevalent in approximately 2–3% of the adult population, with a prevalence of 3.5% in India and 2.5% in Bangladesh. Data from India indicate that the prevalence in urban areas was estimated to be almost double that of rural areas. However, for Bangladesh no such data were found describing the urban versus rural CHD scenario (Iyre, 2011).

Table 1.1

Prevalence of Coronary Heart Disease Reported From Countries in the SEAR

<table>
<thead>
<tr>
<th>Country</th>
<th>Method of data collection</th>
<th>Age group</th>
<th>Rural / urban / national</th>
<th>Year</th>
<th>Sample size</th>
<th>Prevalence per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>Survey by clinical assessment</td>
<td>30+</td>
<td>Both rural and urban</td>
<td>2007</td>
<td>4,394</td>
<td>25</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>Survey of diagnosed patients</td>
<td>All ages</td>
<td>National</td>
<td>2004</td>
<td>23.3 million</td>
<td>17</td>
</tr>
<tr>
<td>India</td>
<td>Estimate based on meta-analysis</td>
<td>20+</td>
<td>Rural</td>
<td>2004</td>
<td>Not stated</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Urban</td>
<td></td>
<td></td>
<td>64</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td>34</td>
</tr>
<tr>
<td>Thailand</td>
<td>Survey of diagnosed patients</td>
<td>15–74</td>
<td>National</td>
<td>2007</td>
<td>130,301</td>
<td>15</td>
</tr>
</tbody>
</table>


Before describing the health context of Bangladesh including CHD, a brief description of the sociodemographic background of Bangladesh needs to be provided.

1.4 Socioeconomic status and background of Bangladesh

1.4.1 Socioeconomic status and CHD

The WHO has generated a social gradient to include social class differences, job stress, early life experiences, social exclusion, work, unemployment, social support, addiction, food, and transport as social determinants (R. Gupta, Kler, & Gupta, 2012). In addition
to these social determinants, the Australian Medical Association (2007) included education, earning, race, and disability. Fundamental socioeconomic parameters and societal influences, in addition to or in combination with awareness and knowledge of CHD, affect exposure and vulnerability to CHD risk factors. As a result, social determinants such as education, place of residence, employment, occupation, and income, or a combination of these determinants comprising SES should also be included when assessing the prevalence and impact of risk factors associated with CHD. Understanding the individual and social determinants of cardiovascular health behaviours is among the top 20 priority areas for NCD research in low- and middle-income countries (Australian Medical Association, 2007; Vaidya, Aryal, & Krettek, 2013).

1.4.2 Social and economic characteristics of the Bangladeshi population

Bangladesh is a member of the WHO SEAR undergoing social and economic change and is in the early stages of demographic transition. This is expected to continue in future. Bangladesh, with a population of 151 million occupying 147,570 square kilometres, is one of the most densely populated countries in the world, having a population density of 1,161 people per square kilometre (The World Bank, as cited in S. M. Ahmed et al., 2015). Around 90% of the total population of Bangladesh are Muslims, 9% are Hindus, and 1% are Christians, Buddhists, and members of other faiths (Directorate General of Health Services, as cited in S. M. Ahmed et al., 2015). The native language is Bangla; non-natives call it Bengali (Countries and their cultures forum, 2016). As part of the country’s demographic transition, the fertility rate declined rapidly from 6.9 births per woman in the early 1970s to 2.3 in 2010, and there was a population growth rate of only 1.37% between the 1991 and 2011 censuses (Bangladesh Bureau of Statistics & Ministry of Planning Statistics and Informatics Division, & The World Bank, as cited in S. M. Ahmed et al., 2015).

1.4.3 The economic climate

The economy is measured by gross domestic product (GDP), which has increased significantly at an annual rate of 6% between 1990 and 2010. Considering the gross national income (GNI), the economy has grown from US$100 per capita in 1973 to US$700 in 2010. In 2013, the GDP and GNI per capita were US$923 and US$838 respectively (WHO, 2014). At the national level in 2010, the average monthly income
per household at then-current values was estimated at Bangladeshi taka (BDT) 11,479; in urban areas it was BDT 16,475. This monthly household income had increased by 59.36% compared with 2005. Taking income distribution into account, the gap between the poorest of the poor (bottom 5%) and the wealthiest of the wealthy (top 5%) is extremely large. Nonetheless, the income increased slightly for the bottom 5% from 0.67% in 2005 to 0.76% in 2010 in urban areas, and for the top 5% it decreased slightly from 30.37% in 2005 to 29.39% in 2010 (Bangladesh Bureau of Statistics, 2011).

In spite of national economic growth, the unemployment rate in Bangladesh increased from 3.7% in 1991 to 4.3% in 2014, and this rate was higher among females as their unemployment rate more than doubled from 2.2% in 1996 to 5% in 2014. In contrast, among males there was a smaller increase in unemployment, from 2.7% in 1996 to 3.9% in 2014 (The World Bank, 2016a). In addition, poverty and income inequality still remain as challenges in Bangladesh. For example, 31.5% of the total population still live below the poverty line. Apart from some improvement in the human development index (HDI), the United Nations Development Program (UNDP) ranked Bangladesh as 146th of 187 countries with respect to HDI and placed it among low human development countries (S. M. Ahmed et al., 2015).

1.4.4 Urbanisation

Bangladesh is going through a rapid urban growth and urbanisation rate of 3.5% per annum (S. M. Ahmed et al., 2015), and the percentage of the population living in urban areas has increased from 5% in 1960 to 34% in 2015 (The World Bank, 2016b). Every year, around 300,000 to 400,000 mostly poor people migrate from rural areas to Dhaka city (The World Bank, 2007).

The number of people living in slums characterised by poverty, poor housing, overcrowding, and poor environmental conditions including those related to sanitation is growing in Bangladesh because of the rural to urban migration, leading to an increase in suboptimal housing and living conditions. From 1996 to 2005, the number of slum communities increased by 70% in Dhaka city and now 40% of the total population in Dhaka city live in slum areas (Angeles et al., 2009). People living within these slum areas comprise a lower economic stratum, which is largely a consequence of the type of employment they are able to secure such as trade jobs including rickshaw operators and general labourers (M. M. H. Khan & Kraemer, 2008).
1.4.5 Literacy and education

The adult literacy rate in Bangladesh has increased from 29.2% in 1981 to 57.7% in 2011. Secondary schooling for females since the 1990s has expanded extensively due to a reduction in gender disparity, especially in rural areas (General Economics Division [(GED] & Bangladesh Planning Commission, as cited in S. M. Ahmed et al., 2015). Adult female literacy has also increased noticeably from approximately 26% in 1991 to approximately 53% in 2011 (The World Bank, as cited in S. M. Ahmed et al., 2015). However, only 16.7% of girls and 23.5% of boys completed secondary school in 2005 (Bangladesh Bureau of Statistics, as cited in Sarkar, Reza, & Hossain, 2014). In rural areas there has been an increase in access by females to education, yet the discrepancy still exists for women completing their education. Conservative societal attitudes toward women have also restricted education and movement of women outside the home, and parents consider a girl’s education to be a waste of money because most parents believe in the stereotypical roles for girls as being focused on household activities (Sarkar et al., 2014).

The general educational structure in Bangladesh is divided into three levels: primary, secondary, and tertiary. Primary education consists of 5 years of formal schooling. Secondary education includes the first 3 years of junior secondary (classes VI–VIII), 2 years of secondary (classes IX–X), and the final 2 years of higher secondary (classes XI–XII). At the end of secondary schooling (classes IX–X), students take the public examination called the SSC (Secondary School Certificate). After completion of the higher secondary stage, students sit the HSC (Higher Secondary Certificate) exam. HSC holders are eligible to enrol either in 3-year degree pass courses or in 4-year bachelor degree honours courses at degree level colleges or at a university (Bangladesh Bureau of Educational Information and Statistics, 2006).

1.4.6 Coronary heart disease, SES, and knowledge and awareness about CHD

Studies conducted in Bangladesh and other developing countries in the world, including India and Brazil, have revealed that CHD and its primary risk factors are highly prevalent among slum people from the low socioeconomic strata (Podymow, Turnbull, Islam, & Ahmed, 2007; Riley, Ko, Unger, & Reis, 2007; Waingankar & Pandit, 2012). In India, slum people also have a lack of knowledge about CHD and its risk factors and are unaware of a wide range of effects that tobacco use has on health (Dhar, 2014;
INTRODUCTION

Waingankar & Pandit, 2012). However, in Bangladesh, knowledge and awareness about CHD and its risk factors have not been addressed with respect to SES. Socioeconomic class, however, does not clearly differentiate between people of high and low CHD risk. People within a high socioeconomic cluster are also at risk of CHD, as shown by a study in China where Ouyang et al. (2012) examined the seven modifiable risk factors of smoking, physical inactivity, unhealthy dietary habits, obesity, hypertension, dyslipidaemia, and hyperglycaemia among 2,648 office workers, and found an average of 2.8 risk factors present in the study group. More than 95% of the study group had at least one risk factor, 79.4% had at least two risk factors, and 55.6% had at least three risk factors. Similar to information about awareness and knowledge about CHD in Bangladesh, data regarding knowledge and awareness of CHD among the high socioeconomic group is also very limited in Bangladesh. In fact, no study has been conducted to evaluate knowledge and awareness about CHD in either the low or high socioeconomic strata of the population.

1.5 The context of Bangladesh and overall health issues including CHD

Like other low income countries in the world, due to epidemiological transitions, Bangladesh is experiencing a transition in which the burden of disease is shifting from infectious diseases, undernutrition, and problems associated with childbirth to NCDs including CHD (Bleich, Koehlmoos, Rashid, Peters, & Anderson, 2011). The country is still struggling with diseases such as diarrhoea and tuberculosis and other emerging and re-emerging communicable disease such as rabies, anthrax, Nipah, chikungunya, and antimicrobial resistance (Directorate General of Health Service, 2015) despite reducing the morbidity and mortality of communicable diseases such as malaria and kala azar from the year 2000 to 2014 (S. M. Ahmed et al., 2015). Nipah virus infection is not common in the Western world and was first recognised in a village in Malaysia between 1998 and 1999 and in Bangladesh in 2001. Encephalitis and respiratory distress are common clinical features of Nipah infection (Directorate General of Health Service, 2015). Deaths due to communicable, maternal, neonatal, and nutritional disorders reduced from 582.8 per 100,000 in 1990 to 177.9 per 100,000 in 2010 (S. M. Ahmed et al., 2015). Figure 1.3 indicates the percentage of mortality attributed to the main causes of death identified in Bangladesh in 2008 when NCDs accounted for 52% of total deaths whereas communicable diseases were responsible for 38%.
Considering the information presented in Table 1.1, Bangladesh has possibly the highest prevalence of CVD within the SEAR, but CVD is the least-investigated NCD category in Bangladesh. Comparing health promotion for CHD in Bangladesh with the global action against CHD, Bangladesh is a country left behind. Furthermore, data related to CHD in Bangladesh are not easily available, they are often insufficient, and they contain statistical errors (A. K. M. M. Islam & Majumder, 2013). In Bangladesh, 27% of all deaths were due to CVD in 2008, and by 2030 this was expected to rise to a possible 37% (WHO, 2011b). The 2014 prevalence figures were close to that estimate, with CVD accounting for 33% of deaths. Acute myocardial infarction was responsible for 8% of deaths at subdistrict, district, and medical college hospitals (Directorate General of Health Service, 2015). Coronary heart disease alone increased from 12% in 2006 to 17.11% of total deaths in 2012 in Bangladesh (WHO, 2006; World Health Rankings, 2012), with the prevalence being 2.5% (Iyer, 2011).

Despite the high prevalence of CHD and mortality rates in Bangladesh, results from a cost analysis in Bangladesh indicated in 2007 that the validated total cost of prevention strategies was US$3.95 per capita. This was 26% of total expenditure on health in Bangladesh and 79% of government expenditure. In contrast, for other SEAR countries that were investigated, expenditure was US$27.19, amounting to 66% of total
expenditure and 181% of government expenditure (Mirelman, Pérez Koehlmoos, & Niessen, 2012).

1.6 Coronary heart disease

Coronary heart disease is associated with a reduction of blood supply to the myocardium in association with atherosclerosis in the coronary arterial system (WHO, as cited in Walsh et al., 1975, p. 13). Atherosclerosis is the main cause of CHD. It develops by deposition of intracellular and extracellular fatty substances and cholesterol, complex carbohydrates, and blood and blood products such as calcium, intimal smooth muscle cells, and connective tissue, along with cellular waste products, in the internal lining of an artery (Gascoigne, 2006, p. 47; Walsh et al., 1975, p. 13). Heart attack occurs when the flow of oxygen-rich blood to a section of heart muscle suddenly becomes blocked due to atherosclerosis (National Institute of Health, 2015a). The most common symptoms of heart attack are central chest pain or discomfort; radiated arm pain; upper body discomfort including shoulder, neck, jaw, and back discomfort; shortness of breath; vomiting or nausea; a cold sweat; dizziness or light-headedness; and unusual tiredness (National Heart Foundation of Australia, 2011; National Institute of Health, 2015b). However, many people with CHD do not have any symptoms (Gerstenblith & Margolis, 2012, p. 4).

A large proportion of mortality and morbidity due to CHD is preventable through primordial, primary, secondary, and tertiary prevention (Daly-Nee, Brunt, & Jairath, 1999, p. 6; Gillman, 2015; Mathur, 2002). The focal point of these strategies is to prevent, reduce, or delay the multiple modifiable risk factors within the entire population (R. Gupta, Guptha, Joshi, & Xavier, 2011).

1.7 Coronary heart disease risk factors among the Bangladeshi population

A combination of nonmodifiable and modifiable risk factors is responsible for CHD (Bloom et al., 2011). Four nonmodifiable risk factors are age, gender, family history, and ethnicity. Four modifiable risk factors are mostly responsible for CHD: tobacco use, unhealthy diet, physical inactivity, and harmful use of alcohol. These modifiable risk factors are all behavioural risk factors and they lead to four metabolic changes: being overweight or obesity, raised blood pressure, elevated blood glucose, and elevated blood cholesterol (WHO, 2011b). Similar to other developing countries, due to the
demographic transition in Bangladesh, unhealthy lifestyles and health risk behaviours are becoming more common, which is leading to a greater prevalence of disease. The rising problems associated with an increase in the rate of CHD and other NCDs is therefore of great concern.

1.7.1 Nonmodifiable risk factors

1.7.1.1 Age and gender

Ageing leads to many physiological changes. One of these is a change in cholesterol level, and this is one of the main risk factors for CHD (Gerstenblith & Margolis, 2012, p. 8). In Bangladesh, people aged 60 years and over comprised 7% of the total population in 2012, and the percentage is increasing (United Nations, 2012). For example, the percentage of the population of 65 years and above is expected to increase from the 4.5% reported in 2000 to 6.6% in 2025. Compared with women, men are more at risk of CHD until the age of 45. Half of the male population is at risk of developing CHD by the age of 40 years, while among women the chance is one third up to the age of 55 years, and this is primarily due to female steroid hormone activity and a greater amount of high-density lipoprotein (HDL) (Blenkinsopp, Paxton, & Blenkinsopp, 2009, p. 328). According to the Sample Vital Registration System (as cited in WHO, 2014), the male:female ratio is 104.9:100.0.

1.7.1.2 Family history

A family history of CHD increases the risk of having CHD, especially if male family members were diagnosed with CHD before 55 years of age or female family members were diagnosed with CHD before 65 years of age (Gerstenblith & Margolis, 2012, p. 8). Data related to family history of CHD are not available for Bangladesh. However, a study conducted among the rural population in Bangladesh indicated that the percentage of family history of having CHD was 3.3%, of having hypertension (HTN) was 9.2%, and of having diabetes mellitus (DM) was 2.9% (Sayeed et al., 2010).

1.7.1.3 Race/ethnicity

Ethnicity is an important nonmodifiable risk factor among the Bangladeshi population. Several studies have indicated that, being South Asian, Bangladeshi people carry a higher risk of having CHD than do people from the US, the UK, and Canada, as well as
those with African American, Hispanic, Chinese, Japanese, or Filipino ancestry (M. Gupta, Singh, & Verma, 2006; Hajra et al., 2013; Khunti & Samani, 2004; Kuppuswamy & Gupta, 2005). The most reliable explanation for this higher risk of CHD among South Asians, including Bangladeshis, is a higher prevalence of metabolic syndrome including insulin resistance, hypertension, central obesity and hyperlipidaemia, and diabetes mellitus among that population group (Kuppuswamy & Gupta, 2005). The possible causes for this higher prevalence of metabolic syndrome might be excess body fat and adverse fat patterning, including abdominal adiposity, even when the BMI is within recommended limits.

Genetic variables may also play a role for this population (Misra & Vikram, 2004). Some risk alleles such as polymorphisms involving genes regulating expression of angiotensin-converting enzyme (ACE), apolipoprotein A (apoA), apolipoprotein B (apoB), apolipoprotein E (apoE), adipokine, homocysteine, plasminogen activator inhibitor-1, and fibrinogen are more common in the South Asian population (A. K. M. M. Islam & Majumder, 2013). Morshed et al. (as cited in A. K. M. M. Islam & Majumder, 2013) found a positive association between ACE insertion/deletion (I/D) polymorphism and hypertension in the Bangladeshi population. Short stature is also associated with CHD, and Bangladeshis are the shortest among the South Asian populations. This is associated with smaller diameter coronary vessels compared with Europeans, and it increases the risk of atherosclerosis and CHD (Bhopal et al., 1999; Paajanen, Oksala, Kuukasjarvi & Karhunen, 2009).

1.7.2 Modifiable risk factors

It is very difficult to find an adult without risk factors in Bangladesh, with most risk factors being lifestyle risk factors (Directorate General of Health Services & WHO, 2011). Table 1.2 shows the common modifiable risk factors among the Bangladeshi population aged greater than 25 years.
Table 1.2
Prevalence of Selected Risk Factors Among the Adult Bangladeshi Population

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Men (%)</th>
<th>Women (%)</th>
<th>Combined (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current smoking</td>
<td>54.8</td>
<td>1.3</td>
<td>26.2</td>
</tr>
<tr>
<td>Smokeless tobacco use</td>
<td>29.4</td>
<td>33.6</td>
<td>31.7</td>
</tr>
<tr>
<td>Tobacco use (any form)</td>
<td>70.0</td>
<td>34.3</td>
<td>51.0</td>
</tr>
<tr>
<td>Low vegetable / fruit intake (^a)</td>
<td>97.6</td>
<td>94.1</td>
<td>95.7</td>
</tr>
<tr>
<td>Low physical activity (^b)</td>
<td>10.5</td>
<td>41.3</td>
<td>27.0</td>
</tr>
<tr>
<td>Overweight (BMI &gt; 25 kg/m(^2))</td>
<td>13.0</td>
<td>21.6</td>
<td>17.6</td>
</tr>
<tr>
<td>Large waist circumference (^c)</td>
<td>8.0</td>
<td>33.7</td>
<td>21.7</td>
</tr>
<tr>
<td>Hypertension (^d)</td>
<td>18.5</td>
<td>17.3</td>
<td>17.9</td>
</tr>
<tr>
<td>Self-reported diabetes mellitus (documented)</td>
<td>4.3</td>
<td>3.6</td>
<td>3.9</td>
</tr>
</tbody>
</table>

\(^a\) < 5 servings/day.
\(^b\) < 600 metabolic equivalent (MET).
\(^c\) men ≥ 94 cm, women ≥ 80 cm.
\(^d\) ≥ 140/90 mm Hg or on antihypertensive medication.

Note. This table was adapted from “Strategic Plan for Surveillance and Prevention of Non-Communicable Diseases in Bangladesh 2011-2015,” by the Directorate General of Health Services & WHO, 2011, p. 16.

1.7.2.1 Tobacco smoking and chewing

According to the WHO (WHO, 2011b), tobacco use is the single most-preventable cause of death in the world. Globally, tobacco use is the leading behavioural risk factor, and it is responsible for 9% of global deaths (WHO, 2012). In Bangladesh specifically, tobacco is used either for smoking or as smokeless tobacco. The smoking products include cigarettes, bidis, dhumti, chuttas, chillums, hookahs, pipes, and cigars (WHO, 2011b). The risk of developing CHD depends on the age of commencement of smoking, how many years were spent smoking, and the number of cigarettes smoked (Shillingford, 1982, pp. 16–17). Importantly, the risk of CHD is also comparatively lower among ex-smokers than among current smokers, suggesting that discontinuing smoking has a beneficial health effect (WHO, 1982, p. 26). Smokeless tobaccos are used in several ways. These include chewing, sucking, or applying prepared tobacco on teeth and gums. The most common way to use smokeless tobacco in Bangladesh is tobacco with chopped areca wrapped by betel quid (S. Ahmed, Rahman, & Hull, 1997). Table 1.2 includes information about the tobacco usage status in Bangladesh. According
to the most recent data, available in 2009 from the Global Adult Tobacco Survey (GATS), 43.3% of adults in Bangladesh used tobacco in smoking and/or smokeless form. Males smoked tobacco more (44.7%) than did females (1.5%) with overall 23.0%, while females used smokeless tobacco more (27.9%) than did males (26.4%) with overall 27.2%, with the differences attributable to sociocultural traditions and perspectives (WHO, 2009). Some people use tobacco in both smoked and smokeless forms, which is known as dual form. Around 14.2% of adults use tobacco in dual forms in Bangladesh (WHO, 2014). Smoking is a little more common in rural areas than in urban areas in Bangladesh with the proportions being 22.5% and 19.9% respectively (Sultana, Akter, Rahman, & Alam, 2015).

1.7.2.2 Alcohol consumption

Alcohol consumption is also associated with a significant increase in the risk of CHD-associated mortality. However, alcohol consumption is not considered to be an isolated risk factor because it is strongly related to an unhealthy diet (Hastings-Asatourian, 2006, p. 75). Alcohol intake is also associated with elevated blood pressure if more than 21 units of alcohol per week are consumed, but the elevated blood pressure can be reversed if the intake of alcohol is decreased (Blenkinsopp, Paxton, & Blenkinsopp, 2009, p. 330). Alcohol is unlikely to be a strong risk factor in Bangladesh as the majority of Bangladeshis do not consume alcohol. The prevalence of alcohol consumption is in Bangladesh is 0.9% (WHO, 2014).

1.7.2.3 Unhealthy diet

Heart health is affected by an unhealthy diet in a number of ways. A diet high in saturated fat, low in fruits and vegetables, high in salt, and low in antioxidants is associated with CHD mortality (Hastings-Asatourian, 2006, p.71). According to the WHO (2012), the daily diet of Bangladeshis consists mostly of rice, some vegetables, and a small amount of pulses, as well as small quantities of fish if and when available. Milk, meat, oil, and fruit intake is low among the majority of Bangladeshis. Data about salt intake in Bangladesh is sparse. However, a study conducted by the National Heart Foundation Hospital and Research Institute of Bangladesh (as cited in WHO, 2012) reported a daily salt intake of 10–11 g/day in 200 healthy subjects from an urban sample. This was much higher than the WHO-recommended level of 5 g per day
(Rasheed et al., 2014). Data related to fruit and vegetable intake is included in Table 1.2.

1.7.2.4 **Physical inactivity**

Physical inactivity causes 6% of global deaths (WHO, 2012). Regular and moderate physical activity reduces the risk of CHD and mortality. Moderate levels of physical activity reduce the CHD risk by up to 30% (M. K. Ali, Narayan, & Tandon, 2010). Entries in Table 1.2 include the extent of low physical activity among the adult population in Bangladesh. The overall country-wide prevalence of low physical activity level found in the STEPS survey (STEPwise approach to Surveillance for NCD risk factors) in 2010 was 34.5% in Bangladesh. This is higher than the data presented in Table 1.2 in 2008 (Moniruzzaman et al., 2016).

1.7.2.5 **Hypertension**

Hypertension has a direct effect on the vasculature and development of the atherogenic process (Daly-Nee et al., 1999, p.11). The proportion of HTN is 17.9%, which is a little higher among males than among females in Bangladesh (Table 1.2). Two recently conducted studies indicated that the prevalence of HTN is higher in urban areas than in rural areas, with the percentages of 23.7% in urban areas and 13.6% in rural areas (S. M. S. Islam et al., 2015; Khanam et al., 2014). One of the leading physiological risk factors globally is elevated blood pressure, which accounted for 13% of global deaths (WHO, 2012). An upward trend in prevalence of HTN has been reported in Bangladesh. It was 7.8% in 1983, and increased to 17.9% in 2010 (Moniruzzaman, 2013).

1.7.2.6 **Diabetes mellitus**

Diabetes mellitus is regarded as an independent risk factor for heart disease. Although there are many complications associated with diabetes, including metabolic and microvascular complications, CVD is still the most common cause of death among diabetic patients at all ages (Abdel hafiz, 2012, p. 392). In Bangladesh, an upward trend in diabetes prevalence has been shown in a study conducted in a rural area (Rahim et al., 2007). In this study, the prevalence of type 2 diabetes increased from 2.3% to 6.8% between 1999 and 2004. Saquib, Saquib, Ahmed, Khanam, and Cullen (2012), using more sophisticated data, demonstrated that prevalence increased from 4% in 1995 to 2000, to 9% in 2006 to 2010. Table 1.2 contains entries relating to the self-reported
diabetes prevalence in Bangladesh in 2011. Raised blood glucose is a global risk factor, and it leads to approximately 6% of worldwide deaths (WHO, 2012).

1.7.2.7 High blood cholesterol

There is strong evidence of an association between high blood cholesterol and CHD risk (Daly-Nee et al., 1999, p. 7). A survey conducted in Bangladesh indicated that the prevalence of hypercholesterolemia in urban areas is 1.5% and in rural areas it is 1.2%, which was not as high as other modifiable risk factors (Zaman, Choudhury, Ahmed, Talukder, & Rahman, 2016).

1.7.2.8 Overweight/obesity

Body mass index (BMI) is a simple index of weight-for-height ratio that is commonly used to classify overweight and obesity in adults (Barba et al., 2004). A BMI above 23 kg/m² is an important risk factor for multiple disease conditions, which include CHD, HTN, diabetes, and dyslipidaemia. Body fat distribution is also considered to be an important risk factor for obesity-related diseases. Central obesity, determined by measuring waist circumference (WC) or excess abdominal fat, is also associated with an increased cardiometabolic risk (Klein et al., 2007). The prevalence of higher BMI and greater WC is higher among the female population in Bangladesh (Table 1.2). Being overweight or obese is another leading modifiable risk factor and is responsible for 5% of worldwide deaths (WHO, 2012).

The INTERHEART study (Joshi et al., 2007; Yusuf et al., 2004), conducted from 1999 to 2004, is a global case-control study of risk factors for acute myocardial infarction within 52 countries in Asia, Europe, the Middle East, Africa, Australia, North America, and South America. It indicated that Bangladesh had the highest prevalence of CHD risk factors in a control population who had no previous history of heart disease or history of exceptional chest pain. As a result, strong prevention strategies are required to reduce the risk among the entire population of Bangladesh.

1.8 Cardiovascular disease prevention activities in Bangladesh

In low-resource countries such as Bangladesh, prevention against emerging NCDs has only recently commenced as global health support efforts are still mostly concentrated on communicable diseases and building capacity for intervention strategies and
surveillance for NCDs is new (Mirelman et al., 2012). In Table 1.3 the ongoing projects for CVD prevention in Bangladesh are presented.

Table 1.3
Cardiovascular Disease Prevention Activities Currently Operating in Bangladesh

<table>
<thead>
<tr>
<th>Program / institution</th>
<th>Sector</th>
<th>Objectives</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Heart Foundation (NHF) since 1978</td>
<td>NGO</td>
<td>To provide cardiovascular care and promote cardiovascular health in Bangladesh</td>
<td>Heart “camps” throughout rural parts of the country to treat and educate cardiac patients; publish booklets and educational materials to build awareness of CVD prevention</td>
</tr>
<tr>
<td>National Institute of Cardiovascular Disease (NICVD) since 1978</td>
<td>Government</td>
<td>To provide emergency cardiac care, and promote prevention and treatment of CVDs in Bangladesh</td>
<td>Training of nurses and paramedics about CVD; conducting seminars and workshops to prevent NCDs; emergency cardiac care; services to prevent and treat chronic CVDs</td>
</tr>
<tr>
<td>NCD Control and Public Health Intervention Program of the Directorate General for Health Services since 2007</td>
<td>Government</td>
<td>To spread awareness of NCDs and NCD care</td>
<td>Develop awareness about NCDs among senior citizens, provide equipment for improving the quality of NCD care</td>
</tr>
</tbody>
</table>


In addition to the projects for CVD prevention listed in Table 1.3, some projects are being conducted for reducing CHD risk factors such as diabetes, HTN, and use of tobacco. Three projects for diabetes have been in progress at a nongovernment level since 2006, and there has been a child sponsorship program since 2003 that was extended in 2007 for type 1 diabetes. The Upazilla (subdistrict) NCD Project is coordinated by the government and addresses diabetes and HTN. In Bangladesh, districts are divided into subdistricts called upazilla. At a nongovernment level, the Bangladesh Institute of Research and Rehabilitation for Diabetes (BIRDEM), which is part of the Diabetic Association of Bangladesh (DAB), has been addressing diabetes
and metabolic disorders since 1956. Two projects have been active in controlling tobacco use, one since 1999, and the other since 2005. The Bangladesh Anti-Tobacco Alliance has been coordinated since 1999 by a nongovernment organisation, and the Smoking and Tobacco Product Usage Act, 2005 was passed by the Bangladeshi Government (Bleich et al., 2011).

The Bangladeshi government has developed a strategic plan for surveillance and prevention of NCDs for the period between 2011 and 2015 with the technical assistance of the WHO. In that plan, the Ministry of Health and Family Welfare (MHFW) is responsible for political lobbying and advocacy in order to create living conditions favourable to health and the achievement of healthy lifestyles and, building capacity in human and financial resources, infrastructure, and consumables (drugs, technologies). The ministry is also responsible for setting up an inter-sectoral committee for collaboration between the health sectors, education, finance, environment, transport, labour, agriculture, trade unions, and nongovernment organisations (Directorate General of Health Services & WHO, 2011).

1.9 Knowledge, awareness, and lifestyle practices related to CHD

According to the Oxford dictionary, the term knowledge refers to information and skills gained through experience or education (Soanes, 2002) and the Cambridge dictionary (2016) defines knowledge as “understanding of or information about a subject that you get by experience or study, either known by one person or by people”. Therefore, if people have the information that chest pain is the most common symptom of CHD or heart attack, they have knowledge of the most common symptom of CHD or heart attack. Knowledge about CHD and its risk factors is an important prerequisite for adoption of healthy lifestyle behaviours at an individual and community level (Jafary et al., 2005). Knowledge of the epidemiology, general pathophysiology, risk factors, symptoms of disease, prevention, and treatment associated with CHD is the basis for being knowledgeable about CHD (Fallows & Murfin, 2011).

The word awareness is defined as perception of a situation or fact or concern about, and well-informed interest in, a particular situation or development (Oxford Dictionaries, 2013). The psychology dictionary refers to awareness as a consciousness of internal or external events or experiences. In addition to having information about
and an understanding of CHD (i.e., knowledge), awareness of CHD is necessary at both individual and community levels. Awareness of CHD is an important part of preventive healthcare that can positively affect people’s lifestyles and reduce healthcare costs (Ladki, Mikdashi, & Dah, 1998). In this study, awareness about CHD is regarded as including awareness of people’s own CHD risk factors; possible preventive action against CHD; awareness of preclinical medical conditions related to CHD such as diabetes, HTN, and high cholesterol; one's own prediagnosed CHD; and awareness about appropriate action to take in the event of a heart attack. Awareness of CHD is characterised by positive behaviour patterns in which physical, mental, psychological, and social aspects are considered by individuals for maintaining good health and thus avoiding CHD.

There is a very specific difference between knowledge and awareness. Knowledge can be conveyed from one person to another. However, awareness cannot be. For example, if someone tells another that there are 13 risk factors of CHD, the first person is sharing knowledge about CHD risk factors with the second person. In contrast, if the first person tells the second person that he or she has some CHD risk factors, that does not mean the second person necessarily knows or is aware of their own risk factors. Many people may know about CHD and that there are risk factors associated with CHD, but they may not necessarily be aware about their personal risk factors for CHD. Therefore they may think they do not have any risk factors when in fact they do.

According to the WHO (1998), healthy lifestyle practice is defined as the mode of living that reduces the risk of being seriously ill or dying prematurely. A good lifestyle, which reduces risk behaviour associated with CHD and other chronic illnesses, helps individuals to enjoy more aspects of their lives and has a positive impact on their families and communities. A good, healthy lifestyle presupposes knowledge about and an awareness of chronic disease such as CHD.

1.10  Rationale for this study

The rising problem associated with an increase in the rate of CHD and other NCDs is of great concern. Preventive strategies have been identified by government and nongovernment agencies in Bangladesh, but they have had dubious outcomes. This necessitates a re-evaluation of what strategies might provide the best health outcomes
and how to put these in place to address CHD as a major health problem. This is because preventive strategies are an important prerequisite to reduce CHD. Preventive strategies, however, depend on how they are communicated and implemented, which in turn is based on the level of education, knowledge, and awareness of the population. In Bangladesh, there is a large divide between the high socioeconomic group, with much better education, and the low socioeconomic group—a divide that might also be reflected in different lifestyle choices. Therefore, strategies need to be specifically implemented that direct people of diverse backgrounds to be more concerned with the prevention of CHD by having adequate knowledge and awareness about heart disease that may lead to healthy lifestyle practices.

Coronary heart disease is associated with social and economic inequalities (Bhopal et al., 2002). Previously, CHD was regarded as a disease of affluence. However, as the level of affluence has increased in developing countries among the population, the low socioeconomic group has become more vulnerable to heart disease (Jeemon & Reddy, 2010). Knowledge, awareness, and lifestyle practices about CHD tend to be different among the high and low socioeconomic group of people because of four socioeconomic determinants: education, occupation, income, and place of residence.

On the basis of results from studies mentioned above about lifestyle practices, both LSES and HSES groups are at risk of CHD in Bangladesh. This is because, people from high socioeconomic groups tend to live a physically inactive lifestyle and to have food with a high level of fat. For instance, nowadays it can be seen in Bangladesh that people from the more affluent parts of society consume more junk food (Tabassum & Rahman, 2012). In April 2006, screening for CVD risk among bank employees of Gulbarga city in India, a country with a similar socioeconomic background to that of Bangladesh, revealed that of the 59 employees who participated, 83% were at risk in the initial screening (Vinod, Pastapur, & Suresh, 2012). On the other hand, however, tradespeople who live in slum areas and who in general lack resources and education are also at risk. Data from two surveys, conducted in 1994 and 2008 in Bangladesh, showed a decrease in smoking over a 15-year period from 40.9% to 26.7%, but smoking was still higher among the poor (31.9%) than among the better-off (17.5%) and thus those from the lower socioeconomic stratum retained a relatively high CHD risk (Hanifi et al., 2011). In Bangladesh, people with low incomes spend 10% of their regular income on tobacco, reducing the meagre income available for healthy food and healthy lifestyle choices.
(Coronary Artery Disease among Asian Indians [CADI] Research Foundation, 2012). Therefore, aiming for a cost-effective preventive strategy, the appropriate target population groups need to be found.

A study has also been conducted on the basis of SES and risk of CHD in a northern urban community of Bangladesh to determine the association of socioeconomic variables and blood lipid status of an urban population in Bangladesh (Khandakar, Ahsan, & Haque, 2010). It was found that the total cholesterol (TC) and low-density lipoprotein (LDL) level were significantly higher among wealthy people than among the poor. However, no study has been conducted comparing low and high socioeconomic groups of people in terms of their knowledge, awareness, and lifestyle practices in Bangladesh. In most of the studies conducted in Asia, awareness about CHD was evaluated by asking the participants about knowledge of CHD. However, as discussed above, there is an important difference between knowledge and awareness of CHD.

Reviewing the SES background and health status including CHD and its risk factors in Bangladesh, some questions arise. They include: What is the level of knowledge about CHD among Bangladeshis in the context of their SES? To what extent are Bangladeshi people aware about CHD considering their SES background? What is their lifestyle relevant to CHD in terms of their SES? Is there any association between CHD knowledge and awareness in terms of SES? Is there any association between people’s knowledge and awareness with their lifestyle practice in terms of SES? To find some answers to these questions, a cross-sectional study of people’s awareness and knowledge of CHD was conducted.

In this study, I evaluated knowledge, awareness, and lifestyle practices related to CHD among high and low socioeconomic groups of people. Knowledge, awareness, and lifestyle practices were determined following analysis of responses of the participants to the knowledge, awareness, and lifestyle practice questionnaire developed for this study.
1.11 Research questions

1. What is the level of knowledge, awareness, and lifestyle practices related to CHD among HSES and LSES people, and do these variables differ in terms of SES?

2. Is there any association between CHD knowledge and awareness of the participants with respect to their SES?

3. How are levels of knowledge and awareness about CHD reflected in lifestyle practices of the participants in terms of their SES?

1.12 Structure of the thesis

This thesis contains five chapters. This first chapter contains an overview of the thesis including the context of the study, rationale, and research questions.

Chapter 2 comprises a literature review in which previously reported research related to knowledge, awareness, lifestyle practices, and physiological variables related to CHD are reviewed, and how socioeconomic status may play a role with regard to knowledge, awareness, and lifestyle practices is considered. Finally, consideration is given to how knowledge, awareness, and lifestyle practices are associated with each other.

The third chapter contains a description of the methods used in this study. Study instruments, methods of sampling and data collection, and analyses, as well as ethical considerations, are described.

Chapter 4 presents the study findings about knowledge, awareness, and lifestyle practices, related to CHD, in particular how these variables differ between the two socioeconomic groups among the Bangladeshi population and the association of these variables to each other.

Chapter 5 highlights the findings obtained from this study and contains a discussion of the study’s findings with reference to the existing literature. It also contains considerations about the implications of the findings, the limitations of the study, and recommendations for future research.
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2 LITERATURE REVIEW

2.1 Introduction

This study is focused on knowledge, awareness, and lifestyle practices associated with coronary heart disease (CHD) among Bangladeshi people, relative to their socioeconomic status (SES). In this chapter, I provide a review of the literature that addresses the background to the variables that were investigated. This includes the role that SES plays in CHD and the importance of knowledge, awareness, and lifestyle practices in relation to CHD. I also describe the studies that deal with knowledge and awareness about CHD, and lifestyle practices, of different populations, and how these variables differ in the context of SES in different countries. In addition, the relationships between these variables are discussed, and the possible effect of knowledge and awareness on lifestyle practices is considered.

2.2 Socioeconomic status and CHD

Socioeconomic variables are considered to be independent risk factors (Franks, Tancredi, Winters, & Fiscella, 2010). An individual’s SES, characterised by education, financial security, employment status, and housing, affects health behaviour and health outcomes (Cooper, as cited in Liu, 2009). Compared with developing countries, affluent parts of the world have until now been more affected by heart disease, but changes in the demographics of the developing world have gradually changed the balance, with socioeconomically underprivileged groups reported to have an increased CHD prevalence. Socioeconomically underprivileged groups now have greater exposure to CHD risk factors of a socioeconomic origin (Kreatsoulas & Anand, 2010). Both childhood and adult socioeconomic variables are contributors to CHD risk and mortality, and the inequalities continue throughout the lifespan (Carson et al., 2007; Lemelin et al., 2009; Steptoe & Marmot, 2004). Although education, occupation, and income are strong predictors of health status, these are not the only predictors. Income and occupational health differences, which are seen in later life, are the consequences of interweaving chains of biological and social variables that are operational throughout a
person’s life (Lynch & Kaplan, 2000, p. 27). Figure 2.1 demonstrates how socioeconomic position affects health status at different stages of life. This figure is a modified version of a figure provided by Lynch and Kaplan (2000, p. 28) in that they did not include the knowledge and awareness box in their figure. The highlighted boxes are the focal areas of this research.

![Diagram](image)

**Figure 2.1.** Socioeconomic status influences on CHD from a life-course perspective. Modified from “Socioeconomic position,” by J. Lynch and G. Kaplan, in L. F. Berkman & I. Kawachi (Eds.), 2000, *Social epidemiology* (pp. 13–35). New York: Oxford University Press, p. 28.

There is an extensive consensus that what happens in the womb and during early life is very important because an early disadvantaged life may place a person at risk of future exposure to ill health (Lang, Lepage, Schieber, Lamy, & Kelly-Irving, 2012). Nutritional deficiencies; maternal smoking, alcohol, and drug use; and inadequate prenatal care that might be a consequence of the mother’s socioeconomic background
can lead to poor foetal development (Australian Medical Association, 2007). Barker et al. (as cited in Lang et al., 2012) reported an association between poor foetal nutrition and heart disease, hypertension (HTN), raised blood cholesterol level, noninsulin-dependent diabetes, and insulin resistance. Hardy et al. (as cited in Lang et al., 2012) also claimed that low birth weight and higher systolic blood pressure were associated with poor foetal nutrition.

Occupational status is an important determinant of the social and economic resources of a community (Wing, 1988). Occupational status provides a structural link between education and income in that educational experiences help to determine employment status and income level (Lynch & Kaplan, 2000, p. 23). Communities with a higher level of occupational status have, in general, lower stress levels, which contribute to a healthier life. This was illustrated in a study in Edinburgh and North Glasgow, which showed that being better educated, employed, and a nonmanual worker carried with it a lower risk of CHD for both sexes, with self-employed people having the lowest risk of CHD (Woodward, Shewry, Smith, & Tunstall-Pedoe, 1990).

According to Lynch and Kaplan (2000, p. 24), income is a valuable measure of socioeconomic position as it has a direct relationship with the material conditions that may influence health. Lynch and Kaplan found that even among retired people there is a higher risk of heart disease in comparison to the risk of full-time workers, due possibly to the loss of income and the low level of pension payments. In contrast, Hamner and Wilder (2010) did not find any association between annual household income and the full-time employed cohort in their study of heart disease risk.

It is obvious that the influence of SES on cardiovascular health is unclear. Some researchers have found no relationship between SES and CHD. For example, Lantz et al. (as cited in Pampel, Krueger, & Denney, 2010) disproved the notion that high mortality risks among deprived socioeconomic groups come primarily from the higher prevalence of risky behaviours in these groups. Lantz and colleagues corroborated these findings by demonstrating that the odds ratio for CHD mortality over a 7.5-year period fell by only 14% from the lowest to the highest education group while controlling for smoking, drinking, sedentary lifestyle, and relative body weight. Bhopal et al. (2002) stated that some studies showed coronary mortality and risk were not correlated with
socioeconomic inequalities, and lower socioeconomic background was considered to be insufficient to explain ethnic variation in CHD.

In contrast, other researchers have claimed that affluent people carry a greater risk of CHD. For example, the influence of socioeconomic variables on cardiovascular risk factors in the context of economic development was examined in the Samoan archipelago (Ezeamama, Viali, Tuitele, & McGarvey, 2006). In this study, the American Samoans who had more years of education, a higher material lifestyle, and more involvement in the wage economy had higher incidences of HTN, type2 diabetes, and obesity compared with the general Samoan population. A nationwide Japanese cohort study showed that men in lower SES groups had a marginal decrease in risk of CHD compared with women (Fujino et al., 2005). In addition, a study among married women in Bangladesh revealed significant positive relationships between BMI, the wealth index, and participants’ educational status (Hossain et al., 2012).

On the other hand, others have provided evidence that CHD is a disease of underprivileged people. The negative effects of neighbourhood deprivation on CHD in both men and women have been established in a Swedish study (Sundquist et al., 2006). In the USA, Michimi (2010) found that people within the same ethnic background group who had a low SES, characterised by low educational completion and low income, had a greater probability (53.24%) of being diagnosed with CHD than did people with a higher SES (14.48%). Similarly, in India, people with low SES, characterised by a low educational level including illiteracy, had a higher incidence of myocardial infarction and mortality (R. Gupta & Gupta, 2009; Pednekar, Gupta, & Gupta, 2011).

### 2.3 Knowledge about CHD

#### 2.3.1 The importance of knowledge about CHD

Prevention is the best way to combat CHD in a resource-poor country such as Bangladesh (M. S. Khan et al., 2006). For primary and secondary preventive approaches to impact on CHD prevalence, information about the extent of knowledge related to CHD and the associated risk factors in the general population is necessary, although it is not sufficient (M. S. Khan et al., 2006). Prevalence and CHD mortality will increase if the public does not have a clear and basic idea about what CHD is, its epidemiology,
how the disease develops, how specific risk factors contribute to the development of CHD, the signs and symptoms of CHD and heart attack, the preventability of CHD, and its treatment. Knowledge about these domains is important for all individuals. Moreover, individuals need to have relevant medical and dietary knowledge. Having this knowledge, people will be able to take the appropriate actions necessary to decrease CHD risk and be able to make appropriate health decisions (Bergman, Reeve, Moser, Scholl, & Klein, 2011; Ford & Jones, 1991).

It is important to have accurate knowledge about the epidemiology of CHD, such as CHD being the leading cause of death and the duration of the disease, to understand the seriousness of CHD and the extent to which people are being affected by the disease (Bergman et al., 2011). Knowledge about the association between CHD and health behaviour is an important prerequisite for helping people acquire information about the possible consequences of unhealthy activities and help them to modify unhealthy lifestyles to reduce the risk of CHD (Sanderson, Waller, Jarvis, Humphries, & Wardle, 2009). In addition to an understanding of CHD risk factors, a better understanding about the pathophysiology of CHD has led to remarkable advances in both prevention and treatment of CHD (Margellos-Anast, Estarziau, & Kaufman, 2006). Knowledge about early heart attack symptoms is essential to receive timely treatment to reduce morbidity and mortality (Awad & Al-Nafisi, 2014; Giardina et al., 2012). In addition, knowledge about CHD treatment options helps people, especially those from low SES backgrounds, to understand where medical care might be available so that appropriate medical care is accessed and thus mortality and morbidity associated with CHD is reduced.

Understanding the level of knowledge about CHD within the population by government agencies helps in guiding policy making and controlling CHD within the community (Dodani et al., 2004) and in providing a standard level of healthcare service to the community (Iyalomhe & Iyalomhe, 2010). The progress and execution of health promotion programs can be successful for improving knowledge if the scope and depth of knowledge of the target group can be recognised (Winham & Jones, 2011). Sometimes heart disease control programs fail to achieve the desired goals because of a lack of knowledge by patients about CHD (Iyalomhe & Iyalomhe, 2010). Evaluating the level of knowledge among the general population and patients with CHD for both primary and secondary prevention can provide a guideline for focusing public health
programs, especially those that emphasise reduction of modifiable risk factors for CHD (M. S. Khan et al., 2006).

2.3.2 Knowledge about CHD in different populations

Several groups of researchers have assessed knowledge about CHD. In most of the studies, evaluations were made of general knowledge about CHD risk factors, but CHD symptoms, CHD epidemiology, CHD preventability, and the definition of CHD have also been studied (Bergman et al., 2011; Homko et al., 2008; Kandula et al., 2010, M. S. Khan, et al., 2006; Lucas, Murray, & Kinra, 2013; Margellos-Anast et al., 2006; Muhamad, Yahya, & Yusoff, 2012; Mukattash et al., 2012; Swanoski, Lutfiyya, Amaro, Akers, & Huot, 2012; Vaidya, Aryal, & Krettek, 2013; Winham & Jones, 2011). A number of studies indicated that there are different estimates of the level of knowledge about CHD in different populations. Homko et al. (2008) evaluated the level of knowledge among inner city and rural underserved patients in Pennsylvania and found the mean ± SD knowledge score was 63.7% ± 14.7%, which was considered to be low for all participants especially for the men. Another study, among deaf patients, was administered by Margellos-Anast et al. (2006) between November 2002 and March 2003 in Chicago. These researchers evaluated knowledge by asking participants to list as many symptoms of heart attack as they could and to identify the correct risk factors for heart attack from a list. The researchers found that 40% of the participants could not volunteer any the heart attack symptoms, but 84.2% identified at least one risk factor for heart disease from the list provided. It was concluded that knowledge about CVD among deaf people was not only low but considerably lower than in the general hearing population.

Compared with the general population of developed countries, knowledge about CHD and its association with lifestyle behaviours is low among South Asians, as reported in several studies (see Lucas et al., 2013). In Pakistan, M. S Khan et al. (2007) conducted a study among patients with myocardial infarction (MI) to evaluate their knowledge about symptoms of MI. Sixty six percent of the participants failed to recognise the symptoms of MI. In conjunction with that, more than one third of them presented late to a hospital because of a lack of knowledge and low severity of chest pain, indicating a poor level of knowledge of CHD symptoms. In a study by Kandula et al. (2010) among South Asians living in the United States that included Indians and
Pakistanis, 89% of the participants knew little or nothing about CHD, again demonstrating a substantial lack of knowledge about CHD. In this study, knowledge about CHD was determined by asking two open-ended questions about major causes of heart attack and risk factors that are important for preventing heart attack. Although many (44%) of the participants mentioned stress, this was followed by HTN (11%), high blood cholesterol (10%), and diabetes (5%) as risk factors for CHD. Half of the respondents did not know that heart attacks are preventable. Kandula and colleagues suggested that a low level of education, particularly for the Urdu or Hindi language groups, was associated with poorer knowledge because most of US South Asians were immigrants and one third had limited English proficiency. The CHD prevention message probably did not reach them.

Studies in which open-ended questions were used indicated a lower level of knowledge about CHD-specific domains among the participants. For example, Jafry et al. (2005) reported that only 14% of patients attending a tertiary level hospital in Pakistan were able, in response to open-ended questions, to state that CHD is a condition involving limitation of blood flow to the heart, and 43.4% were able to identify stress as a CHD risk followed by dietary fat (39.1%), smoking (31.9%), and lack of exercise (17.4%). On the other hand, in a Malaysian study conducted among women, the knowledge level was estimated by asking women structured questions about CHD symptoms and its risk factors. Most of the respondents knew the typical symptoms of CHD, namely shortness of breath (86.6%), chest pain (85.9%), and palpitation (81%). However, only a small number of women (around 36%) volunteered atypical symptoms including jaw, left shoulder, and neck pain; nausea; or vomiting (Muhamad et al., 2012).

2.3.3 Knowledge about CHD in the Bangladeshi population

No publications were found in which knowledge about CHD among the general population in Bangladesh had been investigated. However, a focus group study was conducted in the USA to identify knowledge about HTN as a physiological risk factor for CHD, and health behaviour, among US South Asians. In that study, Bangladeshi participants mentioned that lifestyle variables that lead to HTN include too much unhealthy food, lack of sleep, and smoking, and they stated that they should modify
traditional recipes and use less oil in curries and less fat and sugar in sweets to prevent HTN (Changrani et al., 2011).

2.4 Awareness about CHD

2.4.1 The importance of awareness about CHD

Identification and reduction of risk factors such as HTN and obesity are important for preventing CHD and can be identified by implementing screening strategies that lead to early intervention (Carey-Hazell et al., 2005). Awareness of CHD among the general population is a fundamental element in the success of early intervention programs (Al-Baghli et al., 2010) and encouraging individuals to modify their behaviour (Crouch, 2008). Knowledge about CHD risk factors is not sufficient; using knowledge about CHD risk factors as well as being aware of the presence of one’s own risk factors is essential to modify lifestyle behaviour. Improved awareness about CHD has also been shown to lead to better results in a patient’s treatment and education program. For example, awareness of taking preventive action for CHD is vital for secondary prevention in a patient with CHD as well as primary prevention among a healthy population. Awareness of having medical conditions related to CHD, such as HTN, plays a significant role in controlling an individual’s health status. A study conducted in Bangladesh demonstrated that awareness of HTN resulted in actions that led to a reduction of blood pressure in a Bangladeshi hypertensive population (D. S. Alam, Chowdhury, Siddiquee, Ahmed, & Niessen, 2014). Likewise, awareness of one’s own CHD is important for early intervention programs (Al-Baghli et al., 2010).

As has been found with regard to knowledge about CHD risk factors, knowledge about heart attack symptoms is insufficient; awareness about taking action in the event of heart attack is also likely to be crucial (Mosca, Hammond, Mochari-Greenberger, Towfighi, & Albert, 2013). As a result, an adequate level of awareness among the general population has been regarded to be an important component for behavioural change to reduce this health problem (Nyaruhucha et al., 2003). The research findings are not consistent, however. Although Mukattash et al. (2012) found that greater awareness of disease was associated with better patient outcomes by encouraging prompt presentation for medical care, Mosca et al. (2006) found that better awareness directed toward greater personalisation of risk, or better lifestyle or development of protective behaviour, did not reduce the risk of CHD.
2.4.2 Awareness about CHD in different populations

A number of researchers have investigated the level of awareness of CHD by evaluating the knowledge level of CHD risk factors and the preventability of CHD (Aziz, Faruqui, Patel, & Jaffery, 2009; Fernandez, Salamonson, Griffiths, Juergens, & Davidson, 2008; Schweigman, Eichner, Welty, & Zhang, 2006). For example, Fernandez et al. (2008) assessed awareness by assessing knowledge about CHD risk factors among patients who underwent percutaneous coronary intervention (PCI) in Australia. Similarly, Aziz et al. (2009) assessed awareness of CHD by investigating knowledge about CHD risk factors and their preventability in a Pakistani cohort. They perhaps have done this on the basis of there being no difference between knowledge and awareness.

However, knowledge and awareness are not same. Awareness is the ultimate driving force that stimulates knowledge (Madson, as cited in De Lavega, 2004). Research concerning awareness about CHD is very limited. Al-Baghli et al. (2010) evaluated CHD awareness by conducting a screening study in Eastern Saudi Arabia. The researchers evaluated awareness by asking participants whether they were aware of having heart disease, and they found that only 2.7% among 197,681 participants possessed that awareness. They also found that awareness about CHD was considerably higher among females than among males. This low level of awareness among the participants reflects the lack of effective and focused government policy, and implementation for prevention of CHD (Al-Baghli et al., 2010). Mosca et al. (2013) undertook a national survey about women’s awareness, preventive action, and barriers to cardiovascular health in the USA. They also assessed awareness by evaluating participants’ knowledge except for one question about awareness on taking action in the event of heart attack, where 65% women reported they would call the emergency number if they were experiencing signs of a heart attack and 85% of women replied they would call the emergency number if someone else exhibited signs of heart attack. The results obtained by Al-Baghli et al. (2010) and Mosca et al. (2013) are more informative about the general level of awareness in different communities as their questions were appropriate for identifying awareness about CHD in contrast to Aziz et al. (2008) and Fernandez et al. (2008) who investigated the level of knowledge.

Studies about other health conditions such as HTN, diabetes, obesity, and high blood cholesterol among different population groups assessed those conditions more
accurately as the researchers did not evaluate knowledge of those condition by means of
awareness (Cunningham-Myrie et al., 2013; Huang, Buring, Ridker, & Glynn, 2007;
Nyaruhucha et al., 2003; Sabouhi, Babaee, Naji, & Zabeh, 2010). In the US in 2009, the
median awareness level of HTN as one of the major risk factors for CHD was 82.4%
among men and 80.3% among women (Olives, Myerson, Mokdad, Murray, & Lim,
2013). To evaluate the awareness of cholesterol among women in the USA, Huang et al.
(2007) asked a question about their cholesterol level and found that 84% of women
were aware of their cholesterol level.

2.4.3 Awareness among the Bangladeshi population

No study was found about CHD awareness among the Bangladeshi population. However,
a study was conducted among the rural and urban subpopulations in India and
Bangladesh to evaluate awareness about HTN (Quasem et al., 2001). Awareness was
assessed by participants’ report of a previous diagnosis of HTN. The researchers found
that the overall awareness level of HTN among Indians was low at 51.6% and it was
lower (32%) in Bangladesh.

2.5 Lifestyle practices

2.5.1 The importance of lifestyle practices for CHD prevention

Coronary heart disease is primarily a lifestyle disease that is responsive to lifestyle
changes (Crouch & Wilson, 2011). Prevention of CHD is significantly related to
changing long-established lifestyle behaviours (Rossi & Rossi, 1999, p. 47). The
leading causes of death and disabilities are indisputably associated with personal health
and lifestyle practices, and might be avertable through regular screening and health
counselling (Sabra et al., 2007). For CHD prevention, a global strategy that is based on
an understanding by health professionals of the significance of known and recognised
CHD lifestyle risk factors in different geographic regions and ethnic groups is
necessary.

Lifestyle practices such as a healthy diet, not smoking, and physical activity reduce
the clinical risk factors and also reduce inflammation, oxidative stress, glucose
intolerance, and arrhythmias (Greenland et al., 2003; Nissen et al., 2005; Turnbell, et
al., 2003). Individual lifestyle behaviours reduce the CHD risk, but a combination of
healthy lifestyle choices has greater positive effects on health in comparison to applying
single lifestyle factors to prevent CHD. Sixty two percent of coronary events can be avoided among men if their lifestyle adheres to the five healthy lifestyle variables of absence of smoking, a moderate to vigorous level of physical activity comprising at least 30 minutes per day, moderate alcohol consumption, a BMI less than 25kg/m², and a healthy diet score based on the Alternate Healthy Eating Index (AHEI; Chiuve, McCullough, Sacks, & Rimm, 2006). A healthy diet, exercise, and abstinence from smoking were associated with very low risk of CHD in the US women (Stampfer, Hu, Manson, Rimm, & Willett, 2000). From childhood, people acquire different lifestyle behaviours in their daily lives, and inclusion of high CHD risk factor combinations increases the prospect of CHD. Maternal influence on embryonic or foetal development increases the risk of having heart disease in later life if the mother had an unhealthy lifestyle (Crouch, 2008), indicating the importance of good lifestyle practices, especially during pregnancy.

Paganini-Hill (2011) conducted a prospective cohort study with 13,296 adults, trialled for 26 years, to determine the impact of modifiable lifestyle practices on longevity and successful ageing. The researcher calculated the risk estimates among four age groups and found that current smoking was the most important variable. It increased the risk in all age groups for men and women equally. In women who were < 80 years old and who had an alcohol consumption of \( \leq 3 \) drinks/day, and in men who had \( \geq 4 \) drinks/day, there was a reduction of 15–30% in their CHD risk. Participants who were active and 70+ years old had a 20–40% lower risk. In addition to primary prevention, healthy lifestyle behaviours are important for successful management of chronic illness such as CHD because it is a part of an intensive, complex, and coordinated therapeutic intervention to minimise relative complications of CHD (Senesael, Borgermans, Van De Vijver, & Devroey, 2013). For effective self-management after an acute coronary event, and to prevent relapse, knowledge of strategies for risk factor modification is not sufficient. Commitment and skills to modify behaviour are also needed (Fernandez, 2007). Healthy lifestyle practices are important not only for those who do not have CHD but also for those who already have the disease. Importantly, patients who discontinued the recommended lifestyle modification did not improve their health status (S. J. L. White, 2008).
2.5.2 Lifestyle practices related to CHD within different populations

Lifestyle behaviours may be dissimilar in different study populations. A conceptual framework was developed for the INTERHEART study to describe how variation by region and ethnicity affects behavioural practices (tobacco use, physical activity, diet, and vegetarianism) as well as psychological stress and how they in turn affect the development of heart disease (Ounpuu, Negassa, & Yusuf, 2001). That framework, in modified form, is shown in Figure 2.2.

![Conceptual framework](image)

**Figure 2.2.** Conceptual framework to describe how variation by region and ethnicity affects behavioural practices. Modified from “INTER-HEART: A global study of risk factors for acute myocardial infarction,” by S. Ounpuu, Negassa, and Yusuf, 2001, *American Heart Journal, 141*, 711–721.
A review study in Australia demonstrated the prevalence of health risk behaviours such as smoking, alcohol consumption, physical inactivity, and dietary habits among patients with CHD in the community and reported that the prevalence of smokers who smoked daily was 20–21.3%. In addition, prevalence of harmful use of alcohol was 10–14%, 34–54% people were insufficiently active, and low amounts of fruit and vegetables were being consumed by 46–48% and 70–86% respectively (Huang, Daddo, & Clune, 2009). In their study among California adults, Bellow, Epstein, and Parikh-Patel (2011) reported that 5% of the respondents were diagnosed with CHD and that 75% of them were not eating adequate amounts of fruit and vegetables, 55% were not involved in regular physical exercise, and almost 15% were smokers, and thus the prevalence of lifestyle practices was close to the Australian study conducted by Huang and colleagues. In a separate study in the United States, prevalence of active smokers among the adult groups was 21% (for men it was 23% and for women 18%), and only 33% engaged in the recommended level of physical activity, which is much lower than among CHD patients in California (Stuart-Shor, Berra, Kamau, & Kumanyika, 2012). Byrne, Walsh, and Murphy (2005) reported that 16% of patients in west Ireland were occasional or regular smokers and 30% were ex-smokers, 53% had a low-fat diet, and 22% a high-fat diet. Overall, 9% of the patients consumed alcohol more than at the recommended level. However, a low response rate for alcohol consumption was assumed because of the sensitive nature of this behaviour.

A study among Turkish heart disease patients also described lifestyle practices as poor among the study participants (Erenay & Oguz, 2011). Among them, 65.5% were physically inactive, 47.3% were current smokers, and 19.1% were alcohol users. Although alcohol use is a more sensitive issue in a predominantly Muslim country such as Turkey compared with Ireland, the prevalence of alcohol consumption was much higher than in Ireland. Sabra et al. (2007) conducted a study of male students at the King Faisal University in Saudi Arabia. In this study, participants were interviewed using a validated questionnaire and it was found that 37.7% and 46.5% were spending time watching TV and using a computer more than 14 hours per week, respectively. In the same study, 71.1% of the participants were involved in physical exercise, which is quite high given the amount of time spent watching TV. In addition, approximately 19% of the participants were smokers, 64.4% were consuming junk food one to five times per week, and 20.1% were consuming junk food six to ten times per week. In a separate study among women in Malaysia, Muhamad et al. (2012) found only 13.3%
were involved in adequate physical activity, and 15.1% did not consume fatty food more than three times per week.

2.5.3 Lifestyle practices related to CHD within the Bangladeshi population

Very little information related to lifestyle practices is available for the Bangladeshi population. However, it has been found that most Bangladeshi people do not maintain healthy lifestyle practices until they experience a lifestyle-related disease such as CHD (Lucas, Murray, & Kinra, 2013). Among South Asian people, risk of CHD is highest among the Bangladeshis, followed by Pakistanis and Indians. This is because Bangladeshis have a higher prevalence of smoking, they consume less fruit and vegetables, and they are involved in less physical activity (Bhopal et al., 1999). The INTERHEART study (Joshi et al., 2007; Yusuf et al., 2004), conducted from 1999 to 2004, is a global case control study of risk factors for acute MI among 52 countries and reported that among Bangladeshis the prevalence of current and previous smoking was 59.9% and for daily intake of fruit and vegetables 8.6%. Two WHO STEPS surveys were conducted in Bangladesh, one in 2002 (Ranasinghe, Ranasinghe, Jayawardena, & Misra, 2013) with a sample size of 11,409, and the other in 2009 with a sample size of 9,275. In 2002, the overall physical activity level was 52.3% and in 2009 it was 27%. Women were more inactive than were men, with percentages relating to inactivity being 41.3% and 10.5% respectively. When lifestyle practices for Bangladeshis were evaluated outside of Bangladesh, a similar picture emerged. Physical activity among Bangladeshi immigrant women in New York was 35.1%, which is higher than that reported in Bangladesh but still lower in comparison with other ethnic groups in New York. Among the Bangladeshi immigrant women, 17.4% chewed betel quid (also called “paan” in Bengali), and over half of them used tobacco in their betel (Patel, Rajpathak, & Karasz, 2012).

Dietary intake differs on the basis of race as well as community and lifestyle factors (R. B. Singh & Niaz, 1993). According to Iyer (2011), 93% of the Bangladeshi population were eating fewer than five servings of fruit and vegetables per week. Because of the demographic transition occurring in the country, dietary habits of the general population have changed. The healthy traditional high-fibre, low-fat, low-calorie diet containing whole grains and fruit and vegetables has been substituted with
foods containing high saturated fats, trans fats, and high sugar or salt, which all increase the incidence of obesity and diabetes and increase the risk of CHD (WHO, 2011b).

Because of sociocultural norms in Bangladesh, tobacco smoking among females is not well accepted. This is reflected in the prevalence of smoking in a recent study in Bangladesh (Sultana et al., 2015). The study revealed that only 1.4% of females, in contrast to 48.3% of males, were smokers. However, the higher prevalence of smoking among males leads to passive smoking among females, nonsmoker males, and children. Among Bangladeshi people, the percentage of daily smokers was 25.4% in 2010, and this was the highest in the South East Asian Region (Iyer, 2011). Prevalence of smokeless tobacco use (chewing or sniffing tobacco) was the highest among females in Bangladesh in the South-East Asian Region (SEAR) in 2006 to 2009 (WHO, 2011b). In addition, almost one third of the Bangladeshi population use tobacco in one form or another, with 20.5% smoking, 20.6% chewing, and 1.8% using gul (Flora, Mascie-Taylor, & Rahman, 2009). In Bangladesh, the consumption of alcohol is strictly prohibited from a religious point of view for Muslims, and in general alcohol consumption is low at approximately 0.8% of the population (Iyer, 2011).

2.6 Knowledge and awareness in the context of SES

Knowledge and awareness are associated with SES. People of low SES, especially when the SES determinant is educational attainment, not only have a higher prevalence of risk factors, but also have less awareness about CHD risk factors (Squires, 2000). Wardle and Steptoe (2003) claimed that people within a low socioeconomic group had strong beliefs about the influence of chance on health. Moreover, they had less health consciousness (thinking about things to do to keep healthy), they thought less about the future, and they had a lower life expectancy. In France, smokers who were manual workers and in a highly educated group, were less likely to agree that at least 50% of smokers would die of a smoking-related disease. This finding is contrary to other findings that having higher level of educational attainment may improve individuals’ awareness. This may be due to a lack of health-related information being included in their formal education curriculum or their social-occupational milieu. Smokers with low incomes had a lesser tendency to believe that lifetime smokers lose at least 10 years of life expectancy (Peretti-Watel, L'Haridon, & Seror, 2013). Homko et al. (2008) explored whether cardiovascular disease knowledge and risk awareness among
Medically underserved low SES people in Japan corresponded with a higher risk of cardiovascular disease. They reported that medically underserved people who are at high risk showed a limited level of CVD risk factor knowledge. Additionally, the study revealed that people with a higher annual income had greater levels of knowledge and awareness about cardiovascular risk factors. In an American study, people from a rural community who did not graduate from high school and were economically poorer had a lack of knowledge about heart attack symptomatology (Swanoski, Lutfiyya, Amaro, Akers, & Huot, 2012). In Korea, income and education were significantly negatively correlated with heart attack symptoms and knowledge about risk factors. Moreover, low perceptions of heart attack risk were associated with a lower level of cardiovascular risk factor awareness (Kim, Hwang, & Kim, 2011).

Education level is not the only contributing factor for knowledge and awareness of CHD. Additional variables such as gender, occupational status, ethnic group, country where the person lives, and SES are all interrelated. This is highlighted in a study from Nigeria. Coronary heart disease awareness and knowledge levels were poor among university senior and junior staff, but the level of knowledge was associated with educational attainment (Ansah, Oyo-Ita, & Essien, 2007). In a Pakistani study, despite having a higher proportion of literacy in the study sample compared with the general Pakistani population, a lower middle-class urban cohort exhibited a low level of knowledge about heart disease risk factors. Only 12% identified smoking, 9.9% physical inactivity, 36.8% fatty food, 2.2% excessive alcohol, 16% high blood pressure, 15.6% high cholesterol, and 19.2% being overweight as being risk factors for heart disease. This lack of knowledge may again be related to the level of education and that the academic curriculum does not contain sufficient health education messages (Dodani et al., 2004).

With regard to HTN, a comparison of urban and rural populations in India and Bangladesh by Quasem et al. (2001) demonstrated that the extent of awareness about HTN was not related to place of residence (urban vs rural), but a positive relationship was found between awareness of prediagnosed HTN and education. Quasem et al. suggested that this may be due to people with better education being more inclined to visit a doctor than a traditional healer in a country such as Bangladesh and, as a result, they are more likely to be aware of their condition. The studies cited here indicate that association between knowledge and awareness, and an individual’s socioeconomic
background, especially educational attainment, is still a matter of debate and this issue requires further investigation.

2.7 Lifestyle practices in the context of SES

Over the last several decades, many clinical trials have been conducted to modify individual lifestyle risk factors such as smoking, excessive alcohol consumption, poor diets, and physical inactivity, and usually the trials that included elements of social organisational change into their interventions were more successful (Berkman & Kawachi, 2000, p. 7). Social background variables such as educational attainment, SES, and living conditions can play a vital role in people’s adoption and maintenance of preventive health behaviours (Emmons, 2000, p. 242). It is now clear that most CHD risk behaviour is not randomly distributed in the population. Risk factors for CHD are moderately socially patterned and generally additive with one another. For example, people who drink excessive alcohol are often smokers as well. People with low SES have a lack of education, are often socially isolated, and tend to be more involved in unhealthy lifestyle practices (Berkman & Kawachi, 2000, p. 7). In addition, distal social structural forces evidently form a person’s routine experiences in ways that are not usually recognised by health promotion interventions. For example, in developed countries, middle-class neighbourhoods have more pharmacies, restaurants, banks, and specialty stores, whereas low socioeconomic areas have more fast food restaurants, cheque-cashing stores, liquor stores, and laundromats (Emmons, 2000, p. 248).

Several groups of researchers have investigated lifestyle practices in the context of different domains of SES including education and place of residence. Yarnell et al. (2005) found that in Northern Ireland and France, people with a shorter period of full-time education and without employment tended to consume more alcohol. Nordahl et al. (2013) found that women and men with less education were more likely to be current smokers, exhibit sedentary leisure time behaviour, have higher BMIs, and have a less favourable risk factor score when compared with those who had more extensive education. These findings confirmed previous claims that behavioural risk factors partially mediate the effect of education on CHD. The prevalence of using betel quid is increasing in rural areas of Bangladesh, with an estimated 33.2% of rural people using betel quid and 82.5% among those using tobacco in their betel (Heck et al., 2012). Comparatively, tobacco smoking is more common among people in the slum areas, with
a prevalence of 59.8% compared with people from non-slum areas (46.4%) of six city corporations in Bangladesh (M. M. H. Khan, Khan, Kraemer, & Mori, 2009). This percentage is much higher compared with the prevalence of tobacco use at 12.54%, alcohol use at 9.14%, and physical inactivity at 33.64% among people of urban slums in Patna, India (R. Singh, Mukherjee, Kumar, & Pal, 2012).

A study conducted in Pakistan showed that the main activity among the lower middle-class urban community was walking stairs and shopping trips. This was regarded, although insufficient, as being the maximum physical activity among the participants (Aziz et al., 2008). In 2004, physical inactivity in Sri Lanka was more common among urban people, with a prevalence of 35.2% compared with rural people’s prevalence of 27.6% (Ranasinghe et al., 2013). Unplanned urbanisation has led to an environment that is prohibitive and unsafe for physical activity. In a population-based study in Bangladesh, 44% of the urban and 25% of the rural respondents were physically inactive. In particular, 53% of urban and 21% of rural young age groups were physically inactive. Moreover, 35% of the urban and 29% of rural women led a physically inactive lifestyle (Khanam, Lindeboom, & Koehlmoos, 2011). Fast foods are becoming more accessible and well accepted among the Bangladeshi population, especially among the affluent segments of society. This has led to unhealthy diets and, as a consequence, prevalence of CHD is increasing (Saquib et al., 2012).

2.8 The association between knowledge and awareness

Knowledge about disease alone is not sufficient for good healthcare outcomes, but that it helps individuals to make better health decisions is well documented. Improved awareness about a disease may also lead to earlier presentation to medical care, which may lead to better health outcomes (Mukattash et al., 2012). However, the association between knowledge and awareness is still inconclusive, and very little research has been conducted to identify the association between knowledge and awareness. Some studies (Dewi, Stenlund, Marinawati, Ohman, & Weinehall, 2013; Gill & Chow, 2010; Sabouhi, Babaee, Naji, & Zabeh, 2011; Tanihara et al., 1999) have found a positive correlation between knowledge and awareness, but other studies (S. Ahmed et al., 1997; Crouch & Wilson, 2011; Gholizadeh Salamonson, Worrall-Carter, DiGiacomo, & Davidson, 2009) did not reveal any association. In order to explore the association between CHD knowledge and awareness, researchers have used different methods. Gill
& Chow (2010) examined knowledge about warning symptoms of heart attack and awareness about the proper action required during cardiovascular emergencies among both inpatients and outpatients in a Canadian inner-city hospital and found that patients with sufficient knowledge about warning signs of heart attack demonstrated a relatively adequate awareness about the proper actions required during cardiovascular emergencies.

Researchers have conducted a quasi-experimental study in Indonesia to identify the effectiveness of an intervention program among both high and low socioeconomic participants (Dewi et al., 2013). Knowledge and awareness were evaluated regarding CVD risk factors including smoking, physical inactivity, and fruit and vegetable consumption, and data were collected using the WHO STEPwise questionnaire. After pretesting, a community intervention program (PRORIVA: Program to Reduce Cardiovascular Disease Risk Factors in Yogyakarta, Indonesia) was provided to participants through community meetings, some group activities, and the mass-action interventions addressing smoking, physical inactivity, and low fruit and vegetable consumption, for 7 months. Following the intervention program a posttest was conducted and it was revealed that men improved their knowledge level from 56% to 70% and women from 60% to 75%. The study’s results indicated that with the improvement of knowledge, the awareness level of CVD was also improved (Dewi et al., 2013).

Crouch & Wilson (2011) reported that knowledge about CHD was good among rural Australian women, but the women were not aware of heart disease risk factors and they led unhealthy lifestyles. The majority of the women reported that they had been involved in physical exercise within the previous month, and half of them told the investigators that they checked their cholesterol level. However, they stated that they were consuming large amounts of alcohol in a single session. The investigators concluded that the women might know about heart disease risk factors, but nevertheless might be unaware of their susceptibility to heart disease in relation to the risk factors. In contrast, in a study of Bangladeshi patients in east London, S. Ahmed et al. (1996) concluded that the majority of their participants (80%) were well informed about the consequences of tobacco use but they were unaware about the health risks of that practice. To identify the relationship between knowledge and awareness, further research is necessary.
2.9 The effect of knowledge and awareness on lifestyle behaviour

Knowledge and awareness about a possible health risk is an essential first step in taking action to reduce the danger of disease, but may not be adequate (Mosca et al., 2006). Knowledge about CHD and risk-reduction strategies and awareness of CHD risk and risk factors are also essential to improve healthy behavioural practices among the general population. These things are also essential for people who already have the disease to avoid the reappearance and the progression of the disease (Daly-Nee, Brunt, & Jairath, 1999, p. 6; WHO, 1982). It is a matter of debate whether knowledge and awareness have any effect on lifestyle practices or not. Some researchers (Long, Taubenheim, Wayman, Temple, & Ruoff, 2008; Rana, Wahlin, Lundborg, & Kabir, 2009) have demonstrated that knowledge and awareness have an effect on lifestyle practices, whereas others (Lyle, 2011) did not find that knowledge and awareness have an effect on lifestyle practices.

Worldwide, health education programs are regarded as providing knowledge and therefore increasing the choices available to individuals for improving health. Knowledge about CVD that is provided through health education programs has a greater effect on modification of lifestyle practices and this has also been established in a study in rural Bangladesh (Rana et al., 2009). The Bangladeshi program included information about physical activity, advice about healthy food intake, and advice about other aspects of health management to the elderly, caregivers, household members, and the general community. The program ran for 15 months and comprised weekly counselling sessions. Following the program, the study group scored higher than did a control group on measures of overall health-related quality of life (HRQoL). HRQoL was the study instrument, which was validated and reliable. Yahya, Muhamad, and Yusoff (2012) found positive associations of knowledge, attitude, and practice on CVD including smoking, physical activity, and diet among women in Kelantan, Malaysia. Jafary et al. (2005) reported that patients attending tertiary care hospitals in Pakistan had a poor level of knowledge about the meaning of CHD as well as symptoms and risk factors of CHD that led to a lack of preventive practices. However, some researchers did not find any association between knowledge and lifestyle practices (Avis et al., 1990; Sabouhi et al., 2011). To clarify whether cardiovascular risk factor knowledge is sufficient to influence behaviour, Avis et al. (1990) examined cardiovascular risk factor knowledge by asking respondents what specific steps a person could take to reduce the
risk of a heart attack or stroke. Risk factors including physiological measures, socio-demographic variables, and self-perceptions of health were also measured, and the researchers reported that knowledge was not significantly associated with risk-reducing behaviour. In a separate study in Iran, Sabouhi et al. (2011) did not find any association between knowledge about HTN and lifestyle practices among the patients with HTN. Knowledge about HTN was evaluated by asking what the meaning of HTN is, and the meaning of the two values (normal systolic and diastolic blood pressure) that are usually reported. Health practice was evaluated by asking questions about regular checkups for HTN by a doctor, medication use, physical activity, and diet.

Awareness about CHD also has an effect on lifestyle practices. Long et al. (2008) conducted a study to explore the association between awareness and lifestyle practices in the USA. In this study, the National Heart, Lung, and Blood Institute commenced the first federally sponsored national campaign, The Heart Truth, to improve awareness about heart disease among women in 2002. After 5 years of the campaign, surveys demonstrated that awareness improved and was associated with more actions aimed at the reduction of heart disease risk. However, some researchers have claimed that knowledge alone is not sufficient. Both awareness and knowledge are necessary for a healthy lifestyle. For example, a study in Iran showed that awareness and knowledge are important factors related to prehospital delay in patients with acute myocardial infarction. In that study, 64.3% arrived at a hospital 1 hour after symptom onset. To describe the cause behind this delay, 38.8% among these patients mentioned lack of awareness about CHD, and 34.3% mentioned ignoring the symptoms of CHD and self-medication. This suggests that they did not know about CHD or they decided to act against their knowledge of symptoms or thought that self-medication is a good option before attending a hospital. Furthermore, patients with a higher level of education had less prehospital delay (Farshidi, Rahimi, Abdi, Salehi & Madani, 2013). Therefore, the extent of knowledge and awareness of CHD within diverse sections of any population needs to be identified and, if necessary, addressed as a common goal that is tailored to the population in order to maintain a healthy population.

2.10 Summary

After considering the background and reviewing the literature, a number of questions arise, including how much people know about CHD, how much they are aware of CHD,
and the extent to which they follow a healthy lifestyle. Furthermore, on the basis of an individual’s SES, questions arise about whether there are any differences in knowledge, awareness, and lifestyle practices related to CHD, any relationship between knowledge and awareness concerning CHD, and any associations of knowledge and awareness with a person’s lifestyle practices. No study has been reported for Bangladesh that has investigated knowledge, awareness, and lifestyle practices concerning CHD in relation to SES. The current study was designed to find the answers to these questions.
CHAPTER 3

METHODS

3.1 Introduction

This study was conducted in Dhaka city, Bangladesh in 2014 to determine the level of knowledge, awareness, and lifestyle practices related to coronary heart disease (CHD) in the population divided into high socioeconomic status (HSES) and low socioeconomic status (LSES) groups. The methods used for development of the questionnaires, participant recruitment, testing procedures, and data analysis are described in this chapter.

3.2 Study design

A quantitative cross-sectional analytical study design was used.

3.3 Study population

According to the inclusion criteria (Section 3.6.2) of this study, office workers of government and nongovernment organisations, and tradespeople living in slum areas, were recruited in Dhaka, representing HSES and LSES people respectively. The reason for choosing Dhaka is that, being the capital of Bangladesh, it has the largest office workforce as well as the largest number of people (3.5 million out of 5.6 million total estimated slum people in Bangladesh) living in slum areas in Bangladesh (Angeles et al., 2009). There are no definitive data available for the number of professional employees in Dhaka. However, it is the busiest business centre of Bangladesh, making it the largest office workforce in Bangladesh (Dhaka City of Rich People Bangladesh, 2015).

Participants of HSES were chosen on the basis of their place of work, and LSES participants were chosen based on their place of living. Choosing the HSES from their place of work occurred because HSES people’s residences are located in secured places, so it is difficult to access their houses.
The LSES group included people in trades occupations who primarily live in slum areas of the city. Their trades include garment workers, rickshaw operators, and labourers who are mostly classified as belonging to the low socioeconomic group based on income. Several considerations were influential when recruiting the LSES group based on their place of residence. First, people living in slum areas are a more homogeneous group in terms of socioeconomic status (SES) compared with HSES people and they tend to reside in defined residential areas. Second, interviewing prospective LSES participants at their place of work might not have been possible as employers might not have permitted workers to take time off. Third, if I were to recruit LSES people based on their place of work, people with certain occupations, such as bus conductors or street cosmetic traders might have been difficult to recruit. Fourth, in most cases, for example rickshaw operators or drivers, a suitable environment for interviewing might not have been available as their workplace was on the street.

3.4 Sample size

Sample size was determined by power analysis using the formula: \( N = 2 \left( \frac{\delta}{\gamma} \right)^2 \). The combination of \( \alpha \) (Type I error) and power (Type II error) is expressed as \( \delta \). The effect size, \( \gamma = 0.30 \), was set to low for this study. For a two-tailed test with \( \alpha = 0.05 \) and a required high power = 0.90, \( \delta = 3.24 \). Substituting into the formula, \( N = 2 \left( \frac{3.24}{.30} \right)^2 \) indicates that 233 cases would be required in each group (Welkowitz, Ewen, & Cohen, 1982).

3.5 Instruments and equipment

3.5.1 Kupusswami’s socioeconomic scale

No validated socioeconomic measurement scale was available to measure the socioeconomic status of urban people in Bangladesh. Therefore, Kuppuswamy’s socioeconomic scale, developed in India for a population with a similar socioeconomic background to that of Bangladesh, was applied (see B. O. R. Kumar, Dudala, & Rao, 2013). The Kuppuswamy socioeconomic scale is an important measurement tool used in hospital- and community-based research in India. It was first established in 1976 and updated in 2012. In the latest version, the education and occupation scores were modified (Dudala, 2013). Refer to Table 3.1.
Table 3.1

*Kuppuswamy Socioeconomic Scale (Modified) Used in This Study*

<table>
<thead>
<tr>
<th>Item number</th>
<th>Item description</th>
<th>SES score</th>
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<tbody>
<tr>
<td></td>
<td><strong>Level of education</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Professional / honours</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Graduate / postgraduate</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>High school / intermediate / diploma</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Illiterate / primary school</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Occupations</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Legislators, senior officials, and managers</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>Professionals</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Technicians and associate professionals</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>Clerks</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Service workers and shop and market sales workers</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>Skilled agricultural and fishery workers</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Craft and related trades workers</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Plant and machine operators and assemblers</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>Unskilled workers</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Unemployed people</td>
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<table>
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<tr>
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<th>Monthly family income in BDT</th>
<th>Income score</th>
</tr>
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<td>≥ 646.914</td>
<td>≥ 39,832.54</td>
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</tr>
<tr>
<td>2</td>
<td>322.290–644.762</td>
<td>19,910.06–39,831.30</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>241.625–321.917</td>
<td>14,938.76–19,908.81</td>
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<td>4</td>
</tr>
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<td>5977.30–9,952.59</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>32.1757–96.6478</td>
<td>1,989.52–5,976.03</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>≤ 32.1504</td>
<td>≤ 1,988.28</td>
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</tbody>
</table>

For the convenience of the reader, the currency has been converted to Australian dollars (AU$) as well as to Bangladeshi taka (BDT) in Table 3.1. To avoid misclassification due to random sampling, the upper (I), lower / upper lower (IV), and lower (V) socioeconomic statuses were selected using the Kuppuswamy scale. Refer to Table 3.2. Because systematic random sampling was employed, there was a chance of recruiting upper middle SES (II) people within the HSES group in the offices. The Kuppuswami scale was used to disqualify those participants by recording their demographic information. For example, a professional person (occupational score 11) who had completed an honours degree (education score 4) might be the only earning member of his family and earn BDT 38,000 per month (income score 10). The total SES score for that person would be 25, which indicated that he was in of upper middle socioeconomic status (SES score 16–25) and eliminated him as a participant from this study. This happened with regard to only one prospective HSES participant.

Table 3.2

<table>
<thead>
<tr>
<th>Categories of Total Scores in the Kuppuswamy Socioeconomic Scale (Modified) Used in This Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socioeconomic status</td>
</tr>
<tr>
<td>Upper (I)</td>
</tr>
<tr>
<td>Upper middle (II)</td>
</tr>
<tr>
<td>Middle/ Lower middle (III)</td>
</tr>
<tr>
<td>Lower/ Upper mower (IV)</td>
</tr>
<tr>
<td>Lower (V)</td>
</tr>
</tbody>
</table>


The scale was also used to disqualify prospective participants from the lower middle group (III) with Kuppuswamy’s socioeconomic scores of 11–15 in the slums. For example, if a mason (occupation score 4) had attended primary school (education score 1), he might have three earning family members and combined they earned BDT 15,000 per month (income score 6). The total socioeconomic score of that person would be 11, which indicated that he was in the middle / lower middle class group, and that eliminated him from participating in this study. This happened twice in the slum areas.
3.5.2 Questionnaire development

A questionnaire was developed to evaluate participants’ knowledge, awareness, and lifestyle practices in relation to CHD. It may be found in Appendix C. A novel questionnaire was deemed necessary for two main reasons. First, most of the previous studies used close-ended questions, often with “True/False” options; however, for this study, open-ended questions were preferred in the knowledge sections because questions of that kind were regarded as less likely to overestimate the subjects’ level of knowledge (Bradburn, Sudman, & Wansink, as cited in Kandula et al., 2010). Second, previous studies covered limited areas of knowledge, awareness, and lifestyle practices. To obtain additional and appropriate information about all of these domains, a new questionnaire was developed instead of using a preexisting one.

The questionnaire was first developed in English and subsequently translated into Bengali. Some of the questions were adapted from previous studies conducted in different countries that are described in more detail below. The questionnaire was divided into four sections, with each section containing a number of domains. The knowledge section had six domains, the awareness section had seven domains, and the lifestyle practice section contained five domains. See Figure 3.1. The questionnaire was designed to be administered in an interview with participants.

![Figure 3.1. Sections and domains of the questionnaire.](image-url)
3.5.2.1 Sociodemographic information (Section A)

In Section A, questions were asked to obtain sociodemographic information concerning age, marital status, education, employment, and family income.

3.5.2.2 CHD knowledge questions (Section B)

The second part of the questionnaire was designed to assess the participants’ knowledge about CHD. In this regard, most previous studies contained questions about CHD risk factors and CHD symptoms (see Crouch & Wilson, 2011; Gill & Chow, 2010; M. S. Khan et al., 2006; M. S. Khan, et al., 2007; Kim et al., 2011; Margellos-Anast et al., 2006; Saeed et al., 2009; Swanoski et al., 2012; Vaidya et al., 2013; Winham & Jones, 2011; Yahya et al., 2012). However, to evaluate knowledge about CHD, in addition to knowledge questions about risk factors and symptoms, some studies included questions about the participants’ understanding of CHD (see Jafary et al., 2005; Mukattash et al., 2012; Seef, Jeppsson, & Stafstrom, 2013), prevention (see Jafary et al., 2005; Kandula et al., 2010), and epidemiology (see Bergman et al., 2011; Kandula et al., 2010). In addition to knowledge about CHD risk factors, symptoms, prevention, and epidemiology, some information concerning people’s knowledge about CHD pathophysiology and treatment was regarded as important.

Section B of the questionnaire consisted of six subsections to evaluate participants’ level of knowledge about CHD. These six domains were addressed in 16 questions, seven of which had been asked in prior research, and nine of which (Q5, Q7, Q8, Q10, and Q12–Q16) were previously unasked questions.

Of the seven preexisting questions (Q1–Q4, Q6, Q9, and Q11), three questions (Q1–Q3) from Bergman et al. (2011) dealing with epidemiology of CHD were modified. These questions were originally closed-ended. Q1 was structured as an open-ended question due to the nature of the cohort who were investigated, the interview format, and the likelihood that the answers would be very diverse. Q2 was a multiple-choice question (MCQ) and a double response was expected. Bergman et al. used a “True / False” option question; however, I used an MCQ for Q3 inspired from Bergman and colleagues because the pattern of the question was not suitable for Q3. In the pathophysiology subsection, Q4, “What do you understand by heart disease?” was similar to a question used by Jafary et al. (2005) and Mukattash et al. (2012) and was
validated by them. This was an obvious question to obtain an idea about respondents’ understanding of CHD. Q6 in the risk factor domain, Q9 in the symptoms domain, and Q11 in the prevention domain, were taken from previous studies (Jafary et al., 2005; Kandula et al., 2010).

Among the nine new questions, Q5 was added to determine whether participants had a basic knowledge of CVD pathophysiology. In the risk factor domain, Q7 was added to tap people’s understanding about the effects of risk factors for CHD, and Q8 was added to ascertain whether the participants knew the most important risk factor associated with CHD. In the symptom domain, Q10 was added to find out whether participants knew that CHD might be asymptomatic. Q12 and Q13 in the prevention domain were included to identify participants’ thoughts about means of prevention and about why CHD might not be preventable. Three questions about CHD treatment (Q14–Q16) were created to identify how much people knew about modern versus traditional medicine use and treatment options. These questions were regarded as important for exploring possible differences between LSES and HSES people. If the participants, especially those from the LSES group, do not have sufficient knowledge about current treatment options for CHD, they may not be able to seek appropriate help or may seek advice from traditional healers or “pirphokir”.

Of the 16 questions in this section, two were multiple choice, three were formatted with “Yes / No / Do not know” options, and 11 were open ended. An additional question, “What do you think about your level of knowledge about heart disease?” was also included using a Likert scale (Very poor / Poor / Neither poor nor good / Good / Very good). The aim of this question was to compare what participants thought about their own level of knowledge with their actual level of knowledge about CHD.

3.5.2.3 CHD awareness questions (Section C)

The third part of the questionnaire was intended to assess participants’ awareness of CHD. This section comprised six domains (see Appendix C). These tapped awareness of one’s own CHD risk factors, preventive action taken to avoid CHD, awareness of prediagnosed medical conditions related to CHD, awareness of prediagnosed CHD, awareness of one’s family history of CHD, awareness of any known person with CHD, and awareness about the kind of action to take in the event of a heart attack.
In order to address these domains, a total of 17 questions were included in this section, with six questions (Q1, Q2, Q12, Q13, Q16, Q17) taken from previous studies. Eleven questions (Q3–Q11 and Q14–Q15) were new.

Among the six questions from previous studies, Q1 was taken from the American Heart Association (AHA) national survey (Mosca et al., 2013) and modified for the current study to include cardiovascular health rather than physical health. Q2 was originally included in a questionnaire to evaluate awareness of obesity among participants in Tanzania (Nyaruhucha et al., 2003) and was reformatted for the current study as a “Yes / No” answer about CHD. The follow-up questions (Q3 & Q4) following Q2 were new. Two new questions (Q5 & Q6) were also added about awareness of participants’ own risk factors to get a sense of their awareness about the risk factors that existed among them. Five questions (Q7–Q11) about awareness of possible preventive action taken for CHD were also new. Q7 was added to assess how many people were aware of taking preventive action related to CHD. Q8 was included to identify whether any proposed preventive actions taken by the participants had a scientific basis. Q9 was included to identify the reasons for taking any action to prevent CHD. Q10 was intended to identify barriers for which participants could not take any preventive steps, and Q11 was added to investigate participants’ awareness about the consequences of not taking any actions.

On the basis of previous studies about awareness of CVD (Al-Baghli et al., 2010), diabetes mellitus (Cunningham-Myrie et al., 2013), and hypertension (Hammami et al., 2011; Olives et al., 2013; Quasem et al., 2001; Sabouhi et al., 2011; F. White et al., 2009), two questions (Q12 and Q13) were included in a modified form. These questions were included because they deal with prediagnosed medical conditions other than CHD but related to CHD—conditions such as HTN, DM, and high cholesterol, as well as prediagnosed CHD. These questions were modified with regard to their answer options. Instead of retaining only “Yes / No” options, the response options were “Yes / No / Do not know”. The “Do not know” option was included after pretesting the questionnaire among the study population (see Section 3.5.2.5). Two questions about awareness related to taking action in the event of a heart attack (Q16 & Q17) were also included from the AHA survey questionnaire (Mosca et al., 2013). These questions were included to obtain information about what to do in an emergency in the context of Bangladesh because Bangladesh does not have any central operating system for medical
emergencies such as a specific phone number to ring in case of heart attack (WHO, 2014).

3.5.2.4 Questions about lifestyle practices (Section D)

The fourth section of the questionnaire, associated with lifestyle practices, contained 32 questions related to tobacco use, alcohol consumption, diet (including salt consumption and cooking oil consumption), and physical activity. Most of the questions related to lifestyle were closed ended. The follow-up questions of the closed-ended questions were open ended to obtain additional information. For example, if a person reported being an ex-smoker, the follow-up question was “Why did you stop smoking?” All of the follow-up questions related to smoking (Q2–Q6), tobacco chewing (Q8–Q12), and alcohol consumption (Q14–Q18) were new to reflect the diversity of tobacco use in Bangladesh.

Previous studies have used similar questions when assessing lifestyle practices and were either included without modification if applicable or slightly modified for the current study (see Bellow, Epstein, & Parikh-Patel, 2011; Byrne, Walsh, & Murphy, 2005; Crouch & Wilson, 2011; Erenay & Oguz, 2011; Joshi et al., 2007; M. S. Khan et al., 2006; Kim et al., 2011; Muhamad et al., 2012; Sabra et al. 2007; Saeed et al., 2008; Vaidya et al., 2013; Winham & Jones, 2011; Yahya et al., 2012). Q19–Q30 relating to dietary habits, and Q31-Q32 relating to physical activity, were new in this section.

3.5.2.5 Questionnaire validation

The newly designed questionnaire was pretested and validated prior to actual data collection. This is briefly outlined in this paragraph and explained in more detail in the next paragraph. First, a draft version of the questionnaire was distributed to health professionals and members of the public in Australia. After reviewing their answers, several changes were made. The questionnaire was then reviewed by the Research Review Committee (RRC) of the Centre for Control of Chronic Diseases (CCCD) in the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR, B) in Bangladesh after translating it to the local language. After a small number of adjustments, a subsequent draft of the questionnaire was tested on a randomly selected group of people identified within the LSES and HSES for final validation. The aim of pretesting was to determine whether any further revision was necessary concerning
arrangement of questions and clarity of the wording, or whether new items needed to be added for the type of data being sought (Shi, 2008). Although many of the questions were from previous studies and had been validated there, those questions may not have been appropriate for the current study and therefore might have needed to be validated again (see Blair, Czaja, & Blair, 2014, p. 31).

The overall validation procedure occurred in three stages. First, content validity was established for the domains of knowledge, awareness, and lifestyle practices in terms of CHD. An email with a cover letter was sent to all academics in the School of Community Health and School of Nursing, Midwifery and Indigenous Health at Charles Sturt University (CSU), Australia. Eleven among them agreed to participate, and were interviewed using the English version of the questionnaire. They were regarded as experts in the research field. The questionnaire was then sent to them, and a suitable time for interviewing was fixed. During the interview, they were asked about whether the items of the questionnaire adequately assessed CHD knowledge and awareness as well as CHD-related lifestyle practices. They were also requested to make comments related to arrangement of the questions, use of appropriate words, omitted questions, length, and the contents in each of the domains as well as the specific meaning of certain questions.

Following their responses, one question from the knowledge section was removed. This was “Which new factors increase the risk of heart disease?” Lawshe's content validity ratio (CVR) was estimated for this question to evaluate how important it was. The formula for estimating CVR is

\[
CVR = \frac{n_e - \binom{N}{2}}{N/2}
\]

Here, \(n_e\) = the number of panel members indicating “essential”, and \(N\) = the total number of panel members. Substituting into the formula, \(n_e = 2\) and \(N = 11\), CVR for the above mentioned question was \(-0.64\). Content validity ratio values range from \(-1\) to \(+1\). To include a question in a questionnaire that was reviewed by 11 panellists, the minimum value of CVR should be 0.59 (Lawshe, 1975). Therefore, this question was removed. In addition, Q6 in the knowledge section was changed to “Which factors increase the risk of heart disease?” instead of “Which current factors increase the risk of heart disease?” According to the participants’ feedback, Q2–Q4 in the awareness
section might have been excluded from the total awareness score. These questions were retained, however, to obtain extra information about CHD awareness. In the lifestyle practice section, the follow-up questions (Q2, Q8, and Q14) for Q1, Q7, and Q13 were modified, and a number of new questions (Q3, Q4, Q6, Q9, Q10, Q12, Q15, Q16, & Q18) were added.

Following the changes effected in light of the initial feedback, the second stage of questionnaire development involved translating the questionnaire into Bengali and submitting it, along with the research proposal, translated clinical history form, information sheet, and consent form to the Research Review Committee (RRC) and Ethical Review Committee (ERC) of the ICDDR, B in Dhaka, Bangladesh (See Appendix A). The comments made by the RRC and ERC members regarding the questionnaire were addressed and the materials were resubmitted with modifications where needed. The committee members’ comments related to the arrangement of questions, use of appropriate language and phrasing, omitted items, and options for the MCQs. Once the committee granted approval, the final stage for developing the questionnaire commenced.

To ensure that the questionnaire was applicable to both the high and low socioeconomic participants, a third stage of developing the questionnaire involved interviewing 20 people from each of the two SES levels in Bangladesh. Among these, 12 were from the HSES and eight were from the LSES. The answers were again reviewed for appropriate phrasing and to ensure that the intended meaning was understood by the participants. Alterations to the wording were made prior to the final version being used for the study. Further ethics approval was not required at this stage as the changes were minimal. However, despite the validation process, some questions had to be reworded depending on the responses obtained by the participants during the interviewing process, especially in the LSES group.
3.5.3 Clinical history form

A clinical history form was developed with two parts; see Appendix C. Section A contained information about age, sex, history of CHD, diabetes, hypertension and other health problems, and medication use. Section B contained information about height and weight to calculate body mass index (BMI), waist circumference, blood pressure, and blood glucose level (BGL). The procedures for measuring these physiological variables are described in Section 3.8 below. To categorise the BMI, waist circumference, blood pressure, and BGL, definitions are given in Section 3.9, *Definitions of physiological measures*.

3.5.4 Other data collection equipment

A tape recorder was used to audio-record responses. For physiological measures, sphygmomanometer, Accu-Chek blood glucose meter and monitor, glucose test strips and needles, alcohol swabs, band aids, electronic weighing scale, and tape measure were required.

3.5.5 CHD knowledge, awareness, and lifestyle practice scoring procedures

3.5.5.1 Scoring of knowledge about CHD

The CHD knowledge questions were scored to generate a single score reflecting the participants’ level of knowledge about CHD. Given the scoring procedure, the maximum score obtainable for CHD knowledge was 54. Table 3.3 contains information about the scoring process. Of three questions about CHD epidemiology, Q1 was open ended and Q2 and Q3 were MCQs. In Q2, the participants were required to choose two correct answers from four options. Participants who chose two correct answers were given 2, and participants who chose one correct answer were given 1. In the second domain of the knowledge group of questions, Q4 and Q5 addressed knowledge about the CHD pathological process, and were open ended. Q4 (What do you understand by heart disease?) is an example where a variety of responses might be expected because it was an open-ended question. As a result, participants who discussed pathological processes, symptoms, risk factors, and the prognosis of CHD were given a score of 1 for each response.
Q6–Q8 were related to CHD risk factors. The target answer for Q6 was the 13 WHO-recommended traditional risk factors (Table 3.3). The responses that are also related to CHD risk but not mentioned by WHO (2011b) included infection, work stress, and air pollution, and were not considered for scoring.

Table 3.3

Knowledge Questions Scoring Sheet

<table>
<thead>
<tr>
<th>Ques No.</th>
<th>Expected answers of the questions</th>
<th>Maximum score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coronary heart disease/ heart attack/ heart disease</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Males, and females after menopause</td>
<td>2 (1 for each expected response)</td>
</tr>
<tr>
<td>3</td>
<td>Long term disease</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Discussion of pathological process, symptoms, risk factor and prognosis</td>
<td>4 (1 for each expected response)</td>
</tr>
<tr>
<td>5</td>
<td>Malfunction of heart due to inappropriate blood circulation as a result of block of artery due fat deposition/ inappropriate blood circulation as a result of block of artery</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Tobacco (smoking/ chewing), alcohol consumption, unhealthy diet, physical inactivity, HTN, DM, high cholesterol, overweight/ obesity, age, gender, family history, race/ ethnicity and mental stress.</td>
<td>13 (1 for each risk factor)</td>
</tr>
<tr>
<td>7</td>
<td>Appropriate explanations of the process of having CHD due to each risk factors mentioned above</td>
<td>13 (1 for each appropriate explanation)</td>
</tr>
<tr>
<td>8</td>
<td>Smoking</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Chest pain, left arm pain, upper body discomfort (neck pain, shoulder pain, stomach ache, back pain), shortness of breathing (SOB), tiredness, sweating, dizziness and nausea/vomiting.</td>
<td>8 (1 for each symptom)</td>
</tr>
<tr>
<td>10</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Control or avoid risk factor/ lifestyle modification, regular check up, and treatment</td>
<td>3 (1 for each expected response)</td>
</tr>
<tr>
<td>13</td>
<td>This question was asked who answered “no” to question 11 to get the idea of reason behind of “no” response</td>
<td>No mark</td>
</tr>
<tr>
<td>14</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>Medicine, surgery, and lifestyle modification</td>
<td>3(1 for each expected response)</td>
</tr>
<tr>
<td>16</td>
<td>This question was asked who answered “no” to question 13 to get the idea of reason behind of “no” response</td>
<td>No mark</td>
</tr>
</tbody>
</table>

Total score 54
Q7 was asked only of those participants who provided at least one traditional risk factor in Q6. For example, if participants mentioned unhealthy diet as a risk factor in Q6, they were asked to explain how an unhealthy diet played a role in heart disease and they received 1 for a correct explanation. In this way, if respondents were able to explain the pathological process of the 13 risk factors, they would score 13 in Q7.

Q9 and Q10 were asked to identify the level of knowledge relevant to heart attack symptoms. According to the National Heart Foundation of Australia (2011) and the National Institute of Health (2015b), the eight most common symptoms mentioned are listed in Table 3.3. Q11 is related to CHD prevention, and Q12 and Q13 were the follow-up questions to Q11. Treatment was considered to be one of the three correct responses to Q12 as it is a part of secondary prevention. Q14 is concerned with CHD treatment, and Q15 and Q16 were the follow-up questions to Q14.

3.5.5.2 Scoring of awareness about CHD

A total of 17 questions was asked in the awareness section, and among them 11 questions were scored to evaluate participants’ level of awareness about CHD. Refer to Table 3.4. The maximum possible score for CHD awareness questions was 20. Q1–Q4 were not expected to evaluate participants’ awareness because Q1 and Q2 were asked to obtain additional information about CHD awareness, and Q3 and Q4 were asked as follow-up questions to Q2 (see Table 3.4). Q5 and Q6 were asked to evaluate participants’ awareness of their own risk factors and these questions were evaluated together. Q5 was a “Yes / No / Do not know” question. Participants who answered “Yes” received a score of 1. Participants who answered “No” were verified as having done so accurately by their physiological status and lifestyle practices. They received a 1 score if they did not have any risk factor and zero if any single risk factor was present. Participants with a “Do not know” response also scored zero. Q6 was a follow-up question to Q5. This question was evaluated differently. The score for this question was allocated according to the proportion of risk factors the participants identified. For example, if a participant could identify 50% of their own risk factors they would obtain 5 out of 10, and if they could identify all of their own risk factors they scored 10 out of 10, no matter how many risk factors they had. Q7–Q9 were about awareness of taking action to prevent CHD. Participants, who answered “Yes” were also asked two follow-up questions, Q8 and Q9. If their responses to Q8 and Q9 were related to CHD, they
were given a score of 1 for each of Q7–Q9. The answers for Q8 that attracted a score of 1 were, for example, “Avoid or control risk factors or lifestyle modification”. Similarly, for Q9, answers that attracted a score of 1 would have been, “To live longer in a healthy way” or “To prevent heart disease or for overall health”. If the responses were not related to CHD, a zero score for Q7 as well as for Q8 and Q9 was given. For example, “Trying to reduce the effect of formalin by washing fruit” was regarded as an illogical response to Q8. Likewise, “To be neat and clean avoiding smoking and drugs” was not considered an appropriate answer for Q9.

Table 3.4

<table>
<thead>
<tr>
<th>Question No.</th>
<th>Expected answers to the questions</th>
<th>Maximum score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–4</td>
<td>No mark</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Yes / no (cross checked with their lifestyle practice and physiological status)</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>According to the proportion of risk factors participants identified</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>If the response related to CHD; e.g., Lifestyle modification</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>If the response related to CHD or health; e.g., To live longer, to avoid CHD or HTN or DM</td>
<td>1</td>
</tr>
<tr>
<td>10–11</td>
<td>This question was asked who answered “no” to question 7 to get the idea of reason behind of “no” response and whether they had idea of the consequence</td>
<td>No mark</td>
</tr>
<tr>
<td>12</td>
<td>Yes/ no, double checked from the participants’ physiological status and medicine history. If participants responded as “do not know” or provided an incorrect answer or were a new case, they did not achieve any score</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>Yes/ no, no mark for the “do not know” response</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>Yes/ no, no mark for the “do not know” response</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>Yes/ no, no mark for the “do not know” response</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>Seek medical service</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>Seek medical service</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>
Q12–Q15 had “Yes / No / Do not know” options. For Q13–Q15, it was necessary to rely only on the participants’ responses because it was not possible to check for accuracy. For example, Q13 was concerned with self-reported CHD and in this research participants were not examined for all possible CHD risk factors. Q14 and Q15 were concerned with the family history of having CHD and people known to the participants with CHD in their community. Q16 and Q17 were asked in order to identify awareness about taking action after recognising any heart attack symptom(s) in themselves or in others who may have had a heart attack.

### 3.5.5.3 Scoring of lifestyle practices

Lifestyle scores were based on lifestyle practices related to CHD. The scoring scheme is shown in Table 3.5. Five domains of lifestyle practice, namely smoking, tobacco chewing, alcohol consumption, dietary habits, and physical activity were assessed to evaluate participants’ lifestyle practices. For each domain, a maximum score of 1.0 was allocated. In the lifestyle practice section, Q1 and Q5 were concerned with history of smoking, Q7 and Q11 with tobacco chewing status, and Q13 and Q17 with history of alcohol consumption.

The follow-up questions for Q1, Q5, Q7, Q11, Q13, and Q17 were asked to gain a better idea of participants’ consumption status and relevant reasons. These questions were not evaluated for scoring purposes. In the dietary intake section, seven questions were evaluated for scoring purposes. These were Q20, Q21, Q24–Q27, and Q29. To obtain additional information about the dietary intake of the participants, Q19, Q22, Q23, Q28, and Q30 were asked. Respondents eating the recommended level of fruit and vegetables, and who did not consume fast food, soft drinks, and extra salt in their meals received scores. Fruit and vegetables (Q20 and Q21), soft drinks (Q24 and Q25), and fast food consumption (Q26 and Q27) were evaluated together, and in each case a maximum of 0.25 points was given for good practices.

Q31 and Q32 addressed physical activity. Respondents who were physically active at work were given 0.5 in Q31, and participants who engaged in moderate to strenuous levels of physical activity apart from work scored 0.5 in Q32.
Table 3.5

*Lifestyle Practice Questions Scoring Sheet*

<table>
<thead>
<tr>
<th>Question No.</th>
<th>Expected answers of the questions</th>
<th>Maximum score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No</td>
<td>0.5</td>
</tr>
<tr>
<td>2–4</td>
<td>Follow-up questions for Q1</td>
<td>No mark</td>
</tr>
<tr>
<td>5</td>
<td>No</td>
<td>0.5</td>
</tr>
<tr>
<td>6</td>
<td>Follow-up questions for Q5</td>
<td>No mark</td>
</tr>
<tr>
<td>7</td>
<td>No</td>
<td>0.5</td>
</tr>
<tr>
<td>8–10</td>
<td>Follow-up questions for Q7</td>
<td>No mark</td>
</tr>
<tr>
<td>11</td>
<td>No</td>
<td>0.5</td>
</tr>
<tr>
<td>12</td>
<td>Follow-up questions for Q11</td>
<td>No mark</td>
</tr>
<tr>
<td>13</td>
<td>No</td>
<td>0.5</td>
</tr>
<tr>
<td>14–16</td>
<td>Follow-up questions for Q13</td>
<td>No mark</td>
</tr>
<tr>
<td>17</td>
<td>No</td>
<td>0.5</td>
</tr>
<tr>
<td>18</td>
<td>Follow-up questions for Q17</td>
<td>No mark</td>
</tr>
<tr>
<td>19</td>
<td>Additional information</td>
<td>No mark</td>
</tr>
<tr>
<td>20–21</td>
<td>WHO recommended ≥ 5 serves of fruits and vegetables</td>
<td>0.25</td>
</tr>
<tr>
<td>22</td>
<td>Additional information</td>
<td>No mark</td>
</tr>
<tr>
<td>23</td>
<td>Additional information</td>
<td>No mark</td>
</tr>
<tr>
<td>24–25</td>
<td>No (if anybody said “yes” and consumed &lt;5 days in a week in response to Q25, achieved 0.125)</td>
<td>0.25</td>
</tr>
<tr>
<td>26–27</td>
<td>No (if anybody said “yes” and consumed &lt;5 days in a week in response to Q27, achieved 0.125)</td>
<td>0.25</td>
</tr>
<tr>
<td>28</td>
<td>Additional information</td>
<td>No mark</td>
</tr>
<tr>
<td>29</td>
<td>No</td>
<td>0.25</td>
</tr>
<tr>
<td>30</td>
<td>Additional information</td>
<td>No mark</td>
</tr>
<tr>
<td>31</td>
<td>Yes</td>
<td>0.5</td>
</tr>
<tr>
<td>32</td>
<td>Moderate to strenuous activity for Q32</td>
<td>0.5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>
3.5.5.4 Categorisation of knowledge, awareness, and lifestyle practice scores

The knowledge, awareness, and lifestyle practice scores were placed into one of five categories in order to define participants’ level of CHD knowledge, awareness, and lifestyle practices. These categories are shown in Table 3.6.

Table 3.6

<table>
<thead>
<tr>
<th>CHD Knowledge, Awareness, and Lifestyle Practice Scoring Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scores</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>CHD knowledge</td>
</tr>
<tr>
<td>0–10.8</td>
</tr>
<tr>
<td>&gt; 10.8–21.6</td>
</tr>
<tr>
<td>&gt; 21.6–32.4</td>
</tr>
<tr>
<td>&gt; 32.4–41.6</td>
</tr>
<tr>
<td>&gt; 41.6–54</td>
</tr>
<tr>
<td>CHD awareness</td>
</tr>
<tr>
<td>0–4</td>
</tr>
<tr>
<td>&gt; 4–8</td>
</tr>
<tr>
<td>&gt; 8–12</td>
</tr>
<tr>
<td>&gt; 12–16</td>
</tr>
<tr>
<td>&gt; 16–20</td>
</tr>
<tr>
<td>Lifestyle practice related to CHD</td>
</tr>
<tr>
<td>0–1</td>
</tr>
<tr>
<td>&gt; 1–2</td>
</tr>
<tr>
<td>&gt; 2–3</td>
</tr>
<tr>
<td>&gt; 3–4</td>
</tr>
<tr>
<td>&gt; 4–5</td>
</tr>
</tbody>
</table>

In this study, no negative scores were allocated to any of the variables, and, as a result, the scales were unipolar, measuring one dimension from “Poor” to “Very good”. A five-point Likert scale is an odd-point scale and odd numbers in scales allow selecting the middle option such as “Neither poor nor good” (Taylor-Powel, 2008). Reevilla, Saris, and Krosnick (2014) recommended using five-point Likert scales.
because, in terms of quality of measurement, five point Likert scales provide better quality data. As I used a five-point scale, the total scores for knowledge, awareness, and lifestyles practice were divided by 5 to obtain the cut-off value for categorisation.

3.6 Recruitment of participants

3.6.1 Sampling technique

Figure 3.2 is a map of Dhaka city based on SES areas. Data were collected from the highlighted areas. Blue indicates the police precinct for the high socioeconomic group, yellow indicates the police precinct for the low socioeconomic group, and green indicates the police precinct within areas for both socioeconomic groups. The police precincts were chosen instead of commercial areas and slum areas because, considering the geographic hierarchy, the geographic information system (GIS) of ICDDR, B held the data at the level of police precincts and they recommended use of this method.

Seven police precincts of the city were randomly chosen out of a total of 49 police precincts to identify office areas for the HSES sample that was included in the study. Within the seven selected police precincts, eight commercial areas are shown in Figure 3.3. Because Motijheel and Dilkhusha are both major commercial areas of Dhaka, both were chosen within the Motijheel police precinct. A total of 16 buildings were chosen from the eight commercial areas. Two buildings from most areas were involved, although only one building was selected from Panthapath and Segunbagicha because office managers in some of the buildings targeted in Panthapath did not permit the study to be conducted in their offices and Segunbagicha is a very small official area.

Three buildings were chosen from Motijheel and three from Dilkhusha. Buildings were randomly chosen by first determining a sampling interval number from 1 to 10. Then, rotating the tip of a pen in the commercial areas, an initial building was identified and every ninth building was selected for inclusion in the study. If the whole building was occupied by a single organisation, the floors were selected randomly. Then 15 people were selected from each building except from the Segubagicha building, where 13 people participated.
Figure 3.2. Map of Dhaka city showing socioeconomic areas.
Figure 3.3. Diagram showing recruitment of HSES participants.

The building or office manager was approached for permission in the first instance to conduct the study. If the manager did not allow the research to be carried out within the building or office, the next building or office within the building or office was chosen.
In some cases, different organisations shared the same office building. In that case, the organisation for inclusion was chosen randomly. As a result of these procedures, 238 people were selected for the HSES group. If the office manager permitted data collection, the office employees were chosen by approaching each in turn on the floor or office following a request by the office manager to reduce the disruption to work as much as possible during office hours. In case of this research, the response rate or rejection rate could not be definitively assessed. None of the participants refused to participate once I received access to the offices and the slum areas through either managers or owners of the slum areas, respectively. However, out of 16 office managers, four did not permit the study to be conducted in their office places. Considering the managers’ responses, the response rate could be said to be 75% for HSES.

Most of the offices were within banks, insurance companies, and trade houses associated with the share market. Recruiting and interviewing was made difficult due to two major festivals and a political crisis in Bangladesh at the time the study was conducted. Without those disruptions, the response rate might have been higher. Participants who had time for interviewing and were not busy were interviewed. Among the higher officials, the number of females was lower than males because of the gender bias in this workforce, and, for this reason, all the female higher officials who were willing to participate were interviewed intentionally in an attempt to obtain matched-gender data. As a result, the initial stage of sampling from the HSES was systematic random sampling, and the final part of the sampling procedure was purposive sampling.

To choose participants from the LSES areas, a similar procedure for selection of participants in the HSES was followed. Refer to Figure 3.4. Eight police precincts were again randomly chosen, and the eight most proximal slum areas were identified for data collection. Thirty rooms or houses were selected from these slums. Once the slum areas were chosen, the research objectives and interview process were explained to the owner of the house or to people who were also living in the slums and could recommend prospective participants. In some instances, slum people were approached directly to be part of the study and these participants in turn introduced other prospective participants. Later, with the help of the owner or a local person, the houses or rooms were selected randomly by rotating the tip of the pen. This process was followed to obtain easier
access to the rooms of the participants. Otherwise, as an unknown person, in some cases, it would have been difficult to gain access.

The site address number of slum houses or rooms was not available or does not exist. Therefore, the same sampling interval number, 9, was chosen for the slum areas and a commencing/initial house was randomly chosen by the same procedure as used for identifying the initial building for the business area. Then every ninth house or room was selected. After selecting the home, one of the family members was chosen randomly with the permission of the head of the family and considering the inclusion and exclusion criteria (refer to Section 3.6.2 immediately below). If the head of the family was not available, permission was taken from the family member present at that time. If only one family member was at home, that person was requested to be part of the study. If the only family member or all family members did not agree to participate, the adjoining house was selected. In essence, this group of participants was selected using systematic random sampling outlined in Figure 3.4.

Figure 3.4. Diagram showing recruitment of LSES participants.
3.6.2 Inclusion and exclusion criteria

The following people were eligible for inclusion in the study:

1. People aged 18–60 years. (The mean life expectancy of Bangladeshi people is 69 years. The age of retirement for government employees is 60 years and therefore that was chosen as the upper age cut-off limit. As a result, the prospective age range was same for both groups.)

2. Office employees working in government and nongovernment organisations for the HSES group.

3. Tradespeople involved in low-paid work and living in slum areas for the LSES group.

The following people were ineligible to participate:

1. People who were medically unstable.

2. Women who were pregnant. (Pregnant women may acquire knowledge and awareness about cardiovascular risk factors from their antenatal visits. Furthermore, changes in the cardiovascular system develop during pregnancy to meet the increased metabolic demands.)

3. People with noticeable cognitive impairment, intellectual disabilities, or a mental illness.

4. People in existing dependent or unequal relationships (i.e., preexisting relationships between participants and researcher or between participants and others involved in facilitating or implementing the research).

3.7 Duration of pretesting questionnaire and data collection

The first part of the study, involving interviews with Australian health professionals as part of the questionnaire validation process, took place at Charles Sturt University for 2 weeks during May 2014. Later, in Bangladesh, 20 participants were interviewed for 2 weeks during August 2014 as part of the second validation process using the translated questionnaire, information sheet, and consent form. The final data collection occurred during the 4 months of September to December, 2014.
3.8 Method of data collection

A face-to-face interview was performed. This method was chosen as the participants did not need to read or write, and answers become more free-form. In addition, the questions could be explained if the participant did not understand what was being asked. Furthermore, the response rate was expected to be comparatively higher using face-to-face interviewing, especially for a large metropolitan area like Dhaka city (Blair et al., 2014, pp. 69–70; Wood, Kerr, & Brink, 2006, p. 179).

The interview sessions were recorded with the consent of the participant and were subsequently transcribed to avoid errors that might occur while writing responses during the interview. The interviews were performed in a quiet environment. For the HSES group, the manager of every office provided a room for interviewing in which each employee was interviewed individually. For the LSES participants, interviews were performed at their homes. The duration of the interviews and measurement of physiological variables for each participant took approximately 30 minutes.

Because the prime issue in human subject research is participants’ right of self-determination by ensuring informed consent (Dempsey & Dempsey, 2000, p. 125), before commencing each interview, the information sheet was given to the participant. Once they had read the information sheet and had all questions regarding the study answered, the consent form was given to the participants to read and sign. For the LSES group, if participants had difficulty in reading and writing, the information sheet and consent form were read to them. Their signatures were then obtained on the consent form, except for participants who were unable to sign. In those cases, thumb prints were obtained.

Four physiological variables were recorded after the interview. These were BMI, waist circumference, blood pressure, and BGL. Participants’ weight and height were measured using an electronic weighing scale and tape measure to calculate their BMI. To measure participants’ weight, participants were asked to remove any heavy material from their pockets and body including heavy clothing and shoes. They were then asked to stand on the weighing machine after ensuring the scale had been set at zero. During measuring their weight they were asked to look straight and not to move until the digital screen showed settled stable recording. To measure participants’ height, participants
were asked to take off their shoes, socks, and head accessories, and asked to stand against a wall. A scale was placed on the top their head, which was touched to the wall and was marked under the scale. A tape measure then used to measure the mark from the floor. Participants’ waist circumferences were also measured using a tape measure and WHO recommended guidelines were followed. According to the guidelines, the waist circumference was measured at the approximate midpoint between the lower margin of the last palpable rib and the top of the iliac crest in the standing posture, and at the end of normal respiration (WHO, 2011d).

Blood pressure was recorded in a sitting position and obtained twice from the same arm using an Omron® (Kyoto, Japan) automated sphygmomanometer, and the average of the two readings was regarded as a participant’s blood pressure reading. For identifying BGL, a finger-prick test was performed. For this procedure, an Accu-Chek Active (Roche Bangladesh Limited) blood glucose meter and monitor, glucose test strips and needles, and alcohol swabs, were used. The Accu-Chek Active is 100% accurate within 15% of laboratory results at concentrations both < and > 100 mg/dL, thus meeting the International Organisation for Standardisation (ISO) standards for blood glucose meters (Edelman, 2013). According to the 2013 guidelines, the ISO standards require 95% of blood glucose results to be within 15% of laboratory results at concentrations < 100 mg/dL and within 20% at concentrations ≥100 mg/dL (ISO Standards for Blood Glucose Meters, 2017). After taking the blood sample, a band aid was applied over the area of the finger. A participant’s BMI was discussed with the participant if it lay outside the normal range. The test results for blood pressure and BGL were also explained to the participants. Individuals who had abnormal readings were double checked, and if the readings remained high, they were given a copy of the results and a referral letter and were advised to seek advice from their doctor. Participants who did not have any preferred doctor were advised to attend a hospital according to the list of hospitals provided by the ethics review committee of the ICDDR, B.

3.9 Definitions of physiological measures

To categorise the BMI, waist circumference, blood pressure, and blood glucose level, definitions are given below.
3.9.1 BMI

Body mass index (BMI) is a simple index of weight-for-height ratio that is commonly used to classify underweight (< 18.5 kg / m²), normal weight (18.5–23 kg / m²), overweight (23–27.5 kg / m²), and obesity (27.5 kg / m²) in adults among the Asian population, including Bangladeshis (Barba et al., 2004).

3.9.2 Waist circumference

Central obesity was determined based on waist circumference of the participants. The cut-off value of waist circumference for South Asian males and females are ≥ 90cm and ≥ 80 cm, respectively (International Diabetes Federation, 2006).

3.9.3 Blood pressure

According to the National guidelines for management of hypertension in Bangladesh, the definition and classification of hypertension is as follows: optimal blood pressure (systolic blood pressure < 120 mmHg and/or diastolic blood pressure < 80 mmHg), prehypertension (systolic blood pressure 120–139 mmHg and/or diastolic blood pressure 80–89 mmHg, and hypertension (systolic blood pressure 140– > 180 mmHg and/or diastolic blood pressure 90– >110 mmHg) (Directorate General of Health Services, National Heart Foundation Hospital and Research Institute, & WHO, 2013).

In this thesis, participants who had an optimal blood pressure and did not have a history of previously diagnosed hypertension were defined as nonhypertensive. Participants were defined as “potential prehypertensive” if they did not have any history of previously diagnosed hypertension and their blood pressure was within the prehypertensive range during data collection. Participants who did not have any history previously diagnosed hypertension and were measured as hypertensive at the time of data collection were defined as “potential new cases”. To confirm the diagnosis of high blood pressure it is nessesary to take the blood pressure readings 2–3 times at several medical appoinments (National Institute of Health, 2015c) which was not possible in this research due to time constraints, and therefore the term “potential” has been used. Participants who were previously clinically diagnosed as hypertensive and reported themselves as hypertensive were defined as “self-reported hypertensive”.

3.9.4 Blood glucose level

In this thesis, participants who did not report a history of diabetes and had a random blood glucose level of < 7.8 mmol/L based on random blood glucose results at the time of interview were described as “nondiabetic”. Participants were defined as “possible new case of diabetes” if they did not report a history of diabetes and had a random level of ≥ 11.1 mmol/L based on random blood glucose results at the time of interview. Participants were defined as “possibly prediabetic” if they had a BGL level at 7.8–11.0 mmol/L randomly. These cut-off values were based on the guidelines for diabetes by WHO (Schneider, Shaw, & Zimmet, 2003). To confirm or disconfirm the diagnosis of diabetes for the people who do not have the symptoms of diabetes, it is necessary to perform at least one additional plasma venous test on another day (WHO & IDF, 2006). Therefore, the term “possible” was used before “new cases of diabetes” and “prediabetes” after measuring their blood glucose twice in a 2-hour interval. Participants who reported that they had clinically diagnosed DM were defined as “old cases of DM”.

3.9.5 Self-reported CHD

Participants who reported that they had clinically diagnosed CHD were defined as “self-reported CHD” as no diagnostic procedure was performed at the time of interviewing.

3.10 Data processing and analysis

Demographic and clinical data were analysed using the Statistical Package for the Social Sciences (SPSS, Version 20, IBM) and Microsoft Excel. Responses to the knowledge, awareness, and lifestyle practice questions were also coded and entered in SPSS. Two of the knowledge questions (Q4 & Q5 in Section B of the questionnaire) were analysed based on thematic analysis according to the responses of the participants, as these were open-ended questions. For open ended questions where multiple responses were provided by the respondents in response to a question such as “List the risk factors for CHD”, each unique response, for example, smoking, physical inactivity, unhealthy diet was entered in separate columns in SPSS and coded as “Yes = 1” or “No = 2” if participants stated this response or not. For example, in the knowledge section, Q2, Q4, Q5, Q6, Q9, Q12, Q13, Q15, and Q16 were open-ended questions of this type. For open-ended questions that allowed only a single response, the 10 most frequently reported responses were used in the analysis and coded from 1 to 9 and the remaining
responses were coded as “others” in SPSS. In the knowledge section, Q1 and Q8 are the examples of such questions.

The descriptive results were expressed as percentages for categorical variables and means ± SDs for continuous variables. Goodness of fit chi-square tests were performed for categorical variables to identify differences between the HSES and LSES participants. For most analyses, $p$ values < 0.05 were regarded as statistically significant. However, to avoid Type I errors, a Bonferroni adjustment was applied in two cases. In these cases, statistical significance was set at $p < 0.0023$ for the responses for CHD knowledge of risk factors, and $p < 0.0031$ was used for responses concerning symptoms of heart attack.

To identify associations between variables for the whole sample, and for HSES and LSES participants separately, Spearman’s rank order correlation coefficients were performed. These analyses included the associations between overall knowledge and awareness, knowledge and lifestyle practices, and awareness and lifestyle practices.

All combinations of all variables and controls of age and gender were modelled using multiple regressions and ranked according to AIC. AIC is a second order variant of Akaike’s information criterion (AIC) and is corrected for finite sample sizes. AICc converges to AIC for large n and should be employed regardless for model selection (Burnham & Anderson, 2002). The AIC allows a comparison of the models generated by giving an indication of how the models compare and accurately describing the data. Statistical models where the AIC $\Delta_i < 2$ have substantial empirical support; models where the $\Delta_i$ is between 4 and 7 suggest considerably less support; and models where $\Delta_i > 10$ indicate essentially no support (Burnham & Anderson, 2002). Multicollinearity was checked with VIF (variance inflation factor), and the normal distribution was defined by coefficient of kurtosis $\leq 2$ (Bulmer, 1979, p. 64). The top models were checked for goodness of fit and significance measures ($p$ value, pseudo R-squared, and classification table) before selection.

As the study is cross-sectional in nature, associations between knowledge and awareness, knowledge and lifestyle practices, and awareness and lifestyle practices only were investigated. It is not claimed that knowledge is the causal factor for awareness,
and lifestyle practices. Similarly, awareness is not claimed as a causal factor for lifestyle and, and lifestyle as the causal factor of physiological variables.

3.11 Ethical considerations

3.11.1 Human Research Ethics Committee (HERC)

The research proposal, questionnaire, information sheet, consent form, and clinical history sheet for this study were submitted with the completed application form to Charles Sturt University’s (CSU) Human Research Ethics Committee (HREC), and were approved. The approval number was 2013/025. See Appendix A.

3.11.2 Research Review Committee (RRC)

The proposal was first reviewed by RRC of the CCCD at ICCDR, B. A completed application form of the RRC containing the proposal, both English and Bengali versions of the questionnaire, clinical history form, consent form, information sheet, and other information was submitted to the committee and was approved.

3.11.3 Ethical Review Committee (ERC)

To obtain ethics approval in Bangladesh, an application form for the Ethical Review Committee (ERC) of the ICDDR, B containing the proposal, both English and Bengali versions of the questionnaire, the clinical history form, consent form, information sheet, list of the hospitals for referral, a format of referral note, and other information was required. These documents were submitted and were approved in September 2014. The protocol number of this approval was PR-14071.
4 RESULTS

4.1 Introduction

This chapter provides the findings from data collected in Dhaka city, Bangladesh via questionnaires examining the differences in knowledge, awareness, and lifestyle practices related to CHD, and the relationships between those variables, for people with a high socioeconomic status (HSES) and those with a low socioeconomic status (LSES).

The results are arranged in eight sections. This first section provides a brief introduction to the chapter. The second and third sections contain a description of the participants’ sociodemographic characteristics and provide information about the participants’ health status; the fourth, fifth, and sixth sections describe the participants’ levels of knowledge, awareness, and lifestyle practices related to CHD, and also compare the two socioeconomic groups using both descriptive and inferential statistics. In the seventh section, the associations between knowledge, awareness, lifestyle practices, age, and gender are explored within, and compared between, each socioeconomic group, and an attempt is then made to identify the predictors of knowledge, awareness, and lifestyle practices using Spearman’s rank order correlation coefficients and multiple regression analyses. The eighth section contains some in-depth responses of the participants relating to their demographic characteristics, knowledge, awareness, and lifestyle practices about CHD.

4.2 Sociodemographic characteristics of participants

Among the 478 participants, 238 were from the HSES and 240 from the LSES. Demographic information about the participants is provided in Table 4.1. Participants’ ages ranged from 18 to 60 years. The mean ± SD age of participants from the HSES group (40.27 ± 9.5 years) was significantly higher than that of participants from the LSES group (29.53 ± 10.3 years), t (476) = 11.90, p < .001. The LSES participants were significantly younger, mostly between 18 and 27 years of age, and there were
significantly more older participants in the HSES group (38–60 years). Refer to Table 4.1.

In the HSES group, the number of male participants was 2.5 times greater than the number of females because data had been collected from workplaces for HSES participants and in Bangladesh gender inequality exists in employment (A. Alam, 2017). However, in the LSES group the proportion of male participants compared with female participants was not remarkably higher as all LSES participants were recruited from their residences.

Participants’ level of education, domiciliary location, occupation, and income differed significantly because the Kuppuswami socioeconomic scale had been used to classify the two socioeconomic groups. The maximum educational attainment among LSES participants was the HSC (Higher Secondary School Certificate), whereas the minimum educational attainment for HSES participants was at the bachelor/honours level. Most of the HSES participants (67.2%) held a postgraduate degree, while most of the LSES participants (45%) had no more than a primary school education. All of the HSES participants were employed by dint of them being recruited from their workplaces. The lower percentage of employed people in the LSES group is largely due to recruitment from their place of residence. Another explanation for the difference in employment status might be the time when the participants were interviewed (usually 9 a.m. to 8 p.m.) when it is more likely that men were at work and women were at home with younger children.

The professions of HSES participants included higher officials in insurance companies (37%), bankers (35.3%), industrialists (10.5%), senior officials in business organisations (10.1 %), higher officials in Bangladesh customs (5.0%), and a few legal officers, architects, and engineers. Among the LSES participants, 77.5% were labourers, 7.9% were trade workers, and 14.6% were categorised as others. Garment workers comprised 37.5% of the labourers, 16.7% were factory workers, 12.5% were housemaids, 6.2% were rickshaw operators, and 3.3% were in construction. Within the trade workers category, 3.8% were drivers, 1.7% masons, 1.7% electricians, and 1.7% were vehicle spray painters. Small numbers of LSES participants were messengers, shopkeepers, cooks, bus conductors, fish sellers, vegetable sellers, security guards,
Table 4.1
Sociodemographic Characteristics of Participants

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>HSES n (%)\textsuperscript{a}</th>
<th>LSES n (%)\textsuperscript{a}</th>
<th>(\chi^2)\textsuperscript{b}</th>
<th>(p)\textsuperscript{c}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–27</td>
<td>14 (5.9)</td>
<td>121 (50.4)</td>
<td>131.61</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>28–37</td>
<td>82 (34.5)</td>
<td>69 (28.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38–47</td>
<td>86 (36.1)</td>
<td>36 (15.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48–60</td>
<td>56 (23.5)</td>
<td>14 (5.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>170 (71.4)</td>
<td>131 (54.6)</td>
<td>13.83</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Female</td>
<td>68 (28.6)</td>
<td>109 (45.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>206 (86.6)</td>
<td>164 (68.3)</td>
<td>22.77</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Unmarried</td>
<td>29 (12.2)</td>
<td>68 (28.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widow/ Widower</td>
<td>2 (0.8)</td>
<td>6 (2.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>1 (0.4)</td>
<td>2 (0.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never been to school</td>
<td>0 (0.0)</td>
<td>47 (19.6)</td>
<td>478</td>
<td>&lt; .001</td>
</tr>
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<td>Primary school</td>
<td>0 (0.0)</td>
<td>108 (45.0)</td>
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<td></td>
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<tr>
<td>Secondary school</td>
<td>0 (0.0)</td>
<td>50 (20.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSC</td>
<td>0 (0.0)</td>
<td>21 (8.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HSC</td>
<td>0 (0.0)</td>
<td>14 (5.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate (bachelor/</td>
<td>78 (32.8)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>honours)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postgraduate</td>
<td>160 (67.2)</td>
<td>0 (0.0)</td>
<td></td>
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</tr>
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<td>Employment status</td>
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<td></td>
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<tr>
<td>Employed</td>
<td>238 (100.0)</td>
<td>216 (90.0)</td>
<td>23.01</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Unemployed</td>
<td>0 (0.0)</td>
<td>24 (10.0)</td>
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</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>238 (100.0)</td>
<td>0 (0.0)</td>
<td>478</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Trades worker</td>
<td>0 (0.0)</td>
<td>19 (7.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labourer</td>
<td>0 (0.0)</td>
<td>186 (77.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0 (0.0)</td>
<td>35 (14.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 6,000 BDT</td>
<td>0.0 (0)</td>
<td>63 (26.2)</td>
<td>478</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>6,000–10,000 BDT</td>
<td>0.0 (0)</td>
<td>177 (73.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40,000–49,999 BDT</td>
<td>23 (9.7)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 50,000 BDT</td>
<td>215 (90.3)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(\textsuperscript{a}\) Percentages were estimated within socioeconomic group.

\(\textsuperscript{b}\) Chi-square tests are appropriate only when all expected cell counts exceed 5.

\(\textsuperscript{c}\) \(p\) values of were obtained using Pearson’s chi-square test for whole sample.
street cosmetic traders, and delivery boys. A gap between the ranges of income of the two socioeconomic groups is noticeable in Table 4.1. The maximum income for LSES participants was about BDT 10,000 and the minimum family income among the HSES participants was BDT 40,000 because of using the Kuppusswami scale to recruit the participants of two SES groups.

4.3 Participants’ physiological status and medication history

Information about the participants’ physiological status is provided in Table 4.2 and described within Sections 4.3.1 to 4.3.4. Information about the participants’ medication history is provided in Section 4.3.5.

4.3.1 Body mass index and waist circumference

According to body mass index (BMI) values, over 50% of participants in the HSES were overweight and nearly one quarter were obese, with only a very small percentage being underweight. Refer to Table 4.2. This differs remarkably from the LSES group in which the majority of participants had an ideal BMI. A much larger proportion compared with the HSES were, however, underweight. There was overall a significant difference in BMI values between the two socioeconomic groups, indicating higher BMI values in the HSES group, \( \chi^2 (1) = 109.62, p < .001 \).

More than 37% of the participants had a waist circumference that indicated central obesity, and the percentage was higher among HSES participants. This reflected the findings for BMI values. Waist circumference data for male and female participants are presented separately in Table 4.2 because the cut-off values regarding waist circumference differ for each gender. One third of all male participants had a high waist circumference, and there was a much greater proportion within the HSES participants (Table 4.2). For females, high waist circumferences were also more prevalent in the HSES group than in the LSES group, with nearly twice as many females having a high waist circumference in the HSES.
Table 4.2
*Physiological Status of Participants*

<table>
<thead>
<tr>
<th>Category</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>$\chi^2$/$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ideal weight (18.5 – &lt;23 kg/m²)</td>
<td>45 (18.9)</td>
<td>103 (42.9)</td>
<td>96.12</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Obese (≥ 27.5 kg/m²)</td>
<td>53 (22.3)</td>
<td>17 (7.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight (23 – &lt; 27.5 kg/m²)</td>
<td>137 (57.6)</td>
<td>75 (31.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight (&lt;18.5 kg/m²)</td>
<td>3 (1.3)</td>
<td>45 (18.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean BMI ± SD $^d$</td>
<td>25.53 ± 3.1</td>
<td>21.95 ± 3.8</td>
<td>109.62</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Waist circumference (WC)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (WC ≥ 90cm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>77 (45.3)</td>
<td>17 (13.0)</td>
<td>34.49</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>No</td>
<td>93 (54.7)</td>
<td>114 (87.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD WC (cm) $^d$</td>
<td>89.17 ± 7.8</td>
<td>78.41 ± 9.4</td>
<td>10.86</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Female (WC ≥ 80cm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>48 (70.6)</td>
<td>38 (34.9)</td>
<td>19.99</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>No</td>
<td>20 (29.4)</td>
<td>71 (65.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD WC (cm) $^d$</td>
<td>85.35 ± 10.5</td>
<td>76.91 ± 10.8</td>
<td>5.130</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Blood pressure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-hypertensive</td>
<td>43 (18.1)</td>
<td>99 (41.2)</td>
<td>47.54</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Potential new cases</td>
<td>51 (21.4)</td>
<td>29 (12.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential pre-hypertensive</td>
<td>90 (37.8)</td>
<td>95 (39.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-reported HTN</td>
<td>54 (22.7)</td>
<td>17 (7.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD SBP (mmHg) $^d$</td>
<td>123.69 ± 13.8</td>
<td>115.78 ± 13.6</td>
<td>6.30</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Mean ± SD DBP (mmHg) $^d$</td>
<td>84.96 ± 11.1</td>
<td>77.66 ± 10.6</td>
<td>7.36</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>BGL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-diabetic</td>
<td>180 (75.9)</td>
<td>213 (88.8)</td>
<td>18.51</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Possible new cases</td>
<td>8 (3.4)</td>
<td>6 (2.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible pre-diabetic</td>
<td>24 (10.1)</td>
<td>17 (7.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old cases of DM</td>
<td>24 (10.2)</td>
<td>4 (1.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD BGL (mmol/L) $^d$</td>
<td>6.75 ± 2.9</td>
<td>6.23 ± 2.4</td>
<td>2.14</td>
<td>.034</td>
</tr>
<tr>
<td><strong>History of CHD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11 (4.6)</td>
<td>6 (2.5)</td>
<td>1.01</td>
<td>.315</td>
</tr>
<tr>
<td>No</td>
<td>227 (95.4)</td>
<td>234 (97.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a* Percentages were estimated within each socioeconomic status.

*b* Chi-square tests are appropriate only when all expected cell counts exceed 5.

*c* For categorical variables $p$ values were estimated using Pearson’s chi-square test. For continuous variables, $t$-tests were performed.

*d* Variables not expressed as N and percentages: BMI = body mass index, BGL = blood glucose level, CHD = coronary heart disease, HTN = hypertension.
4.3.2 Blood pressure

Across all participants, 14.9% reported that they had clinically diagnosed hypertension, and the condition was higher among those in the HSES group, with 22.7% and 7.1%, respectively, within each group. Blood pressure readings at the time of the interviews indicated a further 16.7% of potential new cases who did not know about their high blood pressure. The percentage of those in the HSES group was nearly twice as high as in the LSES group, nearly reaching one quarter of participants in the HSES group. Prehypertension (systolic blood pressure 120–139 mmHg or diastolic blood pressure 80–89 mmHg; Directorate General of Health Services, National Heart Foundation Hospital and Research Institute, & WHO, 2013) was also more prevalent in the HSES group (Table 4.2). The number of participants with optimal systolic blood pressure (< 120 mmHg; Directorate General of Health Services, 2013) was higher among LSES participants, with just over 50% compared with the HSES group. Mean systolic blood pressure was higher among the HSES participants but was not within the pathological range. Diastolic blood pressure was similarly distributed across the two SES groups (Table 4.2).

4.3.3 Blood glucose level

Of the HSES participants, 10.2% reported a history of diabetes. This was five times higher compared with the LSES group (Table 4.2). Nearly 3% were possible new cases of diabetes (participants who did not report a history of diabetes and had a random glucose of ≥ 11.1 mmol/L based on random blood glucose results at the time of interview), and the proportion was not different between the two socioeconomic groups. In the HSES group, 10.1% were possibly prediabetic based on the WHO guidelines for the prediabetic BGL level (7.8–11.0 mmol/L randomly; Schneider, Shaw, & Zimmet, 2003), and 7.1% in the LSES group were prediabetic. There was no major difference in the mean BGL between the HSES and LSES participants.

4.3.4 History of CHD

According to entries in Table 4.2, 4.6% of HSES participants and 2.5% of LSES participants reported clinically diagnosed CHD. Although the percentage for HSES participants was higher than that of LSES participants, the difference was not statistically significant.
4.3.5 Medication history for HTN, diabetes, high cholesterol, and CHD

Among all participants with self-reported hypertension (HTN), more than one quarter (26.4%) were not taking any antihypertensive medication. In the LSES group, among 52.9% of participants who were prescribed antihypertensive medication, more than half of them reported that they were not taking the medication. That was considerably higher than in the HSES group. Refer to Table 4.3.

Among the participants from the total sample who had a history of prediagnosed diabetes, a little under one third (28.6%) were not taking any prescribed antihyperglycaemic medication. The percentage of the nonmedicine takers was much higher among LSES diabetic participants (75%) than among the HSES diabetic participants (20.8%) (Table 4.3). Only the HSES participants reported high cholesterol, and three quarters of them were taking lipid-lowering medication (Table 4.3).

Table 4.3
Medications Used by Participants

<table>
<thead>
<tr>
<th>Category</th>
<th>HSES (%) a</th>
<th>LSES (%) a</th>
<th>χ² b</th>
<th>p  c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antihypertensive medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>44 (81.5)</td>
<td>8 (44.4)</td>
<td>7.48</td>
<td>.006</td>
</tr>
<tr>
<td>No</td>
<td>10 (18.5)</td>
<td>10 (55.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antihyperglycaemic medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19 (79.2)</td>
<td>1 (25.0)</td>
<td>2.63</td>
<td>.105</td>
</tr>
<tr>
<td>No</td>
<td>5 (20.8)</td>
<td>3 (75.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antihyperlipidaemic medication d</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (76.9)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>3 (23.1)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHD medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11 (100.0)</td>
<td>3 (50.0)</td>
<td>3.68</td>
<td>.055</td>
</tr>
<tr>
<td>No</td>
<td>0 (0.0)</td>
<td>3 (50.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a Percentages were estimated within each socioeconomic status.

b Chi-square tests are appropriate only when all expected cell counts exceed 5.

c p values were estimated using Pearson’s chi-square test.

d Chi-square was not performed as no participants of the LSES reported with high cholesterol.
The reasons that LSES people gave for not taking their prescribed medicine were inability to afford medicines and, for a few female participants, they attributed it to their husbands’ carelessness. For HSES participants, reasons for not taking medication included their fear that if they took medication they would be dependent on it and would have to take medicines for the rest of their life, and that they could manage their diabetes sufficiently well by modifying their lifestyle behaviours. Another reason for some participants of both groups was that they thought they did not need the medication, which indicated their negligence in taking prescribed medication.

As with high cholesterol, it was necessary to rely on participants’ responses to obtain information about their CHD status. All of the HSES participants with prediagnosed CHD were taking medication, whereas only 50% of LSES participants with CHD were doing so.

### 4.4 Participants’ knowledge about CHD

#### 4.4.1 The CHD knowledge score

The CHD knowledge score represents participants’ overall level of knowledge regarding CHD. The overall mean ± SD for this score was 14.20 ± 6.1. There was a significant difference between the mean knowledge score of HSES (18.77 ± 4.0) and LSES (9.66 ± 4.1) groups, \( t (475.9) = 24.66, p < .001, 95\% \text{ CI} [8.389, 9.841]. \) Approximately three quarters of the HSES participants had a poor level of knowledge and, compared with LSES participants, the percentage was nearly two times higher, as three fifth of LSES participants had a very poor level of knowledge. Refer to Figure 4.1. None of the participants in either group had a good or very good level of knowledge. For example, in order to have a good score concerning CHD symptoms, participants were required to mention at least five symptoms out of eight that are related to a heart attack. The criterion for a good level of knowledge was > 32.4 out of a total knowledge score of 54.

In response to the self-perceived knowledge question, “What do you think is your level of knowledge about heart disease?” the participants reported their level of knowledge to be one step higher. Almost three quarters (72.7%) of HSES participants thought they had neither a poor nor a good level of knowledge. In contrast, a roughly
equal percentage (71.6%) of LSES participants thought they had a poor level of knowledge—one level lower than that of the HSES participants.

![Figure 4.1](image)

*Figure 4.1.* Levels of knowledge about CHD for the two socioeconomic groups.

### 4.4.2 Knowledge about CHD epidemiology

Information about the participants’ knowledge concerning CHD epidemiology is provided in Table 4.4 and described within Sections 4.4.2.1 to 4.4.2.3 inclusive.

#### 4.4.2.1 Leading cause of death

With regard to the question about the leading cause of death, a single participant from the HSES group did not provide an answer because he thought the question was statistically inappropriate. Approximately half of the participants from both socioeconomic groups were not able to choose the correct answer, namely that heart attack / heart disease was the leading cause of death in Bangladesh at the time the survey was conducted (A. K. M. M. Islam & Majumder, 2013). In the LSES group, 17.9% said they did not know the correct answer, compared with 2.1% in the HSES group (Table 4.4). All responses to this question are given in Table D.1 in Appendix D. A variety of responses that were obtained were regarded as “other” in that table. Among those responses, some were interesting. They included arthritis, migration to a foreign country, misdiagnosis, and weakness.
Table 4.4

Participants’ Knowledge About CHD Epidemiology

<table>
<thead>
<tr>
<th>Knowledge category</th>
<th>HSES (%) a</th>
<th>LSES (%) a</th>
<th>$\chi^2$ b</th>
<th>$p$ b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leading cause of death c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart attack / heart disease</td>
<td>119 (50.0)</td>
<td>118 (49.2)</td>
<td>37.61</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Stroke</td>
<td>20 (8.4)</td>
<td>19 (7.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>94 (39.5)</td>
<td>60 (25.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not know</td>
<td>5 (2.1)</td>
<td>43 (17.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People most affected by CHDd</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Only males</td>
<td>188 (79.0)</td>
<td>133 (55.4)</td>
<td>9.42</td>
<td>.002</td>
</tr>
<tr>
<td>Only females after menopause</td>
<td>4 (1.7)</td>
<td>14 (5.8)</td>
<td>5.56</td>
<td>.018</td>
</tr>
<tr>
<td>Males and females after menopause</td>
<td>29 (12.2)</td>
<td>9 (3.8)</td>
<td>10.74</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Term of disease c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long term</td>
<td>201 (84.5)</td>
<td>179 (74.6)</td>
<td>10.83</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Short term</td>
<td>34 (14.3)</td>
<td>47 (19.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both</td>
<td>1 (0.4)</td>
<td>2 (0.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not know</td>
<td>2 (0.8)</td>
<td>12 (5.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a Percentages were estimated within each socioeconomic status.
b Chi-square tests are appropriate only when all expected cell counts exceed 5.
c For single response questions, $p$ values were estimated using Pearson’s chi-square test.
d For multiple response questions, $p$ values were estimated comparing the percentages of HSES and LSES columns using goodness of fit chi square test with $df = 1$.

4.4.2.2 People most affected by heart disease

Participants were asked who was more affected by CHD with regard to gender. For this question, participants could choose more than one option. If a participant chose either males or females after menopause, the answer was considered to be partially correct. For a completely correct answer, they should have chosen both males and females after menopause. Few people chose the fully correct answer, but the percentage of those in the HSES group was about three times as high as in the LSES group (Table 4.4). The option of females before menopause was selected by 6.2% of LSES participants, and a similar percentage of LSES participants did not know the answer.
4.4.2.3 Duration of heart disease

Entries in Table 4.4 indicate that more than 84% of HSES participants and 75% of LSES participants answered that CHD was a long-term disease. Among the LSES participants, 5% did not know the answer. A very small number of participants from both groups replied that the disease was both long term and short term, and by way of explanation they stated that if a person survived a heart attack, they considered the disease to be long term, and if the person died it should be regarded as a short-term disease.

4.4.3 Knowledge about CHD pathophysiology

Information about the participants’ knowledge concerning CHD pathophysiology is provided in Table 4.5 and described within Sections 4.4.3.1 and 4.4.3.2.

Table 4.5

Participants’ Knowledge About CHD Pathophysiology

<table>
<thead>
<tr>
<th>Categories</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>χ²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding of CHD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pathological process</td>
<td>148 (62.2)</td>
<td>26 (10.8)</td>
<td>86.67</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Symptoms</td>
<td>67 (28.2)</td>
<td>163 (7.9)</td>
<td>39.24</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Risk factors</td>
<td>102 (42.9)</td>
<td>57 (23.8)</td>
<td>13.08</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>CHD sequelae</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malfunction of heart due to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>inappropriate blood circulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>resulting from narrowing /</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>blockage of arteries as a result of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fat deposition</td>
<td>195 (81.9)</td>
<td>54 (13.0)</td>
<td>160.66</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Do not know</td>
<td>23 (9.7)</td>
<td>179 (74.6)</td>
<td>119.24</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

a Percentages were estimated within socioeconomic status.
b p values were estimated comparing the percentages of HSES and LSES columns using goodness of fit chi-square test with df = 1.

4.4.3.1 General knowledge about CHD

In response to the open-ended question “What do you know about CHD?” significant differences in responses were found regarding pathological processes, risk factors, and symptoms of heart attack. Refer to Table 4.5. HSES participants mostly discussed
pathological processes and risk factors, whereas LSES participants mainly discussed symptoms of heart attack.

LSES participants mostly (16.7%) referred to about the prognosis of the CHD which was about three times higher than in HSES (5.5%). Within the LSES, 11.2% of participants indicated that they did not know anything about CHD including what the heart is or where it is located, while among HSES participants a lack of knowledge was very low (0.4%). Other responses were related to treatment of CHD and economic variables related to CHD and its diagnosis.

4.4.3.2 CHD sequelae

Participants were asked about the changes that take place after a person had CHD. The responses differed noticeably between the two groups (Table 4.5). More than 80% of HSES participants were able to answer correctly that CHD is a malfunction of the heart due to narrowing/blockage of arteries as a result of fat/cholesterol deposition, whereas only a few of the LSES participants chose the correct answer and nearly three quarters of that group’s participants (74.6%) responded they did know the answer. Table D.2 in Appendix D displays the distribution of responses to this question. A small number of responses were regarded as “other” in that table. Some answers demonstrated considerable misunderstanding, including a hole in the heart, atrophy of the heart, veins becoming hot, death, the colour of blood becoming black, that heart disease is hypertension, and that reduced blood circulation in the brain leads to vessel rupture that results in a blood clot that prevents the heart from pumping properly.

4.4.4 Knowledge about CHD risk factors

4.4.4.1 Risk factors identified by participants

There were a number of highly significant differences between the two socioeconomic groups concerning knowledge about CHD risk factors. Refer to Table 4.6.

The most frequently mentioned risk factor among HSES participants was unhealthy diet (83.6%), and among LSES participants the most frequently mentioned risk factor was mental stress (42.5%). With the exception of mental stress, unhealthy diet (29.6%), and smoking (20%), very few LSES participants were able to indicate other traditional risk factors, as indicated by the percentages being less than 10%.
<table>
<thead>
<tr>
<th>Categories</th>
<th>HSES (%) (^a)</th>
<th>LSES (%) (^a)</th>
<th>(\chi^2)</th>
<th>(p) (^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unhealthy diet</td>
<td>199 (83.6)</td>
<td>71 (29.6)</td>
<td>61.83</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Mental stress</td>
<td>135 (56.7)</td>
<td>102 (42.5)</td>
<td>4.88</td>
<td>.027</td>
</tr>
<tr>
<td>Smoking</td>
<td>126 (52.9)</td>
<td>48 (20.0)</td>
<td>35.69</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>128 (53.8)</td>
<td>18 (7.5)</td>
<td>83.78</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>110 (46.2)</td>
<td>5 (2.1)</td>
<td>96.60</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Hypertension</td>
<td>85 (35.7)</td>
<td>21 (8.8)</td>
<td>39.13</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Alcohol consumption</td>
<td>53 (22.3)</td>
<td>18 (7.5)</td>
<td>17.45</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Obesity</td>
<td>44 (18.5)</td>
<td>12 (5.0)</td>
<td>18.52</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>42 (17.6)</td>
<td>5 (2.1)</td>
<td>29.44</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Work stress</td>
<td>8 (3.4)</td>
<td>35 (14.6)</td>
<td>16.71</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Family history</td>
<td>29 (12.2)</td>
<td>2 (0.8)</td>
<td>23.87</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Sleeping disturbance</td>
<td>18 (7.6)</td>
<td>10 (4.2)</td>
<td>2.40</td>
<td>.121</td>
</tr>
<tr>
<td>Age</td>
<td>17 (7.1)</td>
<td>10 (4.2)</td>
<td>1.92</td>
<td>.166</td>
</tr>
<tr>
<td>Food adulteration</td>
<td>15 (6.3)</td>
<td>5 (2.1)</td>
<td>5.0</td>
<td>.025</td>
</tr>
<tr>
<td>Tobacco chewing</td>
<td>9 (3.8)</td>
<td>9 (3.8)</td>
<td>1.0</td>
<td>1</td>
</tr>
<tr>
<td>Drug addiction</td>
<td>11 (4.6)</td>
<td>7 (2.9)</td>
<td>0.89</td>
<td>.346</td>
</tr>
<tr>
<td>Lack of food</td>
<td>1 (0.4)</td>
<td>14 (5.8)</td>
<td>11.27</td>
<td>.001</td>
</tr>
<tr>
<td>Air pollution</td>
<td>7 (2.0)</td>
<td>5 (2.1)</td>
<td>0.33</td>
<td>.563</td>
</tr>
<tr>
<td>Sudden shock</td>
<td>2 (0.8)</td>
<td>8 (3.3)</td>
<td>3.6</td>
<td>.058</td>
</tr>
<tr>
<td>Genetic factors</td>
<td>9 (3.8)</td>
<td>0 (0.0)</td>
<td>9.0</td>
<td>.003</td>
</tr>
<tr>
<td>Other</td>
<td>20 (18.1)</td>
<td>30 (10.4)</td>
<td>1.91</td>
<td>.166</td>
</tr>
</tbody>
</table>

\(^a\) Percentages were estimated within socioeconomic status.
\(^b\) \(p\) values were estimated comparing the percentages of HSES and LSES columns using goodness of fit chi-square test with \(df = 1\) and significance was set at \(.0023\) with a Bonferroni adjustment.

On the other hand, more than 50% of HSES participants identified behavioural risk factors such as unhealthy diet, physical inactivity, and smoking as well as mental stress. However, among the HSES participants less than 50% identified the physiological risk factors of CHD such as high cholesterol and hypertension, and less than 20% identified
obesity and diabetes. A low response was also seen for nonmodifiable risk factors of CHD in both groups.

The percentage of participants who listed a higher number of risk factors was greater in the HSES group. Refer to Figure 4.2. Nearly one third (32.1%) of the participants from the LSES group were unable to identify a single risk factor for CHD, and the same percentage was able to name only one risk factor. However, more than one quarter (26.9%) of the HSES participants identified at least three risk factors and almost one quarter identified at least four. To achieve a good score concerning CHD risk factors, participants were required to identify at least eight CHD risk factors, and only about 3% of HSES participants were able to do that.

![Figure 4.2. Number of risk factors identified by both SES groups.](image)

Some factors were listed as CHD risk factors by the participants but are not considered among the World Health Organization 13 traditional risk factors mentioned in Chapter 1. However, they may have a relation with CHD. For example, work stress, food adulteration,* drug addiction, air pollution, and infection were mentioned as CHD risk factors, and around 30% of participants from both group mentioned these factors. The maximum number of these factors was four. The purpose of adding these findings

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* In Bangladesh, food is adulterated in a number of ways. These include using harmful chemicals such as the pesticide formalin and toxic colours to make the food appear fresh and attractive. Some vendors store and sell putrid perishables. The manufacturers also mix toxic substances such as husk in different spices and edible oils (Solaiman & Ali, 2014).
here is that those factors are important in the context of Bangladesh. The other risk factors shown in Table 4.6 are related to diet, stress, and comorbidity. Most, such as excess tea consumption, were incorrect. A few participants reported some anomalies as risk factors for CHD, including fate, having too much sexual intercourse, having an affair with someone, and too much travelling.

### 4.4.4.2 How risk factors lead to CHD

The participants who identified at least one traditional modifiable or nonmodifiable risk factor out of 13 were asked to describe how this risk factor leads to CHD. They were asked to provide explanations about only those risk factors they listed in Question 6. The responses were placed in three different categories comprising “explained appropriately”, “explained inappropriately”, and “do not know”. Among the HSES participants, the five risk factors that were identified most appropriately were cholesterol (95.5%), unhealthy diet (91%), physical inactivity (76.4%), obesity (65.9%), and smoking (48.4%). Refer to Figure 4.3.

In the HSES, the main inappropriate explanations were for smoking (19%), obesity (15.9%), diabetes (14.6%), genetic causes (11.1%), and mental stress (10.4%). The “Do not know” response was higher for eight risk factors including tobacco chewing (100%), family history (96.6%), genetic causes (77.8%), alcohol consumption (71.2%), diabetes (70%), hypertension (69%), age (58.8%), and mental stress (55.6%).

Once again, the responses reflected a major lack of knowledge among LSES participants. Figure 4.4 reveals that none of them mentioned genetic factors as a risk factor and the “Do not know” response was very high for the remaining 11 risk factors apart from high cholesterol.

After high cholesterol, the appropriate responses were comparatively higher for physical inactivity (44.4%), obesity (25%), and unhealthy diet (22.5%) in the LSES group. The inappropriate responses were higher for alcohol (22.2%), diabetes (20%), and smoking (18.8%). Participants’ inappropriate explanations were quite interesting. Tables 4.7 and 4.8 contain examples of appropriate and inappropriate explanations offered by participants concerning how risk factors lead to CHD.
Figure 4.3. How risk factors lead to CHD according to HSES participants.

Figure 4.4. How risk factors lead to CHD according to LSES participants.
Table 4.7

*Examples of Appropriate Explanations Concerning How Risk Factors Lead to CHD*

<table>
<thead>
<tr>
<th>Participant’s code number</th>
<th>Relevant risk factor</th>
<th>Quotation/explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSES54</td>
<td>High cholesterol</td>
<td>Because of high cholesterol, the internal space of artery becomes narrow which leads to decreased blood circulation and that is HD</td>
</tr>
<tr>
<td>HSES55</td>
<td>Physical inactivity</td>
<td>Because of sedentary lifestyle the fat in the body does not burn which leads to CHD</td>
</tr>
<tr>
<td>HSES163</td>
<td>Smoking</td>
<td>Smoking increases blood pressure which causes CHD</td>
</tr>
<tr>
<td>LSES261</td>
<td>Unhealthy diet</td>
<td>Unhealthy diet is responsible for high blood pressure and thus heart disease occurs</td>
</tr>
</tbody>
</table>

Table 4.8

*Examples of Inappropriate Explanations Concerning How Risk Factors Lead to CHD*

<table>
<thead>
<tr>
<th>Participant’s code number</th>
<th>Relevant risk factor</th>
<th>Quotation/explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSES152</td>
<td>Diabetes</td>
<td>Diabetes is an internal cancer ... if the glucose level fluctuates, people may have stroke any time and that leads to heart disease.</td>
</tr>
<tr>
<td>HSES152</td>
<td>Smoking</td>
<td>Smoking affects lung, people also may have gastric problem because of smoking and that leads to heart disease.</td>
</tr>
<tr>
<td>HSES168</td>
<td>Smoking</td>
<td>Smoking causes lung problem, and that causes heart problem.</td>
</tr>
<tr>
<td>LSES119</td>
<td>Alcohol consumption</td>
<td>Excessive alcohol consumption leads to pain in kidney; the pain of kidney affects kidney and lungs which leads to heart disease.</td>
</tr>
<tr>
<td>LSES71</td>
<td>Unhealthy diet</td>
<td>Unhealthy diet leads to gastric ulcer which causes weakness, and because of this weakness heart disease occurs.</td>
</tr>
</tbody>
</table>

Because the majority of appropriate explanations were provided by HSES participants, most of the quotations in Table 4.7 are from those people. However, some of the explanations are surprising, especially from among HSES participants, reflecting their lack of basic knowledge about human anatomy. For example, HSES152 considered diabetes to be an “internal cancer” and she also said that smoking leads to “gastric problems” and they in turn cause heart disease. She was possibly confusing
chest burn due to gastrointestinal problems with chest pain caused by heart disease. To
describe the effect of alcohol consumption on the heart, LSES119 said alcohol led to
kidney pain and that pain affected the lung [sic] and that in turn led to CHD, indicating
he was moving one body part to another without any link.

4.4.4.3 Single most preventable risk factor

In response to the question about the single most preventable risk factor for CHD,
almost twice the percentage of HSES participants relative to the LSES participants
identified the correct answer, namely smoking. However, the proportion within the
HSES was only 18.1%. The most frequent reply to this single-response question among
HSES participants was unhealthy diet (38.2%), but among LSES participants it was
mental stress (27.9%). More than one third of LSES participants said that they did not
know the answer. The list of responses is provided in Table D.3 in Appendix D.

4.4.5 Knowledge about symptoms of heart attack

As with the question about CHD risk factors, in response to the question about
symptoms of CHD a variety of symptoms were mentioned by the participants. In order
to avoid Type I errors when comparing the two SES groups, statistical significance was
set at .0031 with a Bonferroni adjustment. The majority of the participants were able to
recognise chest pain, the most common symptom of heart attack. As can be seen in
Table 4.9, the most common heart attack symptom identified in both groups was chest
pain.

Apart from chest pain, less than 30% of participants in both groups knew about
breathlessness and sweating, and less than 10% of participants knew about dizziness,
vomiting/nausea, radiated arm pain, and upper body discomfort. Tiredness was
mentioned by only five participants of 478.

A greater percentage of HSES participants mentioned sweating, vomiting, and
radiated arm pain as symptoms of CHD. Some incorrect symptoms that the participants
mentioned were the tongue and eyes protruding, vein rupture, a need to put something
in the mouth, and vascular pain.
### Table 4.9

Symptoms of Heart Attack Identified by Participants

<table>
<thead>
<tr>
<th>Categories</th>
<th>HSES (%) a</th>
<th>LSES (%) a</th>
<th>$\chi^2$</th>
<th>$p^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest pain</td>
<td>187 (78.6)</td>
<td>157 (65.4)</td>
<td>2.87</td>
<td>.090</td>
</tr>
<tr>
<td>Breathlessness</td>
<td>63 (26.5)</td>
<td>67 (27.9)</td>
<td>0.09</td>
<td>.766</td>
</tr>
<tr>
<td>Fainting</td>
<td>63 (26.5)</td>
<td>53 (22.1)</td>
<td>0.93</td>
<td>.334</td>
</tr>
<tr>
<td>Sweating</td>
<td>88 (37.0)</td>
<td>10 (4.2)</td>
<td>62.72</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Chest discomfort</td>
<td>29 (12.2)</td>
<td>42 (17.5)</td>
<td>2.31</td>
<td>.128</td>
</tr>
<tr>
<td>Palpitation</td>
<td>16 (6.7)</td>
<td>31 (12.9)</td>
<td>4.66</td>
<td>.031</td>
</tr>
<tr>
<td>Dizziness</td>
<td>25 (10.5)</td>
<td>19 (7.9)</td>
<td>0.87</td>
<td>.349</td>
</tr>
<tr>
<td>Inability to speak</td>
<td>18 (7.6)</td>
<td>18 (7.5)</td>
<td>0.001</td>
<td>.973</td>
</tr>
<tr>
<td>Vomiting/nausea</td>
<td>24 (10.1)</td>
<td>4 (1.7)</td>
<td>14.57</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Weakness</td>
<td>7 (2.9)</td>
<td>19 (7.9)</td>
<td>5.36</td>
<td>.021</td>
</tr>
<tr>
<td>Inability to move or work</td>
<td>10 (4.2)</td>
<td>13 (5.4)</td>
<td>0.39</td>
<td>.532</td>
</tr>
<tr>
<td>Sudden death</td>
<td>6 (2.5)</td>
<td>13 (7.1)</td>
<td>5.26</td>
<td>.022</td>
</tr>
<tr>
<td>Radiated left arm pain</td>
<td>18 (7.6)</td>
<td>0 (0.0)</td>
<td>18.0</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Upper body discomfort</td>
<td>12 (5.0)</td>
<td>6 (2.5)</td>
<td>2.0</td>
<td>.157</td>
</tr>
<tr>
<td>(neck pain / headache / shoulder pain / spinal pain / stomach ache mentioned as a symptom)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High blood pressure</td>
<td>9 (3.8)</td>
<td>5 (2.1)</td>
<td>1.14</td>
<td>.285</td>
</tr>
<tr>
<td>Other</td>
<td>43 (18.1)</td>
<td>25 (10.4)</td>
<td>4.87</td>
<td>.027</td>
</tr>
</tbody>
</table>

---

| a Percentages were estimated within socioeconomic status.  
| b $p$ values were estimated comparing the percentages of HSES and LSES columns using goodness of fit chi-square test with $df = 1$.  

The maximum number of symptoms listed by participants from both socioeconomic groups was five. Around a quarter of the participants from both groups reported at least one symptom and about 30% of participants listed at least two. However, about 30% of the HSES participants identified three symptoms, which was nearly double that identified by LSES participants. Approximately 20% of the LSES participants did not know any heart attack symptoms. The corresponding percentage among the HSES participants was very low (1.3%).
Nearly all participants in the HSES group and three quarters of LSES participants thought a person could have CHD and not be aware of it. Among the LSES participants, less than 10% knew that CHD symptoms could be undetectable.

4.4.6 Knowledge about prevention and treatment of CHD

Information concerning the participants’ knowledge about the prevention and treatment of CHD is provided in Table 4.10 and described within Sections 4.4.6.1 and 4.4.6.2.

4.4.6.1 Knowledge about prevention of CHD

Approximately 93% of HSES participants and more than 60% of LSES participants believed that CHD is preventable. Refer to Table 4.10. Less than one fifth (16.7%) of LSES participants did not know whether or not CHD is preventable, and of the remainder about 20% indicated they believed that CHD could not be prevented.

In response to a follow-up question about prevention of CHD, almost 90% of the HSES participants thought that CHD could be prevented by controlling or avoiding risk factors. In contrast, in the LSES group approximately only one third of the participants held similar beliefs. Approximately a quarter of LSES participants who thought CHD could be prevented used the term “doctor’s advice” as a preventive measure, but when they were asked what they meant by saying that it appeared that they did not know what “doctor’s advice” was. Interesting ways of prevention offered by four LSES participants were having money, seeking advice from a traditional healer, government initiatives, and knowledge about medicine.

Participants who said they thought that CHD could not be prevented were asked why they thought that, and their responses differed between the two socioeconomic groups. About half of the participants (53.1%) in the LSES group were not able to offer a reason, and that was twice as high as in the HSES. Around one fifth of LSES participants thought that there was nothing that could be done, it happened automatically, and another fifth believed it depended on Allah/fate. In contrast, approximately half of the HSES participants who thought that CHD could not be prevented believed that it could nevertheless be controlled (Table D.4 in Appendix D).
Table 4.10  
Participants’ Knowledge About CHD Prevention and Treatment

<table>
<thead>
<tr>
<th>Categories</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>$\chi^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD prevention</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventability of CHD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>221 (92.9)</td>
<td>151 (62.9)</td>
<td>64.45</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>No</td>
<td>14 (5.9)</td>
<td>49 (20.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not know</td>
<td>3 (1.3)</td>
<td>40 (16.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Means of prevention</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control or avoid risk factors</td>
<td>195 (88.2)</td>
<td>54 (35.8)</td>
<td>80.98</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Regular check-up</td>
<td>25 (11.3)</td>
<td>30 (19.9)</td>
<td>0.41</td>
<td>.517</td>
</tr>
<tr>
<td>Treatment</td>
<td>11 (5.0)</td>
<td>32 (21.2)</td>
<td>10.06</td>
<td>.002</td>
</tr>
<tr>
<td>Do not know</td>
<td>5 (2.3)</td>
<td>18 (11.9)</td>
<td>7.35</td>
<td>.007</td>
</tr>
<tr>
<td>CHD treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is CHD treatable?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>237 (99.6)</td>
<td>228 (95.0)</td>
<td>9.57</td>
<td>.008</td>
</tr>
<tr>
<td>No</td>
<td>0 (0.0)</td>
<td>3 (1.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not know</td>
<td>1 (0.4)</td>
<td>9 (3.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method of treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicine</td>
<td>159 (67.1)</td>
<td>158 (69.3)</td>
<td>0.02</td>
<td>.892</td>
</tr>
<tr>
<td>Surgery</td>
<td>151 (63.7)</td>
<td>21 (9.2)</td>
<td>99.47</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Lifestyle modification</td>
<td>90 (38.0)</td>
<td>34 (14.9)</td>
<td>25.84</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Do not know</td>
<td>4 (1.7)</td>
<td>40 (17.5)</td>
<td>29.13</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

* Percentages were estimated within each socioeconomic status.
* Chi-square tests are appropriate only when all expected cell counts exceed 5.
* For single response questions, $p$ values were estimated using Pearson’s chi-square test.
* For multiple response questions, $p$ values were estimated comparing the percentages of HSES and LSES columns using goodness of fit chi square test with $df = 1$.

4.4.6.2 Knowledge about treatment of CHD

Almost all (99.6%) of HSES participants and 95% of those in the LSES group thought that CHD was treatable. In their replies to a follow-up question about treatment options, nearly 70% of both groups mentioned medication. However, apart from medication the remaining responses differed notably between the two socioeconomic groups (Table 4.10). Other responses in the LSES group were massage, Aayurvedic treatment, one’s
own knowledge, and people who can afford to go abroad, and among HSES participants it was provision of oxygen, regular check-ups, and praying to the Almighty.

### 4.5 Awareness about CHD

#### 4.5.1 The CHD awareness score

As with the overall knowledge score about CHD, participants of both groups showed a lack of awareness about CHD. However, HSES participants demonstrated a greater awareness about CHD with a mean ± SD awareness score of 9.50 ± 3.1, which was significantly higher than the LSES participants’ score of 6.06 ± 2.6, \( t (476) = 13.22, p < .001, 95\% \text{ CI} \ [2.928, 3.951] \). The overall mean ± SD awareness score of participants was 7.77 ± 3.3. Only around 18% of HSES participants had a good level of awareness about CHD, but that was noticeably higher than the 1.7% of LSES participants with a good level of awareness. Almost half of the HSES participants were categorised as having neither a poor nor a good level of awareness. In contrast, about 60% of the LSES participants had a poor level of CHD awareness. Refer to Figure 4.5.

![Levels of awareness about CHD for the two socioeconomic groups.](image)

Information about most of the components relevant to the total awareness score is provided in Table 4.11 and described within Sections 4.5.2 to 4.5.5. Information about the participants’ awareness of what they would do in the event of a heart attack, which also contributed to the total awareness score, is provided within Section 4.5.6.
Table 4.11

*Participants’ Awareness About CHD*

<table>
<thead>
<tr>
<th>Category</th>
<th>HSES (%) a</th>
<th>LSES (%) a</th>
<th>$\chi^2$ b</th>
<th>p c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness about own risk factors (RF) related to CHD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware of having own RF</td>
<td>147 (61.8)</td>
<td>61 (25.4)</td>
<td>64.69</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Aware of not having own RF</td>
<td>0 (0.0)</td>
<td>1 (0.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unaware of having own RF</td>
<td>91 (38.2)</td>
<td>178 (74.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness about taking preventive action to avoid CHD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware</td>
<td>136 (57.1)</td>
<td>25 (10.4)</td>
<td>114.72</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Unaware</td>
<td>102 (42.9)</td>
<td>215 (89.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness about having medical conditions related to CHD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware of having medical condition</td>
<td>66 (27.7)</td>
<td>20 (8.3)</td>
<td>39.50</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Aware of not having medical condition</td>
<td>120 (50.4)</td>
<td>182 (75.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unaware of having medical condition</td>
<td>52 (21.8)</td>
<td>38 (15.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness about pre-diagnosed CHD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware of having prediagnosed CHD</td>
<td>13 (5.5)</td>
<td>12 (5.0)</td>
<td>0.000</td>
<td>.983</td>
</tr>
<tr>
<td>Aware of not having prediagnosed CHD</td>
<td>225 (94.5)</td>
<td>228 (95.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness about having family history of CHD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware of having</td>
<td>91 (38.2)</td>
<td>44 (18.3)</td>
<td>44.36</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Aware of not having</td>
<td>139 (58.4)</td>
<td>149 (62.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unaware of having</td>
<td>8 (3.4)</td>
<td>47 (19.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness on known person with CHD in the community</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aware of having</td>
<td>187 (78.6)</td>
<td>60 (25.0)</td>
<td>139.15</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Aware of not having</td>
<td>23 (9.7)</td>
<td>59 (24.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unaware of having</td>
<td>28 (11.8)</td>
<td>121 (50.4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a Percentages were estimated within each socioeconomic status.
b Chi-square tests are appropriate only when all expected cell counts exceed 5.
c $p$ values were estimated using Pearson’s chi-square test.
4.5.2 Awareness about one’s own risk factors

The percentage of awareness about having a CHD risk factor was approximately 2.5 times higher among the HSES than among the LSES participants, reflecting a lack of awareness of one’s own risk factors in LSES participants. Refer to Table 4.11. Apart from a single participant in the LSES group, all of the participants who believed that they did not have any risk factors for CHD actually did have risk factors such as smoking, physical inactivity, or an unhealthy diet. This result was obtained when the responses were compared with lifestyle practices and the physiological status of the participants.

Participants who were aware of having one or more risk factors were asked to list these in a follow-up question. The most common self-reported risk factor was mental stress in both groups, although the percentage of those in the LSES group was about twice as high as that in the HSES group and reached almost 60% of participants in the LSES group (see Table D.6 in Appendix D).

More than 65% of HSES participants, in contrast to around 25% of LSES participants, reported at least one personal risk factor that they were aware of. Although 3.4% of participants were aware of their own risk factor(s), they were unable to identify any traditional risk factor(s), and among them 9.8% were from the LSES group while 0.7% were from the HSES group. The maximum number of traditional risk factors affecting the participants and identified by the participants from the LSES group was five, and in the HSES group it was four.

4.5.3 Awareness about taking preventive action concerning CHD

As with their lack of awareness about their own CHD risk factors, participants from the LSES demonstrated a lack of awareness about taking preventive action for CHD. Refer to Table 4.11. Almost 90% of LSES participants did not take any preventive action to avoid CHD, and that percentage was more than double that among HSES participants. The participants who indicated that they took preventive action were asked about the steps they had taken to do so. Among the HSES participants, 72.3%, and among LSES participants, 60% stated that they were leading a healthy lifestyle as a preventive measure (see Table D.7 in Appendix D). There was no significant difference in the pattern of preventive actions taken by the two groups. Some of the actions taken by the
participants were unusual. They included Accu pressure, herbal and home remedies, and avoiding crowded environments.

Participants who took preventive action to avoid CHD were asked their reasons for doing so. The results are presented in Table D.8 in Appendix D. Many HSES participants (36.8%) and LSES participants (40%) reported that they took action for their overall health or to be healthy. Less than 15% of HSES participants stated that they already had chronic diseases such as CHD, HTN, diabetes, high cholesterol, or stroke, and 10.3% mentioned avoiding chronic disease as a reason. The same percentage of LSES participants wanted to avoid chronic diseases (8%), had health problems such as chest pain (8%), and heard or understood that the factors such as tobacco, alcohol, or an unhealthy diet lead to heart disease or are harmful for health. A variety of interesting responses to this question are provided in Section 4.8.

Participants discussed a range of reasons for not taking any preventive action to avoid CHD. More than 40% in the HSES group and around one quarter of LSES participants (23.7%) who had not taken any preventive action to avoid CHD stated that they did not have CHD or any cardiac problem or they were healthy as the reason for not taking preventive action (see Table D.9 in Appendix D). In contrast, almost an equal percentage in both groups did not provide any reason for taking preventive action. However, some of the reasons such as lack of money, lack of knowledge about preventive actions, personal neglect, and not knowing the reasons differed between the two groups. Other causes were related to sociocultural and religious considerations, personal choices, and lack of health access.

Of the HSES participants who did not take any preventive action, fewer than half (44.1%) thought they might have CHD or a previous heart attack, and the percentage was more than twice as high ($p < .001$) among LSES participants (see Table D.10 in Appendix D). In contrast, more than one quarter of the LSES participants were not aware of the consequences of not taking any preventive action. This was substantially higher in the LSES than in the HSES group (27.0% versus 15.7 %). Among the HSES participants, the percentages were 15.7% and 18.6%, respectively. Some financial, religious, and psychological issues were provided as consequences.
4.5.4 Awareness about prediagnosed CHD and medical conditions related to CHD

The awareness about prediagnosed CHD and medical conditions related to CHD, for example, HTN, diabetes, or high cholesterol, referred to whether participants had been informed by medical practitioners about their own, and therefore clinically diagnosed, CHD and medical conditions related to CHD. Overall, the percentage of participants who had been prediagnosed with medical conditions related to CHD was less than 30%. The percentage was about three times higher in the HSES group relative to the LSES group. However, the lack of awareness about having any medical condition did not differ significantly between these groups (Table 4.11). This result was analysed by verifying participants’ physiological status.

The proportion of participants who were aware of their prediagnosed CHD was almost the same (about 5%) in the two socioeconomic groups. The answers to the question about awareness about prediagnosed CHD could not be verified as no diagnostic procedure for CHD was employed in this study.

4.5.5 Awareness about having a family history of CHD

Awareness about having a family history associated with CHD referred to whether the participants had been informed about any person among their first degree relatives (father, mother, or sibling, but not a nonblood relative such as a wife or husband) having CHD. Nearly three fifths of the participants in both of the socioeconomic groups were aware of not having any family history of CHD. However, the proportion of awareness and lack of awareness about having a family history in these groups differed substantially (Table 4.11).

4.5.6 Knowing a person in the community with CHD

Awareness in terms of knowing a person with CHD in the community was common for HSES participants (80%). This was more than three times higher than among the LSES participants. Approximately half of the LSES participants were unaware of having a person with CHD in their community, and once more the percentage of these was almost five times higher than among HSES participants (Table 4.11).
4.5.7  Awareness about taking action in the event of a heart attack

Information concerning the participants’ awareness about taking action in the event of a heart attack is provided in Table 4.12 and described within Sections 4.5.7.1 and 4.5.7.2.

Table 4.12

*Participants’ Awareness About Action to be Taken in the Event of a Heart Attack*

<table>
<thead>
<tr>
<th>Category</th>
<th>HSES (%) ^a</th>
<th>LSES (%) ^a</th>
<th>$\chi^2$</th>
<th>$p$ ^b</th>
</tr>
</thead>
<tbody>
<tr>
<td>One’s own heart attack event</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seek help from medical service</td>
<td>204 (85.7)</td>
<td>204 (85.0)</td>
<td>0.002</td>
<td>.960</td>
</tr>
<tr>
<td>Other than medical service</td>
<td>53 (22.3)</td>
<td>40 (16.9)</td>
<td>1.81</td>
<td>.178</td>
</tr>
<tr>
<td>Do not know</td>
<td>2 (0.8)</td>
<td>11 (4.6)</td>
<td>5.95</td>
<td>.015</td>
</tr>
<tr>
<td>Another’s heart attack event</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seek help from medical service</td>
<td>204 (92.0)</td>
<td>211 (87.9)</td>
<td>0.12</td>
<td>.731</td>
</tr>
<tr>
<td>Other than medical service</td>
<td>49 (20.4)</td>
<td>33 (13.6)</td>
<td>3.12</td>
<td>.077</td>
</tr>
<tr>
<td>Do not know</td>
<td>0 (0.0)</td>
<td>10 (4.2)</td>
<td>10.0</td>
<td>.002</td>
</tr>
</tbody>
</table>

^a Percentages were estimated within socioeconomic status.

^b $p$ values were estimated comparing the percentages of HSES and LSES columns using goodness of fit chi-square test with $df = 1$.

4.5.7.1  One’s own heart attack

Participants were asked about the first thing they would do if they experienced signs of a heart attack. Approximately 85% of participants thought they would seek medical attention as quickly as possible or within an hour, with the proportion almost equal in HSES and LSES groups. Refer to Table 4.12. Seeking medical attention consisted of going to the doctor, seeking admission to a hospital, or asking someone to take the participant to hospital. A significantly higher proportion of LSES participants did not know what to do. The remaining responses were considered to be unrelated to seeking medical services and were bemusing. They included drinking tamarind juice with salt, eating a raw egg, putting a mixture of water and oil on the head, and the situation depending on Allah because of lack of money (see Table D.13 in Appendix D).
As expected, none of the participants in either socioeconomic group mentioned that they would call an emergency number because there is no centralised system for accessing ambulance services in Bangladesh (WHO, 2014).

4.5.7.2 Another’s heart attack

The responses to the question about what a participant would do in the event of another’s heart attack were similar to the replies provided to the previous question about awareness concerning action to take in the event of one’s own heart attack (Table D.14 in Appendix D). When asked what they would do if someone else was experiencing signs of a heart attack, approximately 90% in both SES groups thought they would seek help from a medical service (Table 4.12). Again, seeking medical help included taking, or trying to take, the person to the doctor, admitting them to a hospital, or immediately calling an ambulance.

4.5.8 Participants’ concerns about their own heart health

Entries in Table 4.11 demonstrate that more than half of the participants were not concerned about their heart health, with 60% from the LSES group and 50.4% from the HSES group not being concerned. Participants who were concerned about their heart health were asked what they were specifically concerned about. Approximately 80% of LSES participants who were concerned about experiencing CHD symptoms referred to chest pain, breathing problems, sweating, palpitation, dizziness, or weakness at work, which was 2.5 times higher than among HSES (31.4%) members. In contrast, more than one third of HSES participants were concerned about having a CHD risk factor or they were not leading a heart-healthy lifestyle. This was five times higher than among LSES participants (Table D.11 in Appendix D).

Among those who were not concerned about their heart health, 84.8% of LSES participants and 70% of HSES participants said that they were healthy or that they did not have the disease or any problem as the reasons for not being concerned. They also made some interesting comments in response to this question. These are listed in Table D.12 in Appendix D.
4.6  Lifestyle practices

4.6.1  The lifestyle practices score

Although the participants’ level of knowledge and awareness were not high, a relatively high percentage of participants in both LSES (50.4%) and HSES (57.1%) groups had good lifestyle practice scores. See Figure 4.6.

![Figure 4.6. Levels of lifestyle practices for the two socioeconomic groups.](image)

The overall mean ± SD of lifestyle practice score of all participants was 3.58 ± 0.62. Very few participants from either group had a poor level of lifestyle practices (HSES 0.4% versus LSES 1.2%), and only 0.4% of the LSES participants and none of the HSES participants had very poor lifestyle practices. There was no significant difference between lifestyle scores of HSES (3.63 ± 0.55) and LSES (3.53 ± 0.68) participants, \( t(458.89) = 1.696, p = .090, 95\% \text{ CI } [-0.015, 0.207] \).

4.6.2  Tobacco

Results concerning tobacco smoking and chewing are summarised in Table 4.13 and described in greater detail in Sections 4.6.2.1 and 4.6.2.2 immediately below.
Table 4.13  
History of Tobacco Smoking and Chewing of Participants

| Characteristics       | HSES (%)  
|                       | LSES (%)  
|                       | $\chi^2$ | $p$  
| Smoker                | 45 (18.9)| 47 (19.6)| 12.00 | .002  
| Nonsmoker             | 167 (70.2)| 186 (77.5)|      |      
| Ex-smoker             | 26 (10.9)| 7 (2.9)  |      |      
| Tobacco chewing       |          |          |      |      
| Tobacco chewer        | 14 (5.9) | 44 (18.3)| 19.63 | < .001 
| Tobacco nonchewer     | 222 (94.1)| 192 (81.7)|      |      
| Tobacco ex-chewer     | 1 (0.4)  | 4 (1.7)  |      |      

*a* Percentages were estimated within each socioeconomic status.  
*b* Chi-square tests are appropriate only when all expected cell counts exceed 5.  
*c* $p$ values were estimated using Pearson’s chi-square test.

4.6.2.1 Tobacco smoking

Approximately the same percentage of smokers was identified in both SES groups. See Table 4.13. However, a significant difference was seen in smoking with respect to participants’ gender as none of the female participants of either group were current smokers or ex-smokers.

A significant difference was found in the mean ± SD duration of smoking among the current smokers between participants of the HSES group (18.98 ± 8.7 years) and LSES group (12.57 ± 7.4 years), $t (90) = 3.81$, $p < .001$. The maximum duration of smoking reported in the HSES group was 45 years whereas in the LSES group it was 30 years, with a minimum of 4 years and 1 year respectively. However, the mean ± SD number of cigarettes smoked per day for smokers in the HSES group (7.40 ± 6.1 cigarettes) did not differ in comparison to LSES smokers (7.11 ± 5.8 cigarettes), $t (90) = .237$, $p = .813$. The maximum number of cigarettes the HSES participants smoked per day was 25, while among LSES participants it was 40 cigarettes.

Nearly 70% of the LSES and 60% of the HSES smokers had smoked the same amount during the previous year. Likewise, the trend of participants who decreased (31.1% HSES and 25.5% LSES) and increased (8.9% HSES and 6.4% LSES) their
smoking status did not differ significantly between the two status groups. Participants who increased their smoking in the previous year stated mental stress, personal problems, and work stress as the main reasons for increased smoking. One of the participants did not have any reason for his increased smoking.

Approximately 15% of HSES smokers who decreased their smoking in the previous year cited health problems as a reason for reducing their smoking level. The same was the case for a proportionally greater (50%) number of LSES smokers. Approximately one third of the HSES participants decreased their smoking because of its harmful effect on health, which was half the proportion among the LSES smokers. Other reasons were to reduce the risk of having CHD, to quit smoking, self-awareness, being over 30 years of age, a doctor’s advice, not having enough time to smoke, and acquaintances’ advice.

Of the participants who had maintained the same level of smoking during the previous year, about 80% in both groups felt they were habituated to the existing level of smoking or they did not need to change the amount they smoked. About 10% of LSES participants and 3.7% of HSES participants attributed maintaining their level of smoking to mental stress. Other stated reasons were addiction, not being able to increase the intensity because of their workplace restrictions, and smoking becoming a habit. One participant thought he could not say “no” to friends.

For the mean ± SD duration of smoking among the ex-smokers, compared with LSES participants (5.71 ± 5.3 years), HSES ex-smokers had smoked for a significantly greater number of years (14.62 ± 10.2 years), $t (31) = 2.21, p = .035$. However, among the ex-smokers, the mean ± SD cigarettes per day they smoked did not significantly differ between the HSES (14.00 ± 10.2 cigarettes) and LSES participants (9.86 ± 9.2 cigarettes), $t (31) = .974, p = .337$.

A variety of reasons were provided for quitting smoking. These included self-awareness or for their own health (15.2%), health problems apart from CHD or HTN (15.2%), family or social pressure (15.2%), being diagnosed with CHD (9.1%) or hypertension (6.1%), and single responses that referred to stroke, a sudden decision by all friends not to smoke, religious considerations, the cost and bad smell, its injurious effect on health, and realisation after gaining knowledge about CHD.
4.6.2.2 Tobacco chewing

Tobacco chewing was higher among the LSES participants compared with the HSES participants. See Table 4.13. Although none of the female participants were smokers, they chewed tobacco more. Of the total female participants, 18.1% were tobacco chewers and 14.7% were from the LSES group. The mean ± SD duration of tobacco chewing among the HSES participants (11.43 ± 5.3 years) was not significantly different from that of LSES participants (9.20 ± 8.9 years), with a maximum duration among HSES participants of 20 years, while among LSES participants it was 33 years. The mean ± SD times of daily tobacco chewing also did not differ significantly between HSES participants (4.36 ± 1.7 times per day) and LSES participants (5.75 ± 4.9 times per day). The maximum number of times of chewing tobacco per day among HSES participants was eight with a minimum of two times, whereas among LSES participants the numbers were 20 times and one time per day, respectively.

The percentage of LSES participants maintaining the same level of chewing in the previous year was higher (81.8%) than among HSES (53.8%) participants. However, percentages among participants decreasing their chewing status did not differ between the two SES groups (HSES 23.1% versus LSES 15.9%). The percentage of HSES participants (23.1%) increasing their chewing status was 10 times greater than among LSES participants (2.3%).

As all of HSES participants were feeling good about tobacco chewing, they increased their tobacco chewing status in the previous year, and only one participant from the LSES groups who increased their chewing status felt addicted to it.

The reasons for decreasing tobacco chewing status in the previous year among HSES participants were experience of a heart attack and not feeling good. As reasons for decreasing chewing, tobacco chewers in the LSES group mentioned not feeling good, financial constraints, trying to stop consuming, gastrointestinal and dental problems, and its bad effect on health.

The reason given for maintaining the same amount of tobacco chewing in the previous year did not differ between the two socioeconomic groups. Approximately three quarters of participants of both groups maintained the same status of tobacco
chewing because the amount was satisfactory for them, and almost 15% mentioned addiction as a reason. Another reason was that they did not feel the necessity to change. Interestingly, one participant thought the amount was satisfactory for him, that it was not an addiction, and that he was able to give up at any time. Another participant in the HSES did not provide any reason.

The reasons for giving up tobacco chewing were inconvenience regarding availability, a doctor’s advice, feeling bad, and dizziness.

### 4.6.3 Alcohol consumption

Alcohol consumption is very low in Bangladesh, and that was reflected in the results. However, occasional drinking was reported by a substantially higher percentage of participants in the HSES group, although the number was very small in both groups.

More participants reported alcohol consumption in the LSES group. See Table 4.14. A single current alcohol consumer in the HSES group had consumed alcohol for 2 years, and the average duration of alcohol consumption in two participants of the LSES group was 6 years. None of the regular alcohol consumers had increased their alcohol consumption. One of the LSES participants decreased their alcohol consumption, and another maintained the same consumption status.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>$\chi^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol drinker</td>
<td>1 (0.4)</td>
<td>2 (0.8)</td>
<td>7.83</td>
<td>.050</td>
</tr>
<tr>
<td>Occasional drinker</td>
<td>9 (3.8)</td>
<td>1 (0.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol ex-drinker</td>
<td>1 (0.4)</td>
<td>3 (1.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol nondrinker</td>
<td>227 (95.4)</td>
<td>234 (97.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a Percentages were estimated within each socioeconomic status.

b Chi-square tests are appropriate only when all expected cell counts exceed 5.

c $p$ values were estimated using Pearson’s chi-square test.
Of four ex-drinkers, three were from the LSES group and one from the HSES group. The duration of alcohol consumption of that HSES ex-drinker was 5 years and the mean ± SD duration of three participants in LSES was 17.17 ± 26.7 years. The fatal effect of excessive drinking, religious adherence, and health problems were the reasons for giving up alcohol consumption. The HSES participant mentioned feeling bad as a reason for stopping drinking. Participants who decreased their drinking status provided work stress as a reason and one who maintained the same drinking status thought his level of consumption was not problematic.

4.6.4 Dietary habits

4.6.4.1 Fruit and vegetables

None of the participants from either group were vegetarians. Refer to Table 4.15. The number of serves of fruit consumed varied daily. Of the total participants, 50.2% consumed fruits weekly, 21.3% monthly, and 16.7% of participants consumed on fruit on a daily basis. Only one quarter of HSES participants consumed fruit on a daily basis, but that was four times higher than for LSES participants (Table 4.15).

The mean ± SD serves of fruit per day was almost equal in both socioeconomic groups. The minimum number of serves of fruits the participants of both groups consumed was one and the maximum for HSES was four and for LSES it was three. The mean ± SD serves of fruit consumed per week also did not differ between HSES participants (2.61 ± 1.0) and LSES participants (2.07 ± 0.9).

Nearly 70% of the participants consumed vegetables on daily basis, followed by 26.2% on a weekly and 0.2% on a monthly basis. Table 4.15 contains the percentage of participants who consumed vegetables on a daily basis. The percentage was significantly higher among HSES participants (87%) than among LSES participants (56.7%), although the mean ± SD serves of vegetable consumption was almost equal in the two groups (2.16 ± 1.0 vs 2.03 ± 1.0). The minimum number of serves of vegetables among both groups was one and the maximum among HSES participants was six and among LSES participants it was seven. Almost 95% of participants in both groups did not consume ≥ 5 serves of fruit and vegetables per day, which was a sign of poor dietary practice.
Table 4.15

*Dietary Pattern of Participants*

<table>
<thead>
<tr>
<th>Category</th>
<th>HSES (%) (^a)</th>
<th>LSES (%) (^a)</th>
<th>(\chi^2) (^b)</th>
<th>(p) (^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruit and vegetables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants who consume fruits each day</td>
<td>65 (27.3)</td>
<td>15 (6.3)</td>
<td>31.25</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Mean ± SD serves of fruit per day</td>
<td>1.29 ± 0.6</td>
<td>1.33 ± 0.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants who consume vegetables each day</td>
<td>207 (87.0)</td>
<td>136 (56.7)</td>
<td>14.69</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Mean ± SD serves of vegetable per day</td>
<td>2.16 ± 1.0</td>
<td>2.03 ± 1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 5 serves of fruits and vegetable in a day</td>
<td>220 (92.4)</td>
<td>232 (96.7)</td>
<td>0.32</td>
<td>.572</td>
</tr>
<tr>
<td><strong>Fish / meat/ alternative and grains</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants consume fish / meat / alternative each day</td>
<td>235 (99.2)</td>
<td>177 (73.7)</td>
<td>8.16</td>
<td>.004</td>
</tr>
<tr>
<td>Mean ±SD serves of fish / meat/ alternative per day</td>
<td>2.09 ± 0.7</td>
<td>1.96 ± 0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD serves of grains per day</td>
<td>11.91 ± 3.5</td>
<td>12.08 ± 3.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Soft drinks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>163 (68.5)</td>
<td>153 (63.8)</td>
<td>0.99</td>
<td>.319</td>
</tr>
<tr>
<td>No</td>
<td>75 (31.5)</td>
<td>87 (36.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fast food</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>164 (68.9)</td>
<td>84 (35.0)</td>
<td>53.684</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>No</td>
<td>74 (31.1)</td>
<td>156 (65.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Extra salt in meals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>39 (16.4)</td>
<td>136 (56.7)</td>
<td>84.02</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>No</td>
<td>198 (83.2)</td>
<td>104 (43.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occasional</td>
<td>1 (0.4)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD glasses of water per day</td>
<td>9.67 ± 3.9</td>
<td>10.26 ± 5.0</td>
<td>0.60</td>
<td>.440</td>
</tr>
<tr>
<td><strong>Cooking oil</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soya bean</td>
<td>204 (85.7)</td>
<td>236 (98.3)</td>
<td>30.44</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Rice bran</td>
<td>20 (8.4)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>14 (5.9)</td>
<td>3 (1.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not know</td>
<td>0 (0.0)</td>
<td>1 (0.4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Percentages were estimated within each socioeconomic status.

\(^b\) Chi-square tests are appropriate only when all expected cell counts exceed 5.

\(^c\) For categorical variables \(p\) values were estimated using Pearson’s chi-square test. For continuous variables, \(t\)-tests were performed.
4.6.4.2 Grains and fish/meat/alternatives

No significant difference was found in the mean ± SD serves of grain between participants from the two socioeconomic strata (Table 4.15). The maximum serves of grains in both groups was 20 and the minimum was four serves per day.

A higher percentage of HSES participants were consuming fish, meat, or an alternative on a daily basis (Table 4.15). However, the mean ± SD serves were not significantly different. The minimum number of serves for both groups was one while the maximum number for HSES was six and for LSES it was seven. Just over 12 percent of all participants consumed fish, meat, or an alternative on a weekly basis and among them 96.7% were from the LSES and only 3.3% from the HSES.

4.6.4.3 Soft drinks and fast food

Almost equal percentages of HSES and LSES participants were soft drink consumers (Table 4.15). The serves of soft drink consumption were considered on a weekly and monthly basis. The mean ± SD serves of soft drinks per week drunk by the HSES participants (2.11 ± 1.9) and LSES participants (2.96 ± 2.15) did not differ significantly. The minimum number of serves consumed by both groups was one while the maximum in the HSES group was 14 and in the LSES group it was seven. On a monthly basis, the mean ± SD serves of soft drink consumption between the two socioeconomic groups also did not differ significantly.

Approximately 70% of HSES participants were fast food consumers, which was double that among LSES participants (Table 4.15). On the other hand, the mean ± SD serves of fast food consumption per week was higher among LSES participants (3.10 ± 2.4) than among HSES participants (1.84 ± 1.13), with a minimum of one and a maximum of seven serves weekly among both groups. The mean ± SD serves of fast food consumption per month was a little higher in the HSES group (1.80 ± 1.0) compared with the LSES group (1.27 ± 0.5).

4.6.4.4 Water intake, salt, and cooking oil

There was no significant difference between the mean ± SD glasses of water drunk by HSES and LSES participants (Table 4.15). The maximum number of glasses of drinking water in the HSES group was 20 with a minimum of three glasses, while the LSES
participants reported 35 and two glasses respectively. More than half of the LSES participants habitually took extra salt with their meals, which was 3.5 times higher than for participants in the HSES group.

More than 80% of HSES participants and almost all LSES participants used soya bean oil in their cooking as recommended in dietary guidelines in Bangladesh (Nahar et al., 2013). None of the LSES participants used rice bran oil, while 8.4% of HSES participants used that oil (Table 4.15). Very small numbers of HSES participants used mustard oil, sunflower oil, or vegetable oil.

### 4.6.5 Physical activity

Participants’ level of physical activity was assessed based on their physical activity at their work and apart from their work. See Table 4.16.

<table>
<thead>
<tr>
<th></th>
<th>HSES n(%)&lt;sup&gt;a&lt;/sup&gt;</th>
<th>LSES n(%)&lt;sup&gt;a&lt;/sup&gt;</th>
<th>(\chi^2)&lt;sup&gt;b&lt;/sup&gt;</th>
<th>(p)&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physically active at work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19 (8.0)</td>
<td>117 (48.8)</td>
<td>95.57</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>No</td>
<td>219 (92.0)</td>
<td>123 (51.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>apart from work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedentary</td>
<td>70 (29.4)</td>
<td>111 (46.2)</td>
<td>27.60</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Light</td>
<td>54 (22.7)</td>
<td>51 (21.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>76 (31.9)</td>
<td>69 (28.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strenuous</td>
<td>38 (16.0)</td>
<td>9 (3.8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Percentages were estimated within each socioeconomic status.

<sup>b</sup> Chi-square tests are appropriate only when all expected cell counts exceed 5.

<sup>c</sup> \(p\) values were estimated using Pearson’s chi-square test.

Almost half of the LSES participants were involved in physical activity at their work, which was five times higher than among HSES participants as the latter group primarily comprised office employees. Apart from work, nearly half (46.2%) of the LSES participants were sedentary, and more than double that within the HSES group (22.7%). In contrast, the percentage of participants in the HSES group who engaged in strenuous
activity apart from work was four times higher than in the LSES group—although the numbers were relatively small in both groups.

### 4.7 Associations between participants’ demographic characteristics, knowledge, awareness, and lifestyle practices

#### 4.7.1 Correlations among age, gender, knowledge, awareness, and lifestyle practices

Spearman’s rank-order correlation coefficients were used to determine whether any associations existed among demographic variables, CHD knowledge and awareness, and lifestyle practice in all participants. See Table 4.17. Entries in that table demonstrate that CHD knowledge and awareness were strongly correlated ($r_s = .601$, $p < .001$) among total participants. However, neither knowledge nor awareness was correlated with lifestyle practice among the combined study samples.

Table 4.17

<table>
<thead>
<tr>
<th>Variable</th>
<th>Age</th>
<th>Gender</th>
<th>Knowledge</th>
<th>Awareness</th>
<th>Lifestyle practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>$r$</td>
<td>1.00</td>
<td>-.171</td>
<td>.451</td>
<td>.282</td>
</tr>
<tr>
<td></td>
<td>$p$</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>$n$</td>
<td>478</td>
<td>478</td>
<td>478</td>
<td>478</td>
</tr>
<tr>
<td>Gender</td>
<td>$r$</td>
<td>1.00</td>
<td>-.188</td>
<td>-.255</td>
<td>.009</td>
</tr>
<tr>
<td></td>
<td>$p$</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td>.839</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$n$</td>
<td>478</td>
<td>478</td>
<td>478</td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>$r$</td>
<td>1.00</td>
<td>.601</td>
<td>.037</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$p$</td>
<td>&lt;.001</td>
<td>.423</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$n$</td>
<td>478</td>
<td>478</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness</td>
<td>$r$</td>
<td>1.00</td>
<td>.043</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$p$</td>
<td>.345</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$n$</td>
<td>478</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifestyle practices</td>
<td>$r$</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$p$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$n$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Entries for the both groups are shown above the shaded diagonal. All are Spearman’s rank order correlation coefficients.

Table 4.17 showed age was positively correlated with participants’ level of knowledge ($r_s = .451$, $p < .001$) and awareness ($r_s = .282$, $p < .001$) about CHD,
indicating that people who were older were more knowledgeable and aware about CHD. In contrast, lifestyle practice was negatively correlated with age, implying that people with lower age had better lifestyle practices. Another demographic variable gender was negatively correlated with knowledge and awareness about CHD. This implies that men showed a better CHD knowledge and awareness, as men were coded as 1 and women were coded as 2. On the other hand, there was no correlation between gender and lifestyle within the combined study samples.

Spearman’s rank-order correlation coefficients were also used to determine whether any associations existed among demographic variables, CHD knowledge and awareness, and lifestyle practice in the HSES and LSES groups separately. Table 4.18 indicates that there is a moderately positive association between CHD knowledge and awareness in both HSES, \( r_s = .380, p < .001 \) and LSES, \( r_s = .447, p < .001 \). However, the lifestyle practice score is neither associated with CHD knowledge nor with the CHD awareness in either of the socioeconomic groups.

Table 4.18

<p>| Correlations Among Age, Gender, Knowledge, Awareness, and Lifestyle Practices for Each SES Group |
|-----------------------------------------------|---------------|----------------|----------------|----------------|---------------|</p>
<table>
<thead>
<tr>
<th>Variable</th>
<th>Age</th>
<th>Gender</th>
<th>Knowledge</th>
<th>Awareness</th>
<th>Lifestyle practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.00</td>
<td>-.258</td>
<td>.127</td>
<td>.105</td>
<td>-.165</td>
</tr>
<tr>
<td>( p )</td>
<td>&lt; .001</td>
<td>.050</td>
<td>.106</td>
<td>.011</td>
<td></td>
</tr>
<tr>
<td>( n )</td>
<td>238</td>
<td>238</td>
<td>238</td>
<td>238</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.038</td>
<td>1.00</td>
<td>.041</td>
<td>-.129</td>
<td>.127</td>
</tr>
<tr>
<td>( p )</td>
<td>.554</td>
<td>.526</td>
<td>.047</td>
<td>.051</td>
<td></td>
</tr>
<tr>
<td>( n )</td>
<td>238</td>
<td>238</td>
<td>238</td>
<td>238</td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>.153</td>
<td>-.188</td>
<td>1.00</td>
<td>.380</td>
<td>.026</td>
</tr>
<tr>
<td>( p )</td>
<td>.018</td>
<td>.004</td>
<td>&lt; .001</td>
<td>.687</td>
<td></td>
</tr>
<tr>
<td>( n )</td>
<td>240</td>
<td>240</td>
<td>238</td>
<td>238</td>
<td></td>
</tr>
<tr>
<td>Awareness</td>
<td>-.021</td>
<td>-.246</td>
<td>.447</td>
<td>1.00</td>
<td>-.024</td>
</tr>
<tr>
<td>( p )</td>
<td>.744</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
<td>.717</td>
<td></td>
</tr>
<tr>
<td>( n )</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>238</td>
<td></td>
</tr>
<tr>
<td>Lifestyle practices</td>
<td>-.401</td>
<td>-.056</td>
<td>-.013</td>
<td>.052</td>
<td>1.00</td>
</tr>
<tr>
<td>( p )</td>
<td>&lt; .001</td>
<td>.390</td>
<td>.843</td>
<td>.424</td>
<td></td>
</tr>
<tr>
<td>( n )</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td></td>
</tr>
</tbody>
</table>

Note. Entries for the LSES group are shown below the shaded diagonal, and entries for the HSES participants are above the diagonal. All are Spearman’s rank order correlation coefficients.
As there was a significant difference between the mean ages of two groups and HSES had a lower number of female participants, it was interesting to see whether age and gender are correlated with knowledge, awareness, and lifestyle practice with respect to SES. Age is positively but weakly correlated with knowledge in both LSES ($r_s = .153, p = .018$) and HSES ($r_s = .127, p = .050$), indicating that older people have a better knowledge score in both SES groups, but it was not correlated with CHD awareness in either group. However, participants’ age is negatively correlated with lifestyle practice in both HSES and LSES groups, indicating that older people tended to have poorer lifestyle practices in both groups.

Gender is negatively but not strongly associated with knowledge in LSES, and in both groups with their CHD awareness score. As male participants were coded as 1 and females as 2, the negative correlation shows that male participants in the LSES group have better CHD knowledge and awareness compared with females, and HSES males also have better awareness.

### 4.7.2 Multiple regression analysis

Multiple regression analyses were used to determine whether knowledge and awareness can be predicted by SES, age, and gender, and also whether lifestyle practice can be predicted by SES, knowledge, awareness, age, and gender. According to the objectives of the study, SES is the main research focus, but age and gender have emerged as worthy of investigation because the data have shown a significant difference in age between the two socioeconomic strata, and gender in HSES. The extent to which SES predicted knowledge, awareness, and lifestyle was assessed by means of multiple regression analysis in conjunction with AIC.

#### 4.7.2.1 Predicting participants’ knowledge

The extent to which SES predicted knowledge was assessed by means of AIC in conjunction with standard (simultaneous) multiple regression. The analysis included generation of four models to determine whether it was necessary to include age and gender in assessing the relationship between SES and knowledge. The results are summarised in Table 4.19 in which the models are listed from strongest to weakest according to their predictive capacity based on the AIC value.
From the entries in Table 4.19, it can be seen that all four models attained statistical significance according to their $F$ values, and they all had an AIC $\Delta < 2$ relative to each other, indicating that, other considerations aside, they were indistinguishable in predictive power. According to Model 4, the most parsimonious solution, SES alone is able to predict a person’s knowledge, $t = 24.66, p < .001$ and was able to account for 56.00% of the variance in knowledge according to the adjusted $R^2$ value. However, given the AIC values and adjusted $R^2$ values, it appears to do so most effectively in conjunction with age and gender (Model 1).

Inspection of Model 1 revealed that gender was not a significant predictor within it, $t = 1.44, p = .151$, and inspection of Model 3 also revealed that gender was not a significant predictor, $t = 1.65, p = .099$. Therefore, Model 2 was inspected for its suitability. In that model, both SES and age were statistically significant predictors of knowledge, $t = 20.71, p < .001$ and $t = 2.14, p < .033$ respectively, so Model 2 was assessed as being the most satisfactory model. In it the adjusted $R^2$ value indicates that 56.33% of the variability in knowledge about CHD can be explained by a participant’s SES and age. As can be seen from entries in Table 4.20, the standardised coefficients (beta weights) indicate that SES was a considerably stronger predictor of knowledge than was age (|0.72| versus |0.07|, respectively).
Table 4.20

*Regression Summary Table for Knowledge Based on Results From Model 2*

<table>
<thead>
<tr>
<th>Model 2</th>
<th>Unstandardised coefficients</th>
<th>Standardised coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>Standard error</td>
</tr>
<tr>
<td>Constant</td>
<td>17.16</td>
<td>0.80</td>
</tr>
<tr>
<td>SES $^a$</td>
<td>-8.68</td>
<td>0.42</td>
</tr>
<tr>
<td>Age</td>
<td>0.04</td>
<td>0.19</td>
</tr>
</tbody>
</table>

$^a$ Negative coefficients are associated with low SES.

From the unstandardised regression coefficients in this model, which were $-8.68$ and $+0.04$ for SES and age, respectively (refer to Table 4.20), the higher a participant’s knowledge about CHD, the more likely that participant was to come from the HSES and to be older. Based on the intercept and unstandardised regression coefficients in Table 4.20, the regression equation can be characterised as follows:

\[
\text{Knowledge} = 17.16 - 8.68 \text{ if LSES } + 0.04 \text{ for each year of age}
\]

4.7.2.2 *Predicting participants’ awareness*

The extent to which SES predicted awareness was also assessed by means of AIC in conjunction with standard multiple regression. The analysis included generation of four models to determine whether it was necessary to include age and gender in assessing the relationship between SES and awareness. The results are summarised in Table 4.21 in which the models are listed from strongest to weakest according to their predictive capacity based on the AIC value.
Table 4.21

Models Predicting Awareness About CHD Based on SES, Age, and Gender

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictor variable(s)</th>
<th>AIC</th>
<th>Adjusted $R^2$</th>
<th>$F$ value</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SES, gender</td>
<td>985.41</td>
<td>.2930</td>
<td>99.84</td>
<td>2, 475</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>2</td>
<td>SES, age, gender</td>
<td>987.39</td>
<td>.2915</td>
<td>66.43</td>
<td>3, 474</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>3</td>
<td>SES, age</td>
<td>1003.45</td>
<td>.2658</td>
<td>87.34</td>
<td>2, 475</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>4</td>
<td>SES</td>
<td>1001.80</td>
<td>.2668</td>
<td>174.6</td>
<td>1, 476</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

From the entries in Table 4.21, it can be seen that all four models attained statistical significance according to their $F$ values, but only the first two models had an AIC $\Delta < 2$ relative to each other, and Models 3 and 4 had an AIC $\Delta > 10$ relative to Model 2, so the third and fourth models were not considered further. Within Model 1, SES and gender were both significant predictors of a person’s awareness, $t = 12.50$, $p < .001$ and $t = 4.32$, $p < .001$ respectively. Model 2 contained the additional variable of age, but it was not significant, $t = 0.15$, $p = .882$. Therefore, Model 1 was regarded as being the most satisfactory. The adjusted $R^2$ value in this model indicates that 29.30% of the variability in awareness can be explained by the participants’ SES and gender. Furthermore, the standardised regression coefficients (beta weights of $|−0.49|$ and $|0.17|$) indicate that SES is the stronger predictor of the two. Refer to Table 4.22.

Table 4.22

Regression Summary Table for Awareness Based on Results From Model 1

<table>
<thead>
<tr>
<th>Model 2</th>
<th>Unstandardised coefficients</th>
<th>Standardised coefficients</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$ Standard error</td>
<td>$\beta$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>8.67</td>
<td>-</td>
<td>32.84</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>SES $^a$</td>
<td>−3.24</td>
<td>−0.49</td>
<td>12.50</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Gender $^b$</td>
<td>1.16</td>
<td>0.17</td>
<td>4.32</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

$^a$ Negative coefficients are associated with low SES.

$^b$ Positive coefficients are associated with males.

From the unstandardised regression coefficients in this model (−3.24 and +1.16 for SES and gender, respectively), the higher a participant’s awareness about CHD, the
more likely that participant is to come from the HSES and to be a male. Based on the intercept and unstandardised regression coefficients, the regression equation can be characterised as follows:

\[ \text{Awareness} = 8.67 - 3.24 \text{ if LSES} + 1.16 \text{ if male} \]

### 4.7.2.3 Predicting participants’ lifestyle practices

Finally, the extent to which participants’ lifestyle practices could be predicted by their SES, knowledge, and awareness was also assessed by means of AIC in conjunction with standard multiple regression. The analysis included generation of 28 models to determine whether it was necessary include all three primary predictor variables, and also whether it was necessary to include age and gender as part of the process. The results for the four models that provided the strongest predictive outcomes are summarised in Table 4.23. These models are listed from strongest to weakest according to their predictive capacity based on the AIC values.

Table 4.23

*Models Predicting Lifestyle Practices Based on SES, Knowledge and Awareness About CHD, Age, and Gender*

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictor variables</th>
<th>AIC</th>
<th>Adjusted $R^2$</th>
<th>$F$ value</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SES, age</td>
<td>-509.57</td>
<td>.1078</td>
<td>29.82</td>
<td>2, 475</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>2</td>
<td>SES, age, gender</td>
<td>-508.14</td>
<td>.1070</td>
<td>20.05</td>
<td>3, 474</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>3</td>
<td>SES, knowledge, age</td>
<td>-508.12</td>
<td>.1070</td>
<td>20.04</td>
<td>3, 474</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>4</td>
<td>SES, awareness, age</td>
<td>-507.83</td>
<td>.1064</td>
<td>19.94</td>
<td>3, 474</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

From the entries in Table 4.23, it can be seen that all four models attained statistical significance according to their $F$ values, and all of these four strongest models had the AIC $\Delta < 2$ relative to each other, so were indistinguishable in predictive power. On the basis of AICs, the most effective means of predicting lifestyle practices is via participants’ SES and age (Model 1). In this model, both of these variables were
statistically significant predictors of lifestyle practices, \( t = 5.17, p < .001 \) and \( t = 7.51, p < .001 \) respectively. The adjusted \( R^2 \) value indicates that 10.78% of the variability in the participants’ lifestyle practices could be explained by SES and age.

In Model 2, the addition of gender was associated with only a small decrease in predictive power for lifestyle practices (down to 10.70%), but gender was not statistically significant, \( t = 0.76, p = .451 \), so that model was not given further consideration. In Model 3, the addition of knowledge to the variables in Model 1 was also associated with only a small decrease in predictive power for lifestyle practices (down to 10.70%), but knowledge was not statistically significant, \( t = 0.74, p = .459 \), so that model was also not given further consideration. In Model 4, the addition of awareness to the variables in Model 1 was also associated with only a small decrease in predictive power for lifestyle practices (down to 10.64%), but awareness was not statistically significant, \( t = 0.51, p = .611 \), so that model was not given further consideration. Furthermore, SES alone did not feature in any of the four strongest models, and there were 14 other models that carried greater explanatory power than it did as a single predictive variable. In the 15th model, it accounted for only 0.6% of the variance in lifestyle practices, \( t = 1.95, p = .052 \).

Therefore, Model 1 was assessed as being the most satisfactory. As can be seen from the standardised coefficients in Table 4.24, SES carried less predictive power than did age, with beta weights of \(|-0.03| \) and \(|0.37| \) respectively.

Table 4.24

\textit{Regression Summary Table for Lifestyle Practices Based on Results From Model 1}

<table>
<thead>
<tr>
<th>Model 2</th>
<th>Unstandardised coefficients</th>
<th>Standardised coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( B )</td>
<td>Standard error</td>
</tr>
<tr>
<td>Constant</td>
<td>4.45</td>
<td>0.11</td>
</tr>
<tr>
<td>SES(^a)</td>
<td>-0.32</td>
<td>0.06</td>
</tr>
<tr>
<td>Age</td>
<td>-0.02</td>
<td>0.00</td>
</tr>
</tbody>
</table>

\(^a\) Negative coefficients are associated with LSES.
In Model 1, from the unstandardised regression coefficients which were –0.32 and –0.02 for SES and age respectively, the poorer a participant’s lifestyle practices, the more likely that participant was to come from the LSES group and to be older. Conversely, the better a participant’s lifestyle practices, the more likely that participant was to come from the HSES group and to be younger. Based on the intercept and unstandardised regression coefficients, the regression equation can be characterised as follows:

\[
\text{Lifestyle practices} = 4.45 - 0.32 \times \text{if LSES} - 0.02 \times \text{for each year of age}
\]

4.8 Some interesting responses

Participants of this study provided some interesting responses in different parts of the questionnaire. Some of those responses are described below according to the subsections of the questionnaire.

4.8.1 Responses concerning demographic questions

In the demographic information section, some participants of the LSES did not have any idea of their age. For instance, LSES229 said that she was 18 years old. Considering her appearance, I asked her how long she had been married for and she replied she had been married for around 20 years. I estimated that she might be around 40 years old. Some other LSES participants were also not able to report their age and asked me to estimate their age. As a result, in those cases age was estimated.

4.8.2 Responses concerning knowledge questions

In the knowledge section of the questionnaire, participants were asked about their understanding of CHD. Among the LSES participants, some replied that they did not know anything about CHD. A number of LSES participants understood the English word *heart*, but they were not familiar with the corresponding Bengali word and some of them understood neither the English nor the Bengali word for heart. When the picture of a heart was drawn, two LSES participants (LSES208 and LSES332) said, “Oh, that’s
love”. Several attempts were used to assist them to understand. For example, they were asked, “Something is beating in your chest … What do you call it?” LSES116 used a Bengali term that means “liver” in English; LSES118 called it “only chest”. After that, the participants were asked, “What happens if this ‘liver’ or ‘love’ or ‘only chest’ is affected?” Some of them, including LSES113, were then able to say, “Chest pain or breathing problem or palpation or weakness”. Others, such as LSES100, did not know what the heart is or where it is located in the human body. To the same question, a participant from the LSES group answered, “Vein becomes hot after having CHD”. Another LSES participant said, “After having HD, it needs an oil massage in chest”, and another participant, HSES269, described CHD as “hole of heart”, although he also said “block of heart”. In a follow-up question about CHD treatment, the participants were asked about the way in which CHD can be treated. LSES208 replied, “Doctors treat. How would I know what sort of treatment they provide?”

4.8.3 Responses concerning awareness questions

4.8.3.1 Reasons for taking preventive action

A variety of reasons were provided for taking preventive action against CHD. A number of the reasons were not related to preventing CHD but more as participants’ personal choices. One participant, LSES117, explained “To be neat and clean, I avoid smoking and drugs”. He expanded on his statement by saying, “Because of smoking a bad smell comes out from my mouth, body and clothes ... smoking and drugs make the teeth dark that does not look good or clean”. He avoided smoking or drug addiction not to prevent CHD but to maintain his appearance. In a similar way, participant LSES93 maintained a healthy diet “to reduce body weight and to look good”. Similarly, HSES150 replied “I am obese from childhood, that’s why I am trying to lose some weight. I do not like overweight.”

Social reasons were offered by HSES155: “My husband has high cholesterol. That’s why I do not consume red meat and do not like it”. HSES453 and HSES163 replied, “To provide social support to my children”. LSES29 said, “I want to earn money by being healthy and that’s why I have taken this action”.


A religious explanation was also offered for taking preventive action. HSES359 said:

Islam tells to lead a healthy lifestyle such as avoiding any form of tobacco or alcohol consumption ... it tells us to consume less food, to pray 5 times that make us physically active. ... It tells us to lead a disciplined lifestyle, say for instance, go to bed earlier and wake up early in the morning. ... I am just following Islam and Prophet Muhammad (PBUH)!

4.8.3.2 Reasons for not taking preventive action

A variety of reasons were given by the participants for not taking any preventive action to avoid CHD. These reasons can be divided into three groups: sociocultural, personal choice, and religious. The sociocultural reasons can be illustrated by LSES51 who said, “Because of my husband’s carelessness I could not take any preventive action. He does not take me to the doctor”. Participant LSES71 said “I have several family problems. I cannot concentrate on everything”. And participant LSES75 said:

Lack of money, lack of medical access, I do not have time, I am confused about [whether] to seek treatment or go to work. … I am a poor person. If I seek treatment, I cannot spend my time on my job to earn money.

HSES281 responded, “Ha ha ha … In our country nobody takes preventive action unless he or she has the problem”.

Among the personal reasons, LSES89 replied, “I do not think it [taking preventive action] is important”. LSES62 said, “I do not think chest pain or weakness is a problem”, and LSES69 said, “I have several health problems, how many of them I would manage”. LSES184 said, “I do not care as I am a village person”.

Religious reasons were also offered. For example, LSES70 said, “I cannot stop having disease if Allah (God) wants”.

4.8.3.3 Consequences of not taking preventive action

To describe the consequence of not taking any preventive actions, LSES73 said, “Death. No one can prevent dying”.

4.8.4 Responses concerning lifestyle questions

In the lifestyle practice section, HSES59 said that the reason for maintaining the same smoking status in the previous year can be considered a social factor: “I cannot say ‘no’ to my friends. If they offer me a cigarette and I refuse them, it does not seem good.” Participant HSES127 discussed a variety of reasons for reducing his smoking status in the previous year: “To prevent heart disease/diabetes and to reduce environmental pollution and passive smoking; people do not like smoking”.

LSES25 described a sociocultural reason for quitting smoking: “One day I was smoking alone and my elder brother’s friend saw me to smoke; I was embarrassed and afraid that he would tell my family. … From that day I have not smoked, ever.”

4.9 Summary

The main finding of this research is that the overall knowledge and awareness about CHD in both groups in Bangladesh was poor (mean knowledge score 14.20 ± 6.1, mean awareness score 7.77 ± 3.3). However, the lifestyle practices of the participants were good (mean lifestyle score 3.58 ± 0.62), but participants from the HSES group had a better level of knowledge and awareness of CHD. Although the participants’ level of knowledge and awareness of CHD was significantly correlated in both HSES and LSES groups, lifestyle practice was associated with neither knowledge nor awareness about CHD. According to the multiple regression analyses, knowledge can be best predicted by SES when it is included with age and gender, and according to the standardised coefficients ($\beta$), SES is the strongest predictor of CHD knowledge (0.72 for SES vs 0.07 for age). People of higher SES, and those who were older, tended to have better knowledge about CHD. The models also revealed that awareness can be predicted by SES but it does so more effectively when gender is included in the model ($R^2 = .293, p < .001$). Although gender plays a role in predicting CHD awareness, once again the standardised coefficients ($\beta$) show that SES is the stronger predictor of CHD awareness (0.49 for SES vs 0.17 for gender). People of higher SES, and males tended to have more awareness about CHD. For lifestyle practice the best model to predict lifestyle practice is by SES and age ($R^2 = .1078, p < .001$). However, according to the standardised coefficients ($\beta$), surprisingly age is the stronger predictor of lifestyle practice (0.03 for SES vs 0.37 for age). Younger people, and those of higher SES, tended to have better lifestyle practices.
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5.1 Introduction

This is the first study to evaluate CHD knowledge, awareness, and lifestyle practices among a Bangladeshi population within the context of their socioeconomic status in an urban setting of Dhaka. In this chapter I discuss the significance of and seek explanations for the findings with reference to the existing literature. I also discuss the limitations of this study and provide recommendations for future research.

5.2 Sociodemographic characteristics of participants

In this study, people of high socioeconomic status (HSES) and low socioeconomic status (LSES) were compared in a general population in Dhaka city, Bangladesh. The significant difference between the mean ages of HSES and LSES participants may have been a function of the selection process and criteria used to define HSES and LSES. The Kuppusswami socioeconomic scale was applied, which relies strongly on education level and income, and may therefore not be appropriate in terms of the socioeconomic distribution found in Bangladesh. The main issue with using the Kuppusswami socioeconomic scale with the current population was that the study required that higher officials with higher income and education level from the offices of public and private sectors who had higher age to be recruited leading to a greater disparity in terms of SES to the LSES who commence working at a much younger age. In the HSES, the number of male participants was higher than the number of female participants as data had been collected from workplaces for HSES participants and in Bangladesh gender inequality exists in employment (A. Alam, 2017). This gender difference, most notable within the workplaces of the HSES participants, was also reported by Saeed et al. (2009) who had interviewed a sample population in India to evaluate knowledge of risk factors of CHD, where the number of male participants was four times higher than female participants. The influences of this age and gender disparity on the study findings are discussed in Section 5.8. Participants of HSES have overall better education, occupation, income,
and residential location than the LSES which might have played a role in some of the results discussed below.

5.3 Physiological status of participants

The physiological status of the participants was measured as part of obtaining general characteristics of the study population and to measure whether this differs between the HSES and LSES. Body mass index (BMI), waist circumference (WC), systolic blood pressure, and percentage of self-reported prediagnosed diabetes were significantly higher among HSES participants. Of interest is that BMI in the HSES was above the recommended level (> 23kg/m$^2$) for Asian people (Barba et al., 2004). This suggests that Bangladesh may be undergoing a health evolution, which may reflect changes in lifestyle practices especially with an increasing affluence in the Asian countries in the last 10 years following the most recent recommendations by Barba et al. (2004). This high trend for obesity was not observed in the LSES primarily due to the type of work associated with the LSES group. Similar to BMI, the WC of the HSES was also higher than in the LSES participants and may be linked to age differences between the two SES groups, lifestyle, and dietary pattern. People of HSES consume more fast food than do those of LSES. In another country of the Indian subcontinent, Pakistan, fast food consumption is also higher among the educated people with higher incomes (Baig & Saeed, 2012). The overall obesity and being overweight are also above world standards as published by the World Health Organization (WHO, 2016a). However, across the Indian subcontinent, the current LSES cohort also had a greater proportion of people with high BMIs compared with the study conducted in urban slum in India (R. Singh, Mukherjee, Kumar, & Singh, 2012). Setting appropriate cut-off values may have led to the different results compared with the Indian study, which took the BMI cut-off at > 25kg/m$^2$, whereas the current study was based on the recommended cut-off for the subcontinental Asian population. Lifestyle practices, specifically nutritional intake, may have played a role, as the proportion of overweight people, according to WC in the current study, is below that of the Indian cohort, unless the method of obtaining WC was different with the tapes not placed at the same level of the waist. This could not be checked as it was not specified in the paper by R. Singh et al. (2012). Finally, the proportion of obese people in the HSES group in the current study was also almost 2.5 times higher than in a similar study carried out among the urban affluent society in Bangladesh in the period between 2004 to 2005 (Alamgir, Akter, & Begum, 2005) and
in an Indian study suggesting demographic changes within the sub Indian population and associated changes in lifestyle (Pradeepa et al., 2015).

Blood pressure measurements are a good indicator of health in a community. Again this study showed a difference between the two SES groups, with the HSES group having significantly higher systolic and diastolic blood pressures. Higher age and BMI levels among the HSES group might responsible for this as it is evident that age and higher BMI are always associated with higher blood pressure (Dua, Bhuker, Sharma, Dhall, & Kapoor, 2014; Pinto, 2007) and is reflected in a meta-analysis (Saquib et al., 2012). However, the percentage of HTN among the total sample in the current study is similar to the USA at 29.1% among the US adults aged 18 and over between 2011 and 2012 (Nwankwo, Yoon, Burt, & Gu, 2013). Overall the proportion of the HSES and LSES having higher blood pressure has also increased in the last 14 years similar to that observed for obesity above (Podymow et al., 2002).

In line with the increase in obesity a similar trend was found for the prevalence of self-reported prediagnosed diabetes, which was also higher among the HSES than in LSES. However, the percentages of “potential new cases of diabetes” and “prediabetic” participants measured using a finger prick glucose test revealed no significant differences between the two groups, and indicate that the LSES have a similar risk to the HSES group. The proportion of new cases of diabetes and the self-reported prediagnosed diabetes at 8.9% in the current study also indicates an increase in the prevalence of diabetes compared to results of a meta-analysis conducted from 1995 to 2010 at 6.7%. This latter study, however, differed from the current one as participants were recruited from both the rural and urban areas and it is notable that the prevalence of diabetes among the urban group of that study was nearly double that found in rural areas (Saquib et al., 2012). The estimated proportion of diabetes in the current study is also comparable with the global estimates of diabetes with 8.5% and reflects the recent rise in diabetes to levels reported by developed nations and the seriousness of the disease in Bangladesh that has to be addressed (WHO, 2016b).

Consistent with BMI and blood pressure, known CHD was higher in HSES than in LSES but it was not statistically significant and for total data the percentage of self-reported CHD was higher than the national average of 2.5% in Bangladesh (Iyer, 2011). Differences in the percentage of CHD to other studies were evident and a consequence
of how data had to be determined in the current study. The percentage of LSES with CHD was lower for instance than in a study conducted by Podymow et al. (2002) in slum areas of Dhaka, Bangladesh in which a 6% of CHD was found relying on official data. However, there is a constant turnover within the slum population with inhabitants usually staying for a number of years and then returning to their villages. This may lead to varying prevalence over time. The age distribution, gender, and type of work may have also influenced the results. Slum dwellers in Bangladesh and specifically in cities such as Dhaka are also under constant risk of eviction and live in general under much poorer sanitary conditions (Rashid, 2009). Overall in Bangladesh, data over the last 10 years has shown that the prevalence of CHD, hypertension, and diabetes has increased (Saquib et al., 2012).

5.4 Medication use by participants
An important aspect of health behaviour linked to knowledge and awareness of CHD is use of medication. From the interviews, nonadherence for use of antihypertensive medication was high at over a quarter of people interviewed but is consistent with a previous study conducted in a rural Bangladeshi population in 2014 (Khanam et al., 2014). Similar nonadherence but not as pronounced was also seen in the HSES suggesting that level of knowledge and awareness of HTN, CHD, diabetes, and their health outcomes may not play a significant role. This is discussed in a later section. Previously suggested two reasons for nonadherence were financial and the use of traditional medicines. However, some participants illustrated a poor level of knowledge especially in the LSES group by stating they did not need it, or they would be cured automatically. Within the HSES group a common belief was that they could control HTN, diabetes and hyperlipidaemia only by lifestyle modification without knowledge and awareness of the extent of their disease progression and the presence of risk factors such as obesity and sedentary lifestyle. The HSES especially were being linked with dietary intake, which has changed in the last 10 years with increasing affluence. Lack of knowledge was also apparent in responses such as (paraphrased): “…if I take these medicines for my chronic diseases it would make me dependent on these medicines and I would not be cured”. Lack of education and knowledge about disease conditions can play a role in noncompliance and has been reported by Rao, Kamath, Shetty, and Kamath (2014) in India, and similarly in the USA by Iuga and McGuire (2014). In addition, the asymptomatic and lifelong nature of the disease, health care provider’s
mode of delivering treatment, the relationship between patients and health care professionals, and cultural beliefs about traditional remedies play role for this nonadherence of medication (Khanam et al., 2014, K. Kumar, Greenfield, Raza, Gill, & Stack, 2016).

5.5 Knowledge about CHD

This research demonstrated poor knowledge of CHD, with less than one third of participants achieving an acceptable score (see Chapter 4) and may be associated with lack of health education programs about noncommunicable diseases such as CHD in formal education (Bureau of Health Education, 2015). In comparison, a Malaysian study reported approximately 70% of participants with good knowledge (Muhamad et al., 2012). Similar studies carried out in India, Pakistan, and Nepal with similar sociocultural background showed lack of knowledge in their study population (Jafary et al., 2005; Saeed et al., 2009; Vaidya et al., 2013). For example, in Nepal nearly 44% of the participants showed insufficient level of knowledge (Vaidya et al., 2013) and among a Pakistani population group the median knowledge score 3 out of 15 was considered as indicating a severe lack of knowledge about CHD (Jafary et al., 2005). However, in the current study, HSES participants demonstrated a better level of CHD knowledge than did LSES participants. This can be attributed to the better level of education in the HSES group, discussed later. Previous studies conducted in Pakistan and India also reported knowledge about CHD increased with the acquisition of formal education (Jafary et al, 2005; M. S. Khan et al., 2007; Saeed et al, 2009). In addition, similar to this current research, Jafary et al. (2005) demonstrated that groups with a better economic status had a better knowledge score.

Differences between perceived knowledge, which was determined by asking what the participants thought about their level of knowledge about heart disease compared with estimated knowledge determined by validated questions included in the questionnaire, provided an interesting aspect that directly correlates with knowledge and awareness. In the current study, both the HSES and LSES participants overestimated their level of knowledge, with the HSES participants stating neither good nor poor level of knowledge but with an estimated poor level of knowledge compared to the LSES participants, who saw themselves as having a poor level of knowledge but in fact had a very poor level of knowledge. Similar results have been reported of discrepancies
between actual and perceived levels of CHD knowledge in a Canadian study where participants saw themselves as moderately or well informed but actually had poor knowledge. The Canadian study where the majority of participants (80%) had poor knowledge highlights the fact that developed countries still struggle with improving health care and especially in the LSES group of the current study much more needs to be done to improve health outcomes through prevention (McDonnell, 2014). In addition, advancing age affects health literacy and can be a factor, especially in the results obtained for the HSES group which were on average older (Toci et al., 2014). Advertising campaigns are partly the answer to address lack of knowledge and awareness of disease processes, identification, and prevention, provided they address not only the cultural differences between the LSES and HSES groups but also the level of knowledge and what this level of knowledge actually consists of (Bener & Ghuloum, 2011). The role of perceived knowledge has not been extensively investigated and is a direction for future research to gain a better understanding of how to address health care in Bangladesh possibly using the SF-36 health survey, which includes health perception (Brazier et al., 1992). Certainly perceived health influences perception of health service delivery, and an inaccurately high estimation may lead to a more negative view of health services and lead to decreased uptake of these services (Paul, Hakobyan, & Valtonen, 2016). In addition, cultural norms such as the acceptance of obesity influence health perceptions, and possibly lead to an increase in CHD and other chronic illness (Gregory, Blanck, Gillespie, Maynard, & Serdula, 2008).

5.5.1 Knowledge about CHD pathophysiology

Knowledge of CHD pathophysiology entails a better understanding of the physiological or biochemical changes in the body and includes knowledge of the effects of risk factors. Two questions were asked to evaluate knowledge of CHD Pathophysiology, namely what participants know about CHD and what changes take place after having CHD. The LSES participants demonstrated a striking lack of knowledge in this domain of CHD knowledge with very few (10.8%) having any knowledge of the pathophysiological process, and one third mentioned risk factors. They were not specifically asked about CHD pathology and therefore only indirect evidence could be gathered due to lack of understanding of what is meant be pathophysiology or disease progression. Participants were asked “What do you understand about heart disease?” or “What do you think changes do occur in the body, if a person has heart disease?”
Within the LSES a lack of knowledge about what the heart is or does was also evident. In this case the question had to be rephrased to: “… something is beating / vibrating in your chest, what you call it or what will happen if this is affected?” Education level may certainly be a factor here and also the Anglicisation of the language (Narayan, 2013). During interviewing, a Bengali translated questionnaire was used where the Bengali terms of “heart” or “heart disease” were used and it was found that to interview the LSES, it was almost always necessary to use the English term, “heart” with the Bengali term of “disease” as they did not understand the Bengali term of heart or heart disease. During the interview, participants who did not know anything about heart disease were asked the question differently so they understood the question. As a result, a picture of heart was drawn for two participants and very surprisingly they recognised it as “love”, another said “liver”. As a result, a linguistic factor may play role for their lack of understanding of heart disease as of the health education programs broadcast on TV or radio use the Bengali term of heart disease which is literally very rich according to Bengali dictionary. Similar to the first question, when the participants were asked about the changes that took place after having CHD, more than 80% of HSES participants said malfunction of heart due to inappropriate circulation followed by blockage of arteries, whereas around 75% of the LSES participants replied they did not know. To the question “What do you know about heart disease?” most of the LSES participants mentioned symptoms of CHD especially chest pain similar to a study in Pakistan (Jafary et al., 2005). An interesting aspect of health education was that within the LSES Bengali movies and dramas played a pivotal role in showing how the heart is connected to chest pain and heart attack.

The majority of the HSES understood pathophysiological process and were able to describe these without more prompting followed by listing of risk factors. The HSES group has more information available including visiting health care professionals, reading newspapers, or watching health education programs on television. The participants were not asked about sources from where they had learned about CHD; most of the participants automatically replied about the sources.
5.5.2 Knowledge about CHD risk factors

Once again participants, especially the LSES participants showed a lack of knowledge about CHD risk factors. Apart from mental stress, they showed very poor knowledge of all 13 expected risk factors listed by the WHO (2011b); however, less than half of LSES participants were able to state stress as a CHD risk factor. This was unusual as recent publications within the slum areas of Bangladesh indicate that anxiety and stress are very important health determinants due to the uncertainty of not being evicted from their place of residence and poor sanitation (Rashid, 2011). The HSES participants mostly identified the behavioural risk factors such as unhealthy diet, mental stress, smoking, and physical inactivity than physiological risk factors like DM, HTN, obesity, high cholesterol, and nonmodifiable risk factors. Fewer participants mentioned nonmodifiable risk factors such as age, family history, and genetic factors, and none of the participants from either group mentioned gender as a risk factor. This finding is consistent with the findings of the study conducted by Vaidya et al. (2013) in Nepal where the main risk factors were smoking followed by physiological factors such as elevated blood pressure. Risk factors of disease are more often mentioned in television and the news and may have contributed to the better response observed in the current study, whereas pathophysiological processes are less likely to receive media attention. Behavioural risk factors such as alcohol consumption and tobacco chewing was low among the HSES participants and very low among LSES participants. Responses for alcohol consumption were fewer, possibly because this factor is less prevalent among Bangladeshis because of cultural nonacceptance which is discussed in the lifestyle practice section below, which was as expected due to the cultural and religious background of participants, although some under-reporting may have also occurred (Dewan & Chowdhury, 2015). Response for tobacco chewing was also low and linked with the HSES primarily smoking cigarettes, whereas the LSES participants were more ignorant of its harmful effects (Nargis et al., 2015).

In the current study, knowledge about CHD risk factors was notably lower than has been reported in the studies conducted in developed nations (Fernandez et al, 2008; Sanderson et al., 2008; Wartak et al., 2011). For instance, in a study in Australia, 87% of women mention smoking as a risk factor followed by HTN 83%, physical inactivity and obesity 72%, and 64% mentioned ≥ 5 risk factors out of 6 risk factors the researchers of that study evaluated (Fernandez et al, 2008). Similarly, 69% of the
respondents were able to state ≥ 5 risk factors out of 7 expected risk factors of a study conducted in the USA (Wartak et al., 2011). Combined, this suggests that programs need to be put in place that are suitable for people of both HSES and LSES that improve on the knowledge level within the Bangladeshi community to curb the increasing prevalence of obesity, hypertension, and diabetes.

However, participants mentioned some factors that are not considered to be traditional modifiable or nonmodifiable risk factors such as food adulteration, air pollution, infection, and drug addiction that are associated with CHD. This reflects more a lack of these factors being included in current guidelines rather than a lack of knowledge in the Bangladeshi population. For example, the possible pathogenesis of chronic infections may lead to atherosclerosis (S. Gupta & Camm, 1997). In Bangladesh, the prevalence of various infectious diseases is high (Mahmood, Ali, & Islam, 2013), especially in slum areas where poor environmental management such as deficient access to safe drinking water and sanitation, stagnation of water, poor drainage with excessive open sewers, excessive amount of uncollected rubbish, severe overcrowding, and flies are the major characteristics (M. M. H. Khan & Kraemer, 2008). Similarly, recent epidemiological studies have claimed a link between air pollution and CHD, especially with the several common air pollutants including particulate matter of different sizes (PM$_{2.5}$, PM$_{10-2.5}$), ozone (O$_3$), sulphur dioxide (SO$_2$), nitrogen dioxide (NO$_2$), and black carbon (Gan et al., 2011; Kessler, 2005). The various accepted pathophysiological mechanisms include enhanced coagulation/thrombosis, a propensity for arrhythmias, acute arterial vasoconstriction, systemic inflammatory responses, and the chronic promotion of atherosclerosis (Brook, et al., 2004). According to a recent study, the quality of air in Dhaka city was one of the poorest in the world and the level of total suspended particles (TSP), SO$_2$, and NO$_2$ were found to far exceed the recommended WHO standard levels (Gurjar, Butler, Lawrence, & Lelieveld, 2008). In addition, association between drug addictions contributes to adverse cardiovascular effects, ranging from abnormal heart rate to heart attacks (American Heart Association, 2015). The available drugs in Bangladesh are opium (heroin, pethedine, and cocaine), cannabis (ganja, chorosh, bhang, and hashish), stimulants (yaba and ecstasy), cough syrup (Phensidyl and Dexpoten), and glue (Shazzad et al., 2014).

The lack of knowledge that smoking is the most preventable risk factor again reflects the lack of education programs and health literacy in both the HSES and LSES groups.
The majority of HSES participants were aware of an unhealthy diet, which has been increasing in the subcontinent with an increase in affluence, especially in the HSES (Aloia et al., 2013). The LSES participants mentioned mental stress as the single most preventable risk factor, which reflects the anxiety many slum dwellers feel due to the prevailing living conditions and uncertainties of retaining their place of residence.

5.5.3 Knowledge about heart attack symptoms

Knowledge about chest pain is not sufficient because chest pain due to heart attack is often misunderstood as chest burning due to gastrointestinal problems and to differentiate the chest pain of heart attack, people need to know other common symptoms such as radiated arm pain, sweating, and upper body discomfort (neck pain, jaw pain) to seek early intervention. In their study carried out in Pakistan, M. S. Khan et al. (2006) reported that two thirds of heart attack patients delayed presenting themselves to a hospital due to an inability to recognise the heart attack symptoms. In the present study, apart from chest pain, participants of both groups, but especially LSES participants, revealed insufficient knowledge of heart attack symptoms such as breathlessness and sweating, and even lower knowledge about important symptoms such as radiated arm pain, dizziness, vomiting/nausea, upper body discomfort, and tiredness. Nevertheless, the responses were better than reported in the Pakistani study (M. S. Khan, 2007) where more than 80% of the participants did not recognise any heart attack symptoms. Compared with a Malaysian and Korean study, both the Bangladeshi and Pakistani study indicated a much lower knowledge of symptoms, with 86.6% mentioning breathlessness followed by chest pain (85.9%), palpitation (81%), and around 36% recognising jaw, left shoulder and pain, and nausea/vomiting (Kim et al., 2011; Muhamad et al., 2012).

5.5.4 Knowledge about CHD prevention and treatment

In contrast to lack of knowledge for identifying risk factors of CHD and symptoms of heart attack, 90% of participants in the HSES and 60% in the LSES demonstrated a good level of knowledge related to CHD prevention. These percentages are higher compared with 53% of the Indians and Pakistanis living in the USA who believed that CHD could not be prevented (Kandula et al., 2010). Although the majority of LSES participants said CHD could be prevented, they demonstrated a noticeable lack of knowledge about how CHD could be prevented, with one third suggested that CHD
could be prevented by controlling or avoiding CHD risk factors, where a majority of HSES respondents (88.2%) felt so. This reflects the lower level of knowledge in the LSES for CHD risk factors (Kandula et al., 2010) which is a function of education level in this study.

In spite of the education gap seen between the HSES and LSES participants, both SES groups showed a very good level of knowledge regarding CHD treatment as almost all of the HSES (99.6%) and 95% of the LSES participants thought CHD could be treated. Participants of both groups also showed a reasonably good level of knowledge considering medication as a part of CHD treatment. That LSES and HSES participants exhibited equivalent knowledge about medicine might be a consequence of an assumption made by many participants, one of whom said: “Every disease has treatment and it can be treated by medicines for sure”. However, the LSES group was not familiar with surgical intervention for CHD. Moreover, nearly one fifth of the LSES participants did not know how CHD could be treated. Certainly, access to hospitals and surgical treatment is much less in the LSES group, and therefore is reflected in the lack of knowledge. However, despite the higher level of knowledge within the LSES group for treatment, prevention is the most important factor that needs to be addressed as suggested by an Indian study, which highlighted the increased risk of CHD due to lack of knowledge of risk factors. The study further recommends that primary care providers are in a good position to improve assessment of CHD risk factors and to recommend changes in lifestyle practices and compliance with medication (Dhar, 2014).

5.6 Awareness about CHD

Previous studies about awareness of CHD were assessed by evaluating knowledge about CHD (Banerjee, 2007; Dodani et al., 2004; Schweigman, Eichner, Welty, & Zhang, 2006). As discussed earlier, knowledge about CHD is overall information about CHD including epidemiology, pathology, risk factors, prevention, and treatment (Hammer & Wilder, 2010; Jafry et al., 2005; Kandula et al., 2010). Awareness about disease conditions were mainly related to perceptions about the participants’ own health status. Al-Baghli (2010) evaluated awareness of CVD by assessing their study participants’ perception of having CVD in Saudi Arabia. Awareness of other chronic diseases such as HTN in Tunisia, Iran, the USA, and Japan (Hammami et al., 2011; Olives et al., 2013; Sabouhi et al., 2011; Tanihara et al., 1999), high cholesterol in the USA (P. Y. A.
Huang, Buring, Ridker, & Glynn, 2007) and diabetes in Jamaica (Cunningham-Myrie et al., 2013) were evaluated based on reports of prior diagnosis of HTN or diabetes by a health professional or having been prescribed medication for their HTN or diabetes, blood pressure, and cholesterol reading. A study conducted in Iran evaluating knowledge and awareness of HTN separately, asked the meaning if hypertension and for awareness asked about the participants’ own blood pressure level (Sabouhi et al., 2011). Similarly, in the present study, awareness of CHD did not overlap with knowledge about CHD and was assessed separately from knowledge by asking a set of questions such as presence of risk factors, awareness for taking preventive actions for CHD, medical conditions related to CHD, and heart health. The current study revealed a lack of awareness of CHD as most of the HSES participants showed neither poor nor good level of awareness and LSES participants demonstrated poor awareness based on the questionnaire of this study. Only 18% of the HSES participants had a good level of awareness, which was higher than that found for the LSES participants.

5.6.1 Awareness about one’s own risk factors

The current study was the first attempt to evaluate awareness of risk factors. In spite of having neither poor nor good levels of awareness about CHD, most of the HSES participants (61.8%) were aware of their own CHD risk which was higher than the 25.4% of LSES participants. However, in the follow-up question about what their own risk factors were, participants showed the gap of their awareness which affected their overall awareness score. This lack of awareness of one’s own risk factors is not uncommon and has been published in relation to various risk factors such as smoking and obesity (Bhattacharya, Gogoi, & Roy, 2016; Walker, Saltman, Colucci, & Martin, 2010). The possible reason for lack of awareness of one’s own CHD risk factors among LSES participants is their very poor level of knowledge about CHD risk factors. If the participants do not have enough knowledge about the CHD risk factors, they have less chance to be aware of their own risk factors. In contrast, the majority of HSES participants stated unhealthy diet followed by mental stress as CHD risk factors in the knowledge section, and these responses were consistent when their awareness of their own risk factors was investigated. However, it was also found that in spite of knowing a reasonable number of risk factors by some of the participants in both groups, they were not aware of any of their own risk factors. Recognition of obesity, being one of the main physiological risk factors, was very low in both groups, especially, among the LSES
participants, who may reflect lack of knowledge about obesity, and obesity is less prevalent among LSES group. In addition, being overweight or obese is becoming more of the norm within many societies and therefore is not seen as a risk factor (Leahey, Doyle, Xu, Bihuniak, & Wing, 2015).

5.6.2 Awareness about taking preventive actions

Awareness about taking preventive actions is another contributing factor that played a major role in distinguishing the awareness score between HSES and LSES participants. Only 10.4% of LSES participants were aware about taking preventive action for CHD which was far less than 57.1% of HSES participants. Participants who were aware of taking preventive actions for CHD, more than 70% of HSES and 60% of LSES participants responded they lead a healthy lifestyle such as physical activity, avoiding smoking, and maintaining a healthy diet followed by regular medical reviews and control or avoidance of some risk factors such as high blood pressure and diabetes, unhealthy diet, and mental stress. Apart from healthy lifestyle practices such as physical activity and healthy diet, the responses differed from the study conducted in the USA, where nearly 90% of the respondents mentioned they had annual medical checkups (Mosca et al., 2006). Why participants took preventive action was varied and included to be healthy, having chronic disease, high cholesterol, to live longer, and doctors ask them to do so.

Lack of knowledge of possible preventive action can again be seen as one of the major contributors to the lack of awareness, especially that observed in the LSES group. The lack of education and knowledge becomes more apparent because, despite knowing the consequence of not taking preventive actions for CHD, the LSES participants did not take any preventive actions. The most common reason for this lack of action was that they did not have CHD or any problem or they were healthy. This implied that participants’ awareness of chronic disease including CHD was dependent on an outside source making them aware following onset of first symptoms and visiting a primary health care facility.

5.6.3 Awareness about prediagnosed CHD and medical conditions related to CHD

The awareness of not having any medical condition such as HTN, diabetes, and high cholesterol was higher among LSES than among HSES participants, as expected
because the HSES group had a higher awareness about prevalence of diseases such as diabetes and HTN, which had been diagnosed by physicians, were older, and had better education. The LSES group had overall less diagnosed diabetes, HTN, and high cholesterol, and thus their awareness level was lower, especially when combined with their lack of knowledge of risk factors and signs and symptoms of disease. This result however, is primarily due to a lack of physicians available to the LSES group, and therefore there is a lack of information provided to the LSES group in terms of whether they have the disease or are prescribed medication that would raise their awareness. Similarly, a significantly larger proportion of participants with HTN and potential new cases of HTN in the HSES group were aware of having high blood pressure supporting a similar study in Bangladesh and India (Quasem et al., 2001). In a Jamaican study investigating awareness of disease between the HSES and LSES people, it was found that a higher proportion of HSES people were aware of having a medical condition related to CHD. Similarly, the proportion of awareness about medical conditions related CHD such as diabetes was also higher among HSES people than those in the LSES (Cunningham-Myrie et al., 2013). In both the Jamaican study and the joint study of Bangladesh and India, awareness of diabetes and HTN was associated with educational attainment. However, the joint study in Bangladesh and India also found that visiting the physician and gender were contributing factors to a better awareness, possibly reflecting gender roles.

Bearing in mind the difference between HSES and LSES participants in the level of awareness of other medical conditions, the awareness of CHD was almost same in both HSES and LSES participants, but below 10%, suggesting that CHD diagnosis and treatment is similar in both groups but that information about other diseases is more forthcoming in the HSES group than in the LSES group. A study conducted in eastern Saudi Arabia, which evaluated awareness about prediagnosed CVD (history of heart attack, angina, arterial disease, stroke, and transient ischemic attack) found that 2.7% were aware about their health condition, which was half of that found in the current study. This indicates that there are substantial disparities between countries possibly in terms of prevention of CHD and lifestyle practices leading to a lower prevalence of CHD in Saudi Arabia and therefore a lower level of awareness (Al-Baghli et al., 2010).
5.6.4 Awareness about taking action in the event of a heart attack

A majority (around 85%) of participants of both groups thought that in the event of having a heart attack they would seek medical attention including going to the doctor, seeking admission to a hospital, or asking someone to take them to hospital as soon as possible. Similarly, when asked what they would do if someone else was experiencing signs of a heart attack, around 90% in both SES groups thought they would seek help from a medical service. An expected response of calling an emergency number was not found for the Bangladeshi cohort due to there not being a 911 or 000 number to ring and a centralised system for accessing ambulance services as is the case in America and Australia (Mosca et al., 2013; WHO, 2014). This finding is similar to a study conducted within an urban population in Nepal with a similar socioeconomic background (Vaidya et al., 2013). A centralised system of emergency contact numbers for accessing ambulance services may reduce the morbidity and mortality rate of CHD in Bangladesh and is an avenue for the Bangladeshi government to consider in improving health.

5.7 Lifestyle practices

The majority of the participants of both socioeconomic groups maintained a “good” lifestyle. This finding is consistent with a study conducted among Malaysian women of high and low SES, where 51% showed good lifestyle practices (Muhamad et al., 2012). In this current study, it was expected that the lifestyle practice score might differ between the two socioeconomic groups. The similar results for the two groups may be due to the method applied in determining the lifestyle score from five domains including tobacco smoking, tobacco chewing, alcohol consumption, diet, and physical activity. Taking these five domains, the number of ex-smokers in HSES is higher than the LSES participants and this helped the LSES to obtain a better score than HSES in terms of smoking. On the other hand, the proportion of current tobacco chewers was significantly higher among LSES participants, which enhanced the chance of getting a better score for HSES participants, and therefore the scores balanced out. Several factors might play role in this, which will be discussed in a later section.

5.7.1 Smoking

Smoking is one of the most common lifestyle factors that affect CHD morbidity and mortality (Gersh, Sliwa, Mayosi, & Yusuf, 2010). In the current study, it was interesting to note that the there was a lower rate of current daily smokers compared with the
official Bangladeshi government figure of 26.2% (Directorate General of Health Services & WHO, 2011). This is possibly due to participant selection being restricted to urban centres in the current study whereas there is a relatively higher proportion of smokers in rural areas (Flora et al., 2009, Sultana et al., 2015). Moreover, the percentage of current daily smokers of this study is also similar with a population-based study conducted from 2001 to 2003 with the prevalence of urban current smokers being 19.1% (Flora et al., 2009), and another population survey (Global Adult Tobacco Survey, GATS) conducted from 2008 to 2010 and a percentage of 19.9% in an urban population (Sultana et al., 2015). This indicates that the trend of current daily smokers has remained almost the same in urban areas like Dhaka and is another area the Government needs to address. Although this present study showed similar smoking statistics to other studies, the prevalence of smoking among males was found to be higher than in Pakistan (Gilani & Leon, 2013).

Two projects have been active in Bangladesh to control tobacco use since 1999 and 2005 named Bangladesh Anti-Tobacco Alliance and Smoking and Tobacco Product Usage Act, 2005 at nongovernment and the government level, respectively. The project, Bangladesh Anti-Tobacco Alliance has been mainly working on educating people and policy makers about the harmful effect of tobacco, whereas the Smoking and Tobacco Product Usage Act, 2005 has been primarily working on implementing the law of tobacco usage such as restriction of smoking in public places, restriction of tobacco advertising, and attaching health warning labels on tobacco products to take up at least 30% of the packaging (Bleich et al., 2011). However, according to the studies (Flora et al., 2009; Sultana et al., 2015) mentioned in the previous paragraph and the results of the current research based on an urban population, these programs have not been successful in reducing smoking. As a result, it is necessary to identify reasons for these projects not achieving their goals among the urban population. Some of the strategies applied in developed countries such as the USA could be followed that put a high tax on tobacco (Centers for Disease Control and Prevention [CDC], 2016b). The USA reduced the tobacco consumption prevalence from 42.4% in 1965 to 16.8% in 2014, and their goal is to reduce the percentage to 12% by the year 2020 (CDC, 2016a).

In the current study, it was found that the percentage of smokers was higher among LSES than among HSES participants, but the difference was not statistically significant. However, previous studies have shown that smoking is more prevalent within the LSES
in Bangladesh (M. M. H. Khan et al., 2009; Sultana et al., 2015). It can be assumed that the age difference between the two SES groups and previous studies also supported this, showing that the younger cohorts were less likely to smoke. Other factors such as job pattern and education might also be responsible for higher smoking rates among LSES (Sultana et al., 2015).

In this study, there were no female participants who were smokers or ex-smokers in either socioeconomic group. Earlier studies also reported gender inequality in smoking in Bangladesh and consideration was given to social norms about smoking among women (Abdullah, Driezen, Quah, Nargis, & Fong, 2015; Flora et al., 2009; Hanifi et al., 2011). This unequal distribution in smoking among men and women is common in South Asia and South-East Asian countries (Sreeramareddy, Pradhan, Mir, & Sin, 2014) as well as in other countries. Smoking tobacco is more common among men in Russia and Indonesia at > 60% male prevalence in each country, and in China there is also approximately a 60% male prevalence of smoking (Gaziano et al., 2010).

Cultural condemnation plays a role in the low rate of smoking among women in Asia (Tsai, Tsai, Yang, & Kuo, 2008) and because of this nonacceptance, women may underreport their smoking. One study revealed that smoking among Bangladeshi women living in the UK is often hidden from family members (Roth, Aitsi-Selmi, Wardle, & Mindell, 2009). Although the percentages of current smokers within the two SES groups in the current study did not differ significantly; the percentage of ex-smokers was higher among HSES than LSES participants. This might be because the HSES participants were older. Abdullah et al. (2015) found that an older age group (25.2%) tended to have quit smoking when compared with a younger age group (6.4%). Because of their age, the older people had health issues including prediagnosed CHD, HTN, diabetes, and other health problems, which encouraged them to quit smoking and the majority of them mentioned such health problems as their reason for quitting.

The overall percentage of ex-smokers of this study is higher than the study conducted by Flora et al. (2009), suggesting that since 2009 social factors and improved awareness might influence the reduction in smoking.
5.7.2 Tobacco chewing

Although the percentage of tobacco smoking did not differ between the two socioeconomic groups, tobacco chewing status was significantly lower in the HSES and lower than at the national level of 31.7% (Directorate General of Health Services & WHO, 2011). This finding is similar to a study conducted in a rural population in Bangladesh where tobacco chewing is more common among people of LSES (Heck et al., 2012). The overall percentage of current tobacco chewers (12.1%) is lower than at the national level of 31.7% (Directorate General of Health Services & WHO, 2011). According to a previous study, this is possibly due to tobacco chewing being higher in rural areas than in the urban areas, and the present study has been conducted in an urban setting where the findings are very close with another study conducted in between 2001 and 2003 in the same setting (Dhaka city) with a percentage of 13.1%. Rural to urban migration may be a factor creating the differences between type of smoking and SES group (Cities Alliance, 2016). Educational attainment among people of LSES being lower may also be a factor for the higher use of chewing tobacco, which was reported in a study conducted Bangladesh, India, Indonesia, Cambodia, and Philippines where the groups with a higher education level tended to smoke cigarettes rather than smokeless tobacco (Sreeramareddy, Pradhan, Mir, & Sin, 2014).

Though tobacco smoking was unusual among the female participants, tobacco chewing was very common (18.1%). Previous studies have also reported a higher prevalence of tobacco chewing among female participants (Rahman & Zaman, 2008) who found that 15.9% of female CHD patients attending tertiary care hospitals were only tobacco chewers. The higher rate of tobacco chewing among females is more than likely due to cultural acceptance (P. C. Gupta & Ray, 2003). According to data from 2006 to 2009, use of the smokeless tobacco was higher in Bangladeshi females than males while in other countries of the WHO South-East Asian region, such as Bhutan, India, Myanmar, Nepal, and Sri Lanka males chew tobacco more than females (WHO, 2011b).

5.7.3 Alcohol consumption

Current alcohol consumption was very low among both socioeconomic classes with the percentage of occasional drinkers being higher in the HSES than in the LSES participants. According to the latest data at a national level, in Bangladesh the
percentage of the abstainers from alcohol consumption in the previous 12 months for people aged > 15 years across both genders was 98.1%, indicating that 1.8% consume alcohol (WHO, 2014). This corresponds to the finding of the current study. Overall, the prevalence of alcohol consumption is low in Bangladesh compared with other countries in the world, including China, Africa, South and North America, Europe, and Australia reporting alcohol consumption at 26.9% (Joshi et al., 2007). This difference is probably due to alcohol consumption being culturally and religiously prohibited in South-Asian countries and even more strictly in Muslim countries such as Bangladesh. However, WHO and the Food and Agricultural Organization reported an upward trend in alcohol per capita (age > 15 years) consumption in Bangladesh from < 0.004% in 2001 to 0.2% in 2010 among the total population (G. Dewan & Chowdhury, 2015).

5.7.4 Dietary habits

The amount of fruit and vegetable intake among the study population was low, and there was no significant difference between the two socioeconomic groups. The majority of the participants of both HSES (92.4%) and LSES (96.7%) consumed less than five serves of fruit and vegetables, similar to national estimate of 95.7% (Directorate General of Health Services & WHO, 2011). This compares with approximately 20% of adults consuming at least five serves of fruit and vegetables in developed countries such as Australia, according to the Australian Bureau of Statistics (2012). In the USA, it was around 13% in the year 2013 (Moore & Thompson, 2015). Various reasons for the low vegetable and fruit consumption, including food adulteration, were given by participants in the HSES group. Food adulteration is a major public health problem in Bangladesh for the last two decades due to the use of formalin in food. Supermarkets openly sell fruit, fish, and vegetables that have been treated with formalin to keep them fresh (A. N. M. A. Ali, 2013). Not only formalin, but pesticides, calcium carbide, and toxic colours are widely used (A. K. M. M. Islam & Majumdar, 2013; Solaiman & Ali, 2014). On the other hand, the LSES participants thought they were not able to afford the cost of fruit, and very few of them mentioned food adulteration as a reason. However, when they were reminded by the researcher that some of the local fruits were not too expensive, they agreed and replied they did not think about it, and this may have been due to their lack of knowledge about dietary intake. Hall, Moore, Harper, and Lynch (2009) also discussed price of fruit and vegetables as the barrier for low consumption of fruit and vegetables among low-
income consumers. Another possible reason for this low intake of fruit and vegetables might be higher intake of grains especially people of LSES (M. Z. Islam, Akhtaruzzaman, & Lamberg-Allardt, 2004). The current study showed that the mean serves of grain consumption in both groups are similar (HSES 11.91 ± 3.5 vs LSES 12.08 ± 3.3 serves). Comparing consumption with the dietary guideline of a developed country such as Australia, where the recommendation level range from 3–6 serves per day for adults, this level of grain intake is very high (Australian Dietary Guidelines, 2013). However, according to the dietary guidelines for Bangladesh, this finding is within the recommended level of 9–15 serves per day for adults (Nahar et al., 2013).

Salt intake is also high among the Bangladeshi population. According to the National Heart Foundation Hospital and Research Institute (as cited in WHO, 2011b), the average salt intake among Bangladeshi people is 16g which is more than triple the recommended level. In this study, the percentage of extra salt intake was more than 3 times higher among LSES (56.7%) than among HSES participants (16.4%). However, these intakes were lower than revealed in a study conducted among CHD patients attending a tertiary level hospital in Dhaka city in Bangladesh, where it was reported that 60% of the patients consumed extra salt in their meals (Trisha et al., 2014). Trisha et al. (2014) conducted their study among CHD patients mainly from the LSES whereas the current study surveyed the general population. The reason for the higher intake of salt among Bangladeshis was discussed by Brito-Ashurst et al. (2011), who suggested that deeply rooted dietary beliefs and attitudes, and a culturally established taste for salt, as the reasons. Usually, LSES groups consume more rice, although in this study rice consumption is not significantly different from that of people from the HSES. However, previous studies showed people living in urban slum areas mostly consume rice, lentils, potatoes, and green leafy vegetables, and consume smaller amounts of eggs, fish, meat, or a meat alternative (Torlesse, Kiess, & Bloem, 2003). My study finding also supports this claim as 26.3% of LSES participants did not consume fish, meat, or an alternative daily, and of them the majority (59.0%) consumed extra salt in their meals and it is assumed that low intake of egg, fish, meat, or alternatives might lead them to consume extra salt in their meals. Therefore, further investigation is necessary.

Soft drink use was higher among HSES than among LSES participants, but not at a significant level. Overall, soft drink consumption was less than 5 drinks per week. Compared with another study conducted among adolescent school girls in Dhaka city...
between 2005 and 2006 where 44% of study participants consumed soft drinks, the current study participants demonstrated higher percentages of soft drink consumption, indicating a possible upward trend of soft drink consumption. Of interest is that 60% of a university student population surveyed in Saudi Arabia consumed more than 5 soft drinks per week (Sabra et al., 2007). The soft drinks could not be compared with global estimates of soft drink consumption as global average estimates were based on daily consumption in gallons which might be conducted in large scale studies. However, the mean ± SD serves of soft drink consumption among the total participants were converted into gallons and a rough estimation was found that the participants of the current study consumed roughly 4.13 gallons of soft drink per person in a year where the global estimate is 11.4 gallons in 2010 (Basu, McKee, Galea, & Stuckler, 2013). As a result, further investigation of specific consumption trends and reasons for soft drink use is required. The high percentage of soft drink consumers among LSES participants might be due to their young age and advertisements telecast on TV. For example, an observational study observed six television channels for one hour in the evening and one hour at night in Bangladesh and found that up to 11 unhealthy food advertisements were telecasted in one hour in a channel and for children the maximum number was 16. Half of the advertisements for unhealthy products were for sugary drinks such as soft drinks, energy drinks, artificial juice, and so-called nutritional beverages (Work for a Better Bangladesh Trust, 2015).

Unlike soft drinks, a significant difference in fast food consumption was evident between the two socioeconomic strata in that the proportion was higher among HSES (68.9%) than among LSES (35%) participants. This lower percentage among LSES participants was due to financial inability as a lot of them responded very regretfully that they were not able to afford the so called “good food” reflecting their lack of knowledge about healthy food. This finding of fast food consumption among the total participants was much lower than among the university students in Dhaka city where the percentage of fast food consumption was 98.5% (Bipasha & Goon, 2013). This might be due to half of the respondents in the present study being from the LSES and most of HSES participants were of older. The practice of this fast food consumption has been changed in the last two decades due to several factors such as globalization, rapid growth of corporate houses, private universities, busy lifestyle, women’s involvement in jobs, and improved financial status (Bipasha & Goon, 2013). Due to the advancement of the society and financial activity, people are becoming busier and because of this
business people do not have enough time to cook in their houses and prefer to eat food that is already prepared (Harun, Ahmed, & Maniruzzaman, 2013). Knowledge and awareness of the effects of fast food might play a role in changing this behaviour, but it is still inconclusive. Previous research demonstrated in India that among university hostellers the majority knew the association between obesity and heart disease (61.8% and 73.3% respectively) but still they consumed fast food and more than 70% consumed fast food for their craving for different tastes and 12% consumed it as a normal meal. In addition, 77.1% of them knew instead of fast food they had a better option such as fruit but the majority of them (72.5%) believed that advertisements had influenced their fast food eating behaviour (H. Kumar, Palaha, & Kaur, 2013). Advertising of these unhealthy foods in the mass media might play a role in increasing unhealthy diets in Bangladesh as people might be influenced by the advertisements. In a recent observational study, the researchers reported that the percentage of advertisements on billboards and signboards of sugar-sweetened beverages was 51%, and 49% were related to junk food and in those, 19% were for each category. They did not find any advertisements for healthy food such as whole grains, fresh fruit, or vegetables (Work for a Better Bangladesh Trust, 2015).

5.7.5 Physical activity

Almost half of the participants of LSES were physically active at their work, which in contrast was very low in HSES participants due to the different patterns of the work of these two socioeconomic groups. However, the mean level of activity is much higher than the global estimates in high income countries, where 30.5% were insufficiently physically active (WHO, 2016c). This finding of physical activity at work for LSES people corresponded with a study conducted in Bangladesh in 2010, where the researchers demonstrated that the physical activity at work in urban areas was 47% (Moniruzzaman et al., 2016). Apart from work, more than half of HSES and nearly 70% of LSES participants were either sedentary or only lightly active during their leisure time. This lower percentage of physical inactivity among LSES apart from their work is perhaps due to them being already physically active at their work. My finding however, showed a higher level of physical activity during leisure time than in the study conducted by Moniruzzaman et al. (2016) as they reported 15% of study population in an urban setting involved in physical activity during leisure time. The higher percentage found in the current study may be due to over reporting or due to a better awareness and
knowledge of the importance of physical activity, especially in the HSES. These differences of the study findings to those reported by Moniruzzaman et al. (2016) are possibly due to the socioeconomic characteristics of the participants of this study. For example, the HSES participants were mainly office employees and most of the female participants were garment workers who also mainly work in a sitting position at their workplace. However, environmental factors that are linked to urbanisation such as an increase in the use of “passive” modes of transportation, fear of violence and crime in outdoor areas, high-density traffic, low air quality, pollution, and lack of parks, sidewalks, and sports/recreation facilities also play a role in this upward trend of physical inactivity (WHO, 2016c).

5.8 Correlations among age, gender, knowledge, awareness, and lifestyle practices

An emergent aim of the present study was to explore whether age and gender correlate with knowledge, awareness, or lifestyle practices. Several studies in the region including Pakistan, India, and Bangladesh have shown that age and gender are correlated with knowledge. A positive correlation with education levels was also observed affecting medication awareness (Mumu, Saleh, Ara, Haque, & Ali, 2014; Rujul, Vadgama, & Parth, 2012). Differences in the level of knowledge reflect classification of age range and questionnaire differences. Spearman’s rank-order correlation analyses were performed on the current data to identify the associations among age, gender, knowledge, awareness, and lifestyle practices for all participants of this study and separately for HSES and LSES.

5.8.1 Correlations of age with knowledge, awareness, and lifestyle practices

Age was positively correlated with knowledge and awareness for the total cohort, indicating that CHD knowledge and awareness of the participants increased with age. Moreover, on the basis of SES, age was weakly but positively correlated with knowledge in both HSES and LSES participants. This finding with regard to knowledge is similar to the findings of a study conducted in Pakistan where the knowledge score progressively increased from the ≤ 30 to > 60 years with a coefficient of 0.76, $p = .03$. Older participants tend to have a longer history of chronic disease and hence visit health professionals more often and have a better knowledge and awareness of CHD, which reflects better medication compliance seen in the current study. Similarly, Al-Baghli et al. (2010) also found higher age was correlated with greater awareness of heart disease.
However, on the basis of SES, age was not correlated with CHD awareness either in participants of HSES ($r_s = .105, p = .106$) or of LSES ($r_s = -.021, p = .744$). The lack of health education programs about NCDs, which was reflected in the low correlation coefficients, especially in the LSES participants who attained only up to a primary level of education (Bureau of Health Education, 2016). These low correlations suggest that there may be confounding factors present that were not being considered in the current study. Greater input from the government and primary health care services is, however, also required to increase knowledge and awareness about CHD in line with recommendations elsewhere for diabetes (Chavan et al., 2015).

Lifestyle practice scores of all participants were negatively correlated with age ($r_s = -.233, p < .001$), and this finding is consistent when the analysis was performed separately on the basis of SES. This indicates that younger participants achieved a better lifestyle score, and is similar to results from the study conducted by Vaidya et al. (2013) in Nepal in which respondents < 35 years of age had more satisfactory lifestyle practices than respondents > 45 years of age (38.5% vs 19.2%). The lifestyle score in the current study may have been skewed due to the smoking and physical activity scores as older participants smoked and chewed tobacco more, and were less physically active. Nargis et al. (2015) stated in their study that, overall, tobacco consumption prevalence was highest with a percentage of 70.9% among participants aged > 55 years and they also showed the prevalence of tobacco consumption among a national sample aged 15–25 years to be 26.7%. In the current study, however, tobacco consumption (either smoking or chewing, or both) was lower at 17.8%. Importantly, the finding on physical activity of my study supports the claim that higher age was associated with less physical activity. This decrease of physical activity with age was observed in both SES groups, with the LSES participants being less physically active at their work and HSES participants less physically active during their leisure time. Moniruzzaman et al. (2016) also reported that in urban areas of Bangladesh younger age groups were physically more active. Respondents 35–44 years of age spent 1,044 minutes at three domains (work related, transport, and leisure) in a typical week, whereas the respondents in the 55–64 year cohort spent 836 minutes, followed by people aged ≥ 65 years who spent 522 minutes on average.
5.8.2 Correlations of gender with knowledge, awareness, and lifestyle practice

Gender had a greater influence on the CHD knowledge and awareness within the total cohort. Male participants had better knowledge and awareness about CHD than did female participants. This association was stronger among LSES participants \( (r_s = -0.246, p < 0.001) \) than among HSES participants \( (r_s = -0.129, p = 0.047) \). This is in contrast to the research by Awad & Al-Nafsi (2014) in Kuwait, and Winham and Jones (2011) among African Americans, both of which demonstrated that women had a better CHD knowledge score. The higher percentage of prediagnosed chronic diseases such as diabetes, HTN, and CHD was higher among HSES males (10.6%, 23.5%, and 5.3%, respectively) than among females (8.8%, 20.6%, and 2.9%) might have contributed to this finding in my study as prevalence of chronic disease and access to health professional services have been shown to improve knowledge and awareness (Chavan et al., 2015). Analysing education level in the LSES indicated that 30.3% of females and 11.7% males had never attended school, and only 2.7% of females and 24.3% males of LSES attained up to either secondary or higher secondary school level. The better knowledge of females in the Kuwait study was attributed to the lower working hours of females who had more opportunity to spend time using the mass media that contains CHD information. Similar to CHD knowledge, women showed better awareness about CHD in a previous study conducted in eastern Saudi Arabia, which was also inconsistent with the current study (Al-Baghli et al., 2010).

In contrast, gender was not correlated with the lifestyle practice score \( (r_s = 0.01, p = 0.834) \) for the total study sample. However, although this finding is similar to the score for LSES participants, the HSES lifestyle practice score trended to be positively correlated with gender \( (r_s = 0.13, p = 0.051) \) and revealed that females of HSES led a comparatively better lifestyle than the males. Factors such as alcohol consumption, smoking, and tobacco chewing may have contributed to this finding. Combining tobacco smoking and chewing revealed that male HSES participants consumed more tobacco (either tobacco smoking or chewing, or both) than the female respondents (29.4% vs 8.8%, respectively; \( p = 0.003, \chi^2 = 8.75 \)). Cultural factors and SES again contributed as tobacco chewing is culturally accepted among women, but tobacco consumption declined with the improved socioeconomic status (females of HSES 8.8% vs LSES 23.9%) due to occupational patterns and better education, which is consistent
with findings from a study among Indian women (Mishra, Kulkarni, Gupta, & Shastri, 2015).

### 5.8.3 Correlations among knowledge, awareness, and lifestyle practices

The association between CHD knowledge and awareness in this Bangladeshi cohort with respect to SES demonstrated that knowledge and awareness were strongly correlated \( r_s = .601, p < .001 \) among all of the participants, indicating that people who had better knowledge about CHD also had better awareness about CHD. This result remained robust when the coefficient analysis was performed separately for the two SES groups. My finding is, however, similar to a study conducted to evaluate the association between knowledge and awareness about HTN in Japan (Tanihara et al., 1999), in which the researchers reported that health-related knowledge and awareness about HTN were strongly correlated. They assessed the relationship of awareness about blood pressure with separate aspects of knowledge such as dietary salt restriction and blood pressure (Odds ratio 1.81, \( p < .01 \)), daily salt intake and health status (Odds ratio 1.86, \( p < .01 \)), days of alcohol abstinence and health (Odds ratio 1.51, \( p < .05 \)), and obesity and blood pressure (Odds ratio 1.46, \( p < .05 \)). Similar correlations were also reported in India with respect to diabetes (Chavan et al., 2015).

In this current study there was no correlation between lifestyle practice, either with CHD knowledge or with CHD awareness among all of the participants. This finding was consistent when the coefficient analysis was performed separately for each socioeconomic stratum. Similarly, Murfinn (2010) did not find any association between knowledge of CHD and lifestyle behaviour among student nurses in England. In contrast, Yahya et al. (2012) found a strong association between knowledge and lifestyle practice in Malaysia, and Vaidya et al. (2013) demonstrated a weak association between knowledge of CHD and lifestyle practices. Several factors might play a role in the association between knowledge and lifestyle practice. These are discussed further in Section 5.8.6 in this chapter.

### 5.8.4 Predicting participants’ knowledge

Multiple regression analyses were used to explore the relationship of knowledge about CHD with SES, age and gender. Knowledge about CHD could be predicted by SES (Model 4, Table 4.19, Section 4.7.2.1 in Chapter 4) but was more effective after
including both age and gender in the model (Model 1, Table 4.19, Section 4.7.2.1 in Chapter 4). However, gender did not attain statistical significance, and hence SES and age were the main factors contributing to predict knowledge about CHD. Analysing the standardised coefficient of the model, it was revealed that SES played the most important role in predicting knowledge about CHD. This strong relationship between SES and knowledge may be a function of the SES classification based on the Kuppusswami scale, where SES is based on education, occupation, and income. Therefore, possibly due to the large disparity in the educational attainment of the participants between the HSES and LSES, the knowledge about CHD between the two socioeconomic groups differed significantly (Kang, Yang, & Kim, 2010). However, previous studies carried out in different populations including those from Canada, Jordan, and the USA also reported SES to be one of the important predictors of knowledge about CHD (McDonnell et al., 2014; Mukattash et al., 2012; Swanoski et al., 2012).

5.8.5 Predicting participants’ awareness

SES was able to predict awareness about CHD but it did most effectively after including gender in the model. According to the regression Models 2 and 3, age showed a trend in predicting awareness about CHD but was not statistically significant. The standardised coefficients obtained from the models demonstrated that SES is the most important predictor of awareness about CHD. A higher educational attainment in HSES participants and better knowledge and awareness about CHD are again the possible reasons for my findings. These were similar to conclusions in previous studies in Saudi Arabia that indicated a low level of awareness of CVD, which differed between regions but was strongly associated with level of education, although not with occupation or income (Al-Baghli et al., 2010; Al-Nozha et al., 2004). A study conducted in Iran, evaluating awareness about HTN, did not indicate any association between awareness about HTN and educational attainment, but revealed an association between awareness about HTN and gender, with women having a higher awareness score for HTN than men (Sabouhi et al., 2011). Contrary to the Iranian study, the current study revealed that men had a higher awareness score than women. Again, this might be a consequence of higher education among men of relative to women of LSES in this study and they might visit the health professionals more than women. There is no literature to support this statement that the men visit physicians more than do women, but decisions about
healthcare seeking for women is usually taken by the husbands because of the paternalistic cultural influences in Bangladesh (Walton & Schbley, 2013). In my study, a few female participants of LSES also mentioned that they could not obtain the necessary medication for HTN as their husbands did not buy them as well as their husbands not taking them to visit health care professionals. Walton & Schbley (2013) discussed this issue in their study with reference to Schuler et al. (2002) that one female participant of their study said, “I know that if my health fails my husband will not arrange treatment for me. I have to manage it myself, maybe by secretly taking something from the house and selling it to pay for the treatment”.

5.8.6 Predicting participants’ lifestyle practices

The best predictors for lifestyle practices were SES and age (Model 1). The multiple regression models showed that knowledge and awareness were also able to explain lifestyle practice when included with age. According to the standardised coefficients, age was the strongest predictor of lifestyle practices, which differed to my findings for knowledge and awareness where the best predictor was SES (see Section 5.8.1 for discussion about age and lifestyle).

Participants of both groups led a good level of lifestyle in spite of having poor CHD knowledge and awareness. Consequently, this finding questions the expected association between knowledge and lifestyle practices. In accordance with social cognitive theory, one’s knowledge and skills are the prerequisites to perform appropriate behaviour. However, constructs in this theory such as environmental factors may play a role in outlining an individual’s lifestyle practices (Redding, Rossi, Rossi, Velicer, & Prochaska, 2000). Hence, the contribution of socioeconomic, sociocultural, and environmental factors are evident in the findings of my study, which played a vital role in lifestyle practices among the both socioeconomic groups in spite of having a lack of knowledge. Compared with other smoking-prevalent countries such as Russia, Indonesia, and China, tobacco smoking prevalence was low in the current study in both socioeconomic groups (Gaziano et al., 2010) probably because none of the female participants were smokers as smoking among females is not culturally well accepted, but they chew tobacco. After combining the forms of tobacco use (either tobacco smoking or chewing, or both) still the males of both groups (HSES 16.6% vs LSES 18.6%) consumed more tobacco than females (HSES 3.4% vs LSES 14.1%) and LSES
males were the highest tobacco consumers. As a result, during estimation of prevalence of tobacco smoking among the total population, the percentage was low. If the results are considered only for male participants the data still indicate lower smoking prevalence (30.6%) compared with other countries (as mentioned above, Russia has 60% of smoking prevalence), possibly because the country is at an early stage of westernisation. Second, despite a lack of knowledge about alcohol consumption as a risk factor of CHD, very few participants were either current alcohol consumers or occasional alcohol consumers as alcohol consumption was culturally as well as religiously prohibited which could be regarded as a sociocultural factor.

Participants mentioned factors that played a role in driving lifestyle but not directly related to knowledge and awareness of CHD. These include job requirements and cultural and environment factors. Job descriptions and activity differed between socioeconomic groups in the current study. LSES participants such as labourers reported leading a more physically active lifestyle, whereas professionals reported leading a more sedentary lifestyle due to their job pattern. Furthermore, LSES participants walk home from their work place to save transport costs, which can be regarded as another socioeconomic factor. However, LSES participants did score lower on knowledge and awareness about CHD and it is interesting that neither group spent substantial time in physical activity out of work. Participants of LSES were less likely to consume fast food, once again due to financial limitations. On the other hand, HSES participants did so due to lack of time to prepare food and financial ability to afford dining in restaurants. Diet was also considerably affected by cultural and financial factors. Participants did not consume enough fruit due food adulteration, which could be considered as environmental factor. As a result, knowledge and awareness alone are not sufficient to modify lifestyle practices, and other contributing factors should be kept in mind to explain lifestyle practices. Hence, as a single predictor of lifestyle practice, neither SES, nor knowledge and awareness, were able to predict lifestyle practice in the multiple regression models. These findings require further research to determine how they can be modified in future by possibly providing safer communities that allow more exercise and increasing advertisements indicating the adverse effects of smoking and the benefits of consuming vegetables and fruit. The latter is difficult to achieve because of food adulteration and may require government intervention to change nutritional standards. Bangladesh also has a high level of grain consumption compared with
developed nations. Public education may be required to achieve a more balanced diet, including lowering salt and sugar consumption.

5.9 Limitations of this study

This study is not without limitations. First, the methodological design was limited as a cross-sectional study including correlation analysis does not address causality. For instance, there was no relation between CHD knowledge and awareness with lifestyle practices; however, because of the study design this cannot be explained. Therefore, a longitudinal study is planned to address this and determine whether knowledge and awareness might or might not contribute lifestyle practice. This is an important health factor because, worldwide, how health promotion and health education programs are delivered to improve knowledge and awareness among the target groups will contribute to whether the specific target group will modify their lifestyle behaviours. If knowledge and awareness are not causal factors for lifestyle modification, different approaches need to be sought.

Another limitation was participant selection, which differed between the two SES groups. Participants of HSES were selected based on their workplace and LSES participants were selected based on their residence. As a result, the majority of the study participants of HSES were men due to gender inequality in employment in Bangladesh. The HSES participants were not recruited on the basis of their place of residence because, as discussed in Chapter 3, HSES people’s residences were located in secured places, so it would have been difficult to access their houses.

There were some limitations obtaining medical information either because of lack of knowledge by participants to report medical information including reporting bias and not collecting public hospital data although it might have been available. This latter option is difficult in the setting of Bangladesh especially for LSES people who do not have the same level of access to health care. Although sugar levels and blood pressure was measured, ECG recording and point-of-care testing of cholesterol and kidney function were not considered due to financial constraints of the project and the logistics of undertaking these measurements. It is envisaged that the current findings and further discussions with research centres in Bangladesh may lead to a follow-up study that will include these factors.
The scoring procedure for CHD knowledge, awareness, and lifestyle was not statistically validated and requires reviewing to explore different weightings given to some factors such as smoking versus tobacco chewing or cessation of smoking. Nonetheless, the scores give reasonable estimates of the degree of CHD knowledge, awareness, and lifestyle practices, and some scores were based on procedures that were similar to those used in Pakistan by Jafri et al. (2005). In addition, using a single CHD knowledge, awareness, and lifestyle practices score may underestimate the overall knowledge and awareness. However, for the purposes of the current study, and based on previous research, the single score for each of the three factors was judged to be sufficient to obtain reasonable estimates for analysis (Jafri et al., 2005; M. S. Khan et al, 2006; Muhamad et al., 2012; Mukattash et al., 2012; Seef et al., 2013; Vaidya et al., 2013). The open-ended questionnaire for knowledge and awareness may have led to underestimating knowledge and awareness level about CHD or may underestimate/overestimate lifestyle behaviours towards CHD as directed questions provide an additional prompt and guidance for participants. However, the participants were given sufficient time to remember and had the question repeated if necessary and rephrased to determine whether they could remember anything in addition to what they had initially indicated.

Finally, due the political crisis at the time of the data collection in Bangladesh it was not possible to collect data from more participants, which initially included recruiting in Chittagong as well and essentially doubling the number of participants. As a result, the selection and random sampling procedures were additional shortcomings and the extrapolation to the Bangladeshi population was not appropriate especially when considering published differences, not only between rural and urban studies but also between regions within a country.

5.10 Implications of this study

This study provides insight about knowledge and awareness about CHD and lifestyle with respect to HSES and LSES people in Bangladesh. The findings provide important information about differences between HSES and LSES people that need to be considered to provide cost-effective health education programs and improve health for the target population group in a developing country such as Bangladesh. This study demonstrates that the current health campaigns may not be addressing specific
differences between HSES and LSES people as, for instance, in antismoking campaigns, which remain ineffective. Government policy makers may benefit from the current results, which will be provided to the main research institute on chronic disease in Bangladesh and inform the government about how to tailor better health campaigns, for instance, by using more appropriate terminology based on education and cultural differences between people of LSES and HSES. In addition, it is clear that health education programs, especially for chronic diseases such as CHD, need to be more comprehensive within formal educational institutions. This study also reveals which areas of knowledge need to be emphasised such as risk factors and symptoms and awareness of one's own risk factors. Prompt identification of CHD symptoms is crucial to reduce the morbidity and mortality due to CHD. In addition, a centralised system of ambulance service is required to improve responses to acute CHD cases. Health education programs also need to address age and gender as this study revealed that the younger age group and LSES females have low CHD knowledge and awareness.

Finally, the study demonstrated that knowledge and awareness of CHD is not sufficient to lead to healthy behaviours and suggests that the government should also address environmental, sociocultural, and socioeconomic factors such as food adulteration, advertising of unhealthy food and beverages, contributing factors for physical inactivity such as lack of secure outdoor places for physical activity, and lessening salt intake. The physiological measures obtained in this research, although not comprehensive, revealed an alarming number of potential new cases of HTN and prehypertension, as well as diabetes and prediabetes, that demands the use of community screening programs and strengthening of those program for early detection of chronic diseases such as HTN, diabetes, high cholesterol, and CHD to reduce the disease burden in a low resource country.

5.11 Recommendations for further research

Based on the findings of this research, there are a number of recommendations for future research. The definition of socioeconomic status is important and needs to be reviewed in the context of Bangladesh in accordance with the current scale of incomes of general people. In addition, an additional middle SES group can be added to a future study to reflect the large proportion of the Bangladeshi population in this stratum. In order to overcome one limitation of this study, a larger, longitudinal study incorporating
both rural and urban areas is recommended in accordance with other studies in this field
to obtain more generalisable findings. The interviewing times can be better adjusted to
allow more family members from the LSES to be present, as well as there being a more
balanced age and gender distribution in HSES and LSES participants. Some of the
questions may have to be reworded as some inadequacies were found with this. For
instance, using more understandable terms instead of dictionary terms for heart disease
is recommended. Some questions may also need to be reviewed for applicability
especially in the awareness sections and how questions are scored or binned to obtain a
final score for knowledge, awareness, and lifestyle practices. In this study, there was no
correlation between knowledge and awareness about CHD with lifestyle practice. As a
result, a further study is necessary to find out why knowledge and awareness about
CHD were not associated with the lifestyle practices among Bangladeshi people in
either socioeconomic group. In addition, reasons for the low level of knowledge and
awareness of risk factors, pathophysiological processes associated with CHD, and
symptoms of CHD need to be further explored.

5.12 Conclusion

Coronary heart disease will continue to be one of the leading causes of death and
increasing incidence of morbidity in the future due to its current upward trend. In this
study, both HSES and LSES groups revealed a lack of knowledge and awareness about
CHD and the deficiencies are poorer among LSES people. However, the lifestyle
practice score was good in both SES groups, but that did not imply that the Bangladeshi
people do not exhibit health-risk behaviours. As indicated above, perhaps due to the
early stage of epidemiological transition of the country, health-risk behaviours might
not be as high as the world estimates and many people exhibit good lifestyle practices.
Nonetheless, the upward trends of health-risk behaviours may worsen the scenario in
future. No association between CHD knowledge and awareness was found with lifestyle
practice that may modify the future incidence of CHD in Bangladesh. Analysis
indicated that, included along with SES, age is the best predictor for CHD knowledge
and lifestyle practice, and gender is related to CHD awareness. Establishment of
targeted, effective, and more extensive health education programs is an obvious need to
improve knowledge and awareness, and, consequently health. Education disparities and
gender imbalance need to be addressed and targeted for HSES and LSES groups as
current education and prevention programs remain ineffective in Bangladesh with
obesity, hypertension, and diabetes on the rise. Body mass index, self-reported previously diagnosed HTN and potential new cases of HTN, and self-reported previously diagnosed diabetes and identification of new cases of diabetes in both groups in the current study indicate room for improvement. The current study is the first to investigate knowledge, awareness, and lifestyle practices related to CHD in HSES and LSES population samples in Bangladesh, and can guide policy makers as well as public health researchers in investigating these problem areas.
REFERENCES


REFERENCES


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REFERENCES


References


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APPENDIX A

Ethics Approval Correspondence

This appendix contains the ethics approval correspondence that was received from the following:

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<th>Research Review Committee of the Centre for the Control of Chronic Diseases at the International Centre for Diarrheal Diseases and Research, Bangladesh (ICDDDR, B)</th>
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18 February 2013

Ms Nilshat E-Sharmin Trisha
C/- Dr. Dewan Shamsul Alam
Head, NCD Unit
Chronic Disease Epidemiology and Genetics
CCCD, ICDDR, B, Mohakhali, Dhaka – 1212
BANGLADESH

Dear Ms Trisha,

Thank you for the additional information forwarded in response to a request from the Human Research Ethics Committee (HREC).

The CSU HREC reviews projects in accordance with the National Health and Medical Research Council’s National Statement on Ethical Conduct in Research Involving Humans.

I am pleased to advise that your project entitled “Awareness and Knowledge and Lifestyle Practices related to Coronary Heart Disease among people from High Socioeconomic and Low Socioeconomic Groups in Bangladesh: A Comparative Study” meets the requirements of the National Statement; and ethical approval for this research is granted for a twelve-month period from 18 February 2013.

The protocol number issued with respect to this project is 2013/025. Please be sure to quote this number when responding to any request made by the Committee.

Please note the following conditions of approval:

- all Consent Forms and Information Sheets are to be printed on Charles Sturt University letterhead. Students should liaise with their Supervisor to arrange to have these documents printed;
- you must notify the Committee immediately in writing should your research differ in any way from that proposed. Forms are available at: http://www.csu.edu.au/_data/assets/word_doc/0010/176833/ethicアプリケーション.doc
- you must notify the Committee immediately if any serious and or unexpected adverse events or outcomes occur associated with your research, that might affect the participants and therefore ethical acceptability of the project. An Adverse Incident Form is available from the website: as above;

www.csu.edu.au

CRICOS Provider Numbers for Charles Sturt University are 00007F (NSW), 01987D (VIC) and 029803D (ACT). ABN: 60 070 705 531
• amendments to the research design must be reviewed and approved by the Human Research Ethics Committee before commencement. Forms are available at the website above;
• if an extension of the approval period is required, a request must be submitted to the Human Research Ethics Committee. Forms are available at the website above;
• you are required to complete a Progress Report form, which can be downloaded as above, by 18 February 2014 if your research has not been completed by that date;
• you are required to submit a final report, the form is available from the website above.

YOU ARE REMINDED THAT AN APPROVAL LETTER FROM THE CSU HREC CONSTITUTES ETHICAL APPROVAL ONLY.

If your research involves the use of radiation, biological materials, chemicals or animals a separate approval is required from the appropriate University Committee.

The Committee wishes you well in your research and please do not hesitate to contact the Executive Officer on telephone (02) 6338 4628 or email ethics@csu.edu.au if you have any enquiries.

Yours sincerely

Julie Hinds
Executive Officer
Human Research Ethics Committee
Direct Telephone: (02) 6338 4628
Email: ethics@csu.edu.au
Cc: Dr Herbert Jetnich Associate Professor Megan Smith Dr Desvran Shahrul Asam

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) National Statement on Ethical Conduct in Human Research (2007)
13 April 2016
Ms Nishat E-Sharmin Trisha
School of Community Health
ALBURY CAMPUS

Dear Ms Trisha,

The CSU Human Research Ethics Committee (HREC) operates in accordance with the National Health and Medical Research Council’s *National Statement on Ethical Conduct in Research Involving Humans*.

The HREC has reviewed your report requesting an extension for your research project “*Awareness and Knowledge and Lifestyle Practices related to Coronary Heart Disease among people from High Socioeconomic and Low Socioeconomic Groups in Bangladesh: A Comparative Study*”, protocol number 2013/025 and I am pleased to advise that this request for an extension meets the requirements of the *National Statement*; and an extension for this research is granted for a twelve month period from 13-Apr-16.

Please note the following conditions of approval:

- all Consent Forms and Information Sheets are to be printed on Charles Sturt University letterhead. Students should liaise with their Supervisor to arrange to have these documents printed;
- you must notify the Committee immediately in writing should your research differ in any way from that proposed. Forms are available at http://www.csu.edu.au/research/ethics_safety/human/hrec_managing you must notify the Committee immediately if any serious and or unexpected adverse events or outcomes occur associated with your research, that might affect the participants and therefore ethical acceptability of the project. An Adverse Incident form is available from the website: as above;
- amendments to the research design must be reviewed and approved by the Human Research Ethics Committee before commencement. Forms are available at the website above;
- if an extension of the approval period is required, a request must be submitted to the Human Research Ethics Committee. Forms are available at the website above;
• you are required to complete a Report On Research Project, which can be downloaded as above, by 17/2/2017 if your research has not been completed by that date;
• you are required to submit a final report, the form is available from the website above.

You are reminded that an approval letter from the CSU HREC constitutes **ethical approval only**.

If your research involves the use of radiation, biological materials or chemicals separate approval is required from the appropriate University Committee.

Please don’t hesitate to contact the Executive Officer: telephone (02) 6338 4628 or email ethics@csu.edu.au if you have any enquiries about this matter.

Yours sincerely,

Regan McIntosh
Executive Officer
Human Research Ethics Committee
Direct Telephone: (02) 6338 4628
Email: ethics@csu.edu.au

Cc: Dr Herbert Jelinek Associate Professor Megan Smith Dr Dewan Shamsul Alam

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This HREC is constituted and operates in accordance with the National Health and Medical Research Council’s (NHMRC) *National Statement on Ethical Conduct in Human Research (2007)*
17 July 2014

To: Dr. Dewan S. Alam
   Principal Investigator of research protocol # PR-14071
   Centre for Control of Chronic Diseases (CCCCD)

From: Abbas Bhuyia, Ph.D.
   Chairperson
   Research Review Committee

Sub: Approval of research protocol # PR-14071

Thank you for your memo dated 17 July 2014 requesting for approval of your research protocol # PR-14071 titled "Awareness and knowledge and lifestyle practices related to coronary heart disease (CHD) among people from high socioeconomic and low socioeconomic groups in Bangladesh: A comparative study" waiving normal RRC review process since this is a student protocol and devoeged as part of your PhD programme. The protocol was also reviewed and approved by the Human Research Ethics Committee of Charles Sturt University, Australia. I have the pleasure to approve the protocol and you are advised to proceed the implementation of the research protocol subject to the approval by the Ethical Review Committee (ERC).

Terms of approval

1. The research protocol is approved for 12-month period from the date of approval of the protocol by the Ethical Review Committee. Approval for further continuation of the research work, if needed, shall be obtained before expiration of the initial approval.

2. You should notify the IRB Secretariat of the start date of the protocol for updating in the integrated navigation system. The protocol start date will not be updated in the navigation system until receiving information from you. Therefore you will not be able to operate budget code and continue spending funds under the research protocol.

3. The RRC approval shall automatically be revoked after one year if the protocol is not started. After one year, you shall have to seek approval for revalidation of the protocol by the RRC & ERC before starting the protocol.

4. This approval is only valid whilst you hold a position at icddr,b; and in the event of your departure from the Centre, a new Principal Investigator will be designated for the research protocol.

5. You should notify the RRC and the ERC immediately of any serious or unexpected adverse effects on participants or unforeseen events that might affect continued acceptability of the protocol.
6. Any changes to the research protocol require the submission (in prescribed form) and approval of an amendment/addendum. Substantial variations may require a new protocol.

7. Continued approval of this protocol is dependent on your periodically updating the Centre’s database for the protocol to show the progress; and a final report/completion report should be submitted at the conclusion of the protocol.

8. You shall submit a report for time extension of the protocol (in prescribed form) if you are unable to complete the protocol activities within the time mentioned in the protocol.

9. You are responsible for systematic storage and retention of the original data pertaining to the research protocol; and the ownership of data after certain period shall be determined as per Centre’s rules and regulations.

10. The RRC should be notified if the protocol is discontinued before the expected date of completion.

I wish you all the success in conducting the research protocol.

Thank you.

Copy: - Director, CCCD
16 September 2014

To: Dr. Dewan S. Alam
   Principal Investigator of research protocol # PR-14071
   Centre for Control of Chronic Diseases (CCCD)

From: Professor K Z Mamun
   Chairman
   Ethical Review Committee (ERC)

Sub: Approval of research protocol # PR-14071

Approval Date: 16 September 2014
Expiration Date: 15 September 2015
Review Type: Expedited Review
Risk Level: No more than minimal
Project type: New Project

Thank you for your memo dated 23 July 2014 requesting for expedited review and approval of your research protocol # PR-14071 entitled "Awareness and knowledge and lifestyle practices related to coronary heart disease (CHD) among people from high socioeconomic and low socioeconomic groups in Bangladesh: A comparative study" and subsequent memos dated 14 September 2014 attaching the modified version addressing the issues raised by the reviewer to the satisfaction of the Committee. Accordingly, the Committee approved the research protocol. I have pleasure to inform you that your above protocol is approved through expedited review mechanism. You will be required to observe the following terms and conditions in implementing the research protocol:

1. The research protocol is approved for 12-month period from the date of approval of the protocol by the Ethical Review Committee. The Federal regulations require review of an approved study not less than once per 12-month period. To comply with federal regulations, a continuing review application must be submitted to the IRB Secretariat for this study to continue beyond 15 September 2015.

All necessary materials for continuing review must be reviewed with sufficient time for review and issuing continued approval before the expiration date. Failure to initiate a continuing review application in a timely fashion may result in discontinuation of study activities until approval can be renewed. Performing study activities, including data analysis, beyond the expiration date results in noncompliance of federal regulations.

2. The ERC approval shall automatically be revoked after one year if the protocol is not started. After one year, you shall have to seek approval for revalidation of the protocol by the ERC before starting.

3. You should notify the IRB Secretariat of the start date of the protocol for updating in the integrated Navision system. The protocol start date will not
be updated in the Navision system until receiving information from you. Therefore you will not be able to operate budget code and continue spending funds under the research protocol.

4. As Principal Investigator, the ultimate responsibility for scientific and ethical conduct including the protection of the rights and welfare of study participants vest upon you. You shall also be responsible for ensuring competence, integrity and ethical conduct of other investigators and staff directly involved in this research protocol.

5. You shall conduct the study in accordance with the ERC-approved protocol and shall fully comply with any subsequent determinations by the ERC.

6. You shall obtain prior approval from the Research Review Committee and the ERC for any modification in the approved research protocol and/or approved consent form(s), except in case of emergency to safeguard/eliminate apparent immediate hazards to study participants. Such changes must immediately be reported to the ERC Chairman.

7. You shall recruit/enrol participants for this study strictly adhering to the criteria mentioned in the research protocol.

8. You shall obtain legally effective informed consent (i.e. consent should be free from coercion or undue influence) from the selected study participants or their legally responsible representative, as approved in the protocol, using the approved consent form prior to their enrolment in this study. Before obtaining consent, all prospective study participants must be adequately informed about the purpose(s) of the study, its methods and procedures, and also what would be done if they agree and also if they do not agree to participate in the study.

9. They must be informed that their participation in the study is voluntary and that they can withdraw their participation any time without any prejudice. Signed consent forms should be preserved for a period of at least five years following official termination of the study.

10. You shall promptly report the occurrence of any Serious Adverse Event or unanticipated problems of potential risk to study participants or others to the ERC in writing within 24 hours of such occurrences.

11. Any significant new findings, developing during the course of this study that might affect the risks and benefits and thus influence either participation in the study or continuation of participation should be reported in writing to the participants and the ERC.

12. You shall report progress of research to the ERC for continuing review of the implementation of the research protocol as stipulated in the ERC Guidelines. Relevant excerpt of ERC Guidelines and 'Annual/Completion Report for Research Protocol involving Human Subjects' are attached for your information and guidance.

13. Data and/or samples should be collected and interviews should be conducted, as specified in the ERC-approved protocol, and confidentiality must be maintained. Data/samples must be protected by reasonable security, safeguarding against risks such as their loss or unauthorized access, destructions, used by others, and modification or disclosure of data. Data/samples should not be disclosed, made available to or use for purposes other than those specified in the protocol, and shall be preserved for a period, as specified under Centre’s policies/practices.
14. You shall promptly and fully comply with the decision of the ERC to suspend or withdraw its approval for the research protocol.

15. The ERC should be immediately notified if the protocol is discontinued before the expected date of completion.

Approved documents:

a. Protocol version no. 1.00, dated 17 July 2014
b. English and Bangla Informed Written Consent Form, version no. 1.0, dated 1 October 2012.
c. English and Bangla questionnaire, version no. 1.0, dated 1 October 2012.

The IRB of icddr,b shall take into account the regulations of the Bangladesh Medical Research Council (BMRC), WHO, international guidelines for biomedical research as laid down by the Council of International Organization of Medical Sciences (CIOMS), the Declaration of Helsinki in relation to biomedical research involving human participants, ICH Guidelines on Good Clinical Practice (GCP), National Institutes of Health (NIH), National Institute of Allergy and Infectious Diseases (NIAID), and Division of Microbiology and Infectious Diseases (DMID). If there is any new declaration involving human participants, contents of such declaration should be appropriately adhered to and the applicable laws and policies of the local government.

I wish you success in running the above-mentioned study.
APPENDIX B

Information Material and Consent Forms

This appendix contains the information material and consent forms that were used with the participants in this research.

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বাংলাদেশের শহুরে জনগোষ্ঠীর হুড়রাগে সংক্রান্তআরোগ্য সমস্যা এবং আচরণগত বৈশিষ্ট্যসমূহ

তথ্য সম্বন্ধিত পাতা (বাংলা)

বাংলাদেশের শহুরে জনগোষ্ঠীর হুড়রাগে সংক্রান্তআরোগ্য সমস্যা এবং আচরণগত বৈশিষ্ট্যসমূহের গবেষণার অংশগ্রহণের জন্য আপনি আমন্ত্রিত। এই গবেষণাটি পরিচালনা করছেন নিষাদ-ই-শারমিন তুর্ক (প্রধান গবেষক এবং পি এইচ ডি শিক্ষার্থী, চার্লস স্টার্ট ইউনিভার্সিটি), সহযোগী অধ্যাপক যশোর জেলার (গবেষণা সুপারভাইজার এবং সহযোগী অধ্যাপক), বায়া মেডিকেল সাইনস, চার্লস স্টার্ট ইউনিভার্সিটি), সহযোগী অধ্যাপক মেগান বিথ (গবেষণা সহ সুপারভাইজার এবং সুফি অফ কমিউনিটি হেলথ প্রধান) এবং ডক্টর দেওয়ান শামসুল আলম (গবেষণা সহ সুপারভাইজার এবং ভারপ্রাপ্ত পরিচালক, সি সি ডি এবং সমস্তকর্মী, ক্রনিক ডিজিস এপিডেমিওলজি এন্ড জেনেজিস, সি সি ডি, আই সি ডি ডি আর বি)।

গবেষণায় অংশগ্রহণকারী হিসেবে আপনার কাছ থেকে প্রত্যাশা

আপনি যদি এই গবেষণায় অংশগ্রহণ ইচ্ছুক হারেন তাহলে আপনাকে কিছু প্রশ্ন করা হবে এবং কিছু পরীক্ষা করা হবে যা প্রায় ৪৫ মিনিট সময় নিবে। এই পরীক্ষাগুলো হচ্ছে বোধ মাস ইনডেক্স (বি এম আই), কোমরের পরীক্ষা, রক্তচাপ নির্ণয়, হৃদপন্থী পর্যবেক্ষণ এবং রক্তে গ্লুকোজ মাত্রা নির্ণয়। প্রত্যেক পরিকল্পনার বর্ণনা নিচে দেওয়া হলো।

১. প্রশ্নালী: আমরা আপনাকে আর্থ সামাজিক অবস্থা, জনসংখ্যা তত্ত্ব, হ্রদরোগ সম্পর্কিত জ্ঞান, সমস্ত এবং জীবন্তার যেমন, খাবার, দুধপান এবং দৈহিক কার্যক্রম, মেডিকেল / বাগান সম্পর্কিত তথ্য এবং ওষধের ব্যবহার সম্পর্কে কিছু প্রশ্ন করা হবে।

২. বি এম আই: আপনার বি এম আই পরিমাপের জন্য একটি টেপ মেজার (পরিমাপক ফিতা) দিয়ে আপনার উচ্চতা এবং ওজনের মেশিন দিয়ে আপনার ওজন মাপা হবে।

৩. কোমরের পরীক্ষা: একটি টেপ মেজার (পরিমাপক ফিতা) দিয়ে আপনার কোমরের পরীক্ষা মাপা হবে।

৪. রক্তচাপ: বসা অবস্থায় দুই বার আপনার রক্তচাপ নির্ণয় করা হবে।
রাবার কাফের কারণে আপনি হয়তো আপনার বাহুতে কিছুটা চাপ অনুভব করতে পারেন কিন্তু সেটা খুব বেশি হবে না। যদি আপনি আপনার হাতে খুব বেশি চাপ অনুভব করেন তাহলে দয়া করে গবেষককে জানানেন যেন তিনি রাবার কাফেটি খুলে ফেলতে পারেন।

৫. রেখা গ্লুেকোজের মাধ্যমে নির্ণয়: এই পরীক্ষার জন্য আপনার আঙ্গিল ফুটায় কয়েক ফোটা রক্ত নেয়া হবে।

এই কারণে হয়তো আপনার অল্প রক্তপত্ত হতে পারে কিন্তু সেজন্য বাংলা এইড ব্যবহার করা হবে। এই পদ্ধতির কারণে আপনি যদি কোনো অস্বগ্ন বোধ করেন তাহলে গবেষককে জানানেন।

• আপনি যদি প্রত্যাশিত পর্যায়ের চেয়ে বেশি অস্বস্তি বোধ করেন তাহলে আপনি গবেষণা থেকে যে কোনো সময়ে বের হয়ে যেতে পারেন।
• আপনার যদি সামাপ্তিক সময়ে পরীক্ষাগুলো করে থাকেন এবং ফলাফলগুলি আপনার কাছে থাকে তাহলে আপনাকে পরীক্ষা গুলো করা হবে না।
• সবগুলো পরীক্ষা উচ্চ আর্থসামাজিক গোষ্ঠের জন্য অফিসের একটি নিদিষ্ট ঘর এবং নিয় আর্থসামাজিক গোষ্ঠের জন্য তাদের বাসায় করা হবে।

বিশেষ স্থলাক্ত: আপনার যদি টেপ এলকোহল ওয়াইপ, এবং ল্যাটেক্স এ এলাজি থাকে অনুগ্রহ করে আমদের জানানেন

পরীক্ষার ফলাফল

পরীক্ষার ফলাফলগুলো পরীক্ষা করা শেষ হলে আপনাকে ব্যাখ্যা করা হবে। এটা লক্ষ্য করা প্রয়োজন যে ফলাফল যদি স্বাভাবিকের চেয়ে কিছুটা বিচ্যুত হয় তবে তার মানে এই না যে কোনো সমস্যা আছে। তথ্য যদি কোনো ফলাফল স্বাভাবিকের চেয়ে বিচ্যুত হয় তাহলে আপনাকে ডাক্তারের সাথে আলোচনা করার পরামর্শ দেওয়া হবে। আমারা আপনার পরীক্ষার ফলাফলগুলোর একটি অনুবলিপি দিব এবং তার সাথে একটি চিঠি দিয়ে যেন আপনি আপনার ডাক্তারের সাথে পরামর্শ করতে পারেন।

আমরা আপনার পরীক্ষার ফলাফলগুলো দিয়ে কি করব?

আপনার পরীক্ষার ফলাফলগুলোর গোপনীয়তা আমদের কাছে গুরুত্বপূর্ণ। এই কারণে, সব ফলাফল গুলো এমন ভাবে সংরক্ষণ করা হবে যেন আপনারার পরিচয় গোপন থাকে। আপনার নাম এবং তথ্যসহ এমন কিছু প্রকাশ করা হবে না যার দ্বারা আপনাকে চিহ্নিত করা যায়।

এই গবেষণার তথ্যের সাহায্যে এই গবেষণার গবেষকদের দ্বারাই ব্যবহৃত হবে। এই গবেষণা থেকে উদ্ভূত যেকোনো প্রকাশনা আপনার গোপনীয়তা বজায় রাখে। যখন হস্তপদ পর্যবেক্ষনের একটি ছোট অংশ প্রকাশিত হবে, আমারা আপনাকে নিশ্চিত করব যে হস্তপদ পর্যবেক্ষনের এই অংশ থেকে কোনো ভাবেই আপনাকে সনাতন করা যাবে না। এই গবেষণা থেকে সৃষ্টি হওয়া সমৃদ্ধ ভবিষ্যতে অন্য কোনো গবেষণায় অন্য গবেষকদের দ্বারা ব্যবহৃত হতে পারে। পরবর্তীকালীন গবেষকরা সুধূরাত্ম গবেষণার সেই সমস্ত উপাদানকে প্রবেশাধিকার পাবে যেগুলিতে আপনাকে সনাতন করা যায় এমন উপাদান সরিয়ে ফেলা হয়েছে।

এটা লক্ষ্য করা প্রয়োজন যে, এই গবেষণায় যে পরীক্ষাগুলো করা হবে তা এই গবেষনারই অংশ এবং এটাকে কোনমাত্র স্বাভাবিক সেবা হিসাবে বিবেচনা করা যাবে
না। তথ্য সংগ্রহের সময় আপনাকে যে পরীক্ষাগুলোর ফলাফল দেওয়া হবে তাও এই
গবেষনারই অংশ, এটা রোগ নির্ণয়ের জন্য নয়। যখন আপনাকে আপনার
পরীক্ষাগুলোর ফলাফল এবং এর স্বাভাবিক মাত্রা থেকে বিচ্যুতি সম্পর্কে জানানো হবে
তখন আপনাকে কোনো স্বাভাবিক পরম্পরা দেওয়া হবে না। যখন আপনার পরীক্ষাগুলোর
ফলাফল স্বাভাবিক চেয়ে বিচ্যুত হবে, আপনাকে আপনার ভাড়ারের সাথে পরামর্শ
করার জন্য বলা হবে।

এই গবেষণায় আপনার অংশগ্রহণ সম্পূর্ণভাবে আপনার ইচ্ছাকৃত। আপনি যদি চান যেকোনো
সময় আপনার অংশগ্রহণ বাতিল করতে পারেন।

বিষয়: চার্লস স্টার্ট ইউনিভার্সিটির হিউম্যান রিসার্চ ইথিক্স কমিটি এবং বাংলাদেশের আই সি ডি
উই আর বির রিসার্চ ইথিক্স বোর্ড এবং ইথিক্স রিভিউ বোর্ড এই গবেষণায় কেন্দ্রিত করেছে।
আপনার যদি এই গবেষণা সম্পর্কে কোনো কিছু জানার বা অভিযোগ করার থেকে তাহলে
নিম্ন ধরনের যোগাযোগ করতে পারেন।

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</tr>
<tr>
<td>বাংলাদেশ, নিউ সাউথ ওয়েলস ২৭৯৫</td>
</tr>
<tr>
<td>অস্ট্রেলিয়া</td>
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<tr>
<td>ফোন: +৬১ ৬৩৩ ৮৪৬২৮</td>
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<tr>
<td>ই মেইল: <a href="mailto:ethics@csu.edu.au">ethics@csu.edu.au</a></td>
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</table>

অথবা

ডকটর দেওয়ান শামসুল আলম
ভারপ্রাপ্ত পরিচালক, সি সি সি ডি এবং
সমস্তকর্মী, ক্রান্তিক ডিজিস, এপিডেমিওলজি এন্ড জেনেটিক্স,
সি সি সি ডি, আই সি ডি ডি আর বি,
মহাখালী, ঢাকা ১২১২,
বাংলাদেশ |
| ফোন: +৮৮০২৮৮৬০৫২-৩২ একটেনশন ২২০৯(অফিস) |
| মোবাইল ফোন: +৮৮ ০১৭১৩০৬০৫০ |
| ই মেইল: dsalam@icddrb.org |
বাংলা দেশের শহরে জনগণের হুমকিতে সংক্রান্ত আর্থেস মডেল, জ্ঞান সমৃদ্ধি এবং আচরণের বৈশ্বিক সম্পর্ক

সমন্বিতকৃত (বাংলা)

<table>
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<tr>
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<th>প্রধান গবেষণা সুপারভাইজার</th>
<th>গবেষণা সহ সুপারভাইজার</th>
<th>গবেষণা সহ সুপারভাইজার</th>
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<td>সহযোগী অধ্যাপক মেগান মিথ</td>
<td>ডক্টর দেওয়ান শামসুল আলম</td>
</tr>
<tr>
<td>+৬১২ ৬০৫ ১৯২৬৬ (অস্ট্রেলিয়া)</td>
<td>+৬১২ ৬০৫ ১৯২১৯ (অস্ট্রেলিয়া)</td>
<td>+৬১২ ৬০৫ ১৯২৪৫ (অস্ট্রেলিয়া)</td>
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<td>+৮৪০১৮০১১৮৩৩১ ৬ (বাংলাদেশ)</td>
<td><a href="mailto:ntrisha@csu.edu.au">ntrisha@csu.edu.au</a></td>
<td><a href="mailto:hjelinek@csu.edu.au">hjelinek@csu.edu.au</a></td>
<td><a href="mailto:dsalam@icddrb.org">dsalam@icddrb.org</a></td>
</tr>
</tbody>
</table>

১. আমি ....................................................................................................................... 'বাংলা দেশের শহরে জনগণের হুমকিতে সংক্রান্ত আর্থেস মডেল, জ্ঞান সমৃদ্ধি এবং আচরণের বৈশ্বিক সম্পর্ক' গবেষণা প্রকল্পে অংশগ্রহণের সম্মতি দিচ্ছি।

২. আমি বুঝি যে যেকোনো সময় এই গবেষণা থেকে আমি আমার অংশগ্রহণ বাতিল করতে পারি।

৩. এই গবেষনার উদ্দেশ্য আমার কাছে ব্যাখ্যা করা হয়েছে এবং, এই গবেষনার তথ্য সম্পর্কে প্রাতাতি আমি পড়েছি এবং বুঝেছি।

৪. এই গবেষনার অংশ হিসেবে আমি প্রথম গবেষককে আমার রক্তচাপ, রক্তে গ্লুকোজের পরিমাণ, কোমরের পরিদি এবং বি এম আই পরিমাপের জন্য অনুমর্ন দিয়েছি।

৫. আমি বুঝি যে আমার যেকোনো তথ্য অথবা ব্যক্তিগত বিবরণ এই গবেষণা চলাকালে গোপন রাখা হবে এবং আমার লিখিত অনুমর্ন ছাড়া আমার নাম বা অন্য কোনো সনাক্তকরণ তথ্য প্রকাশিত করা হবে না।

৬. আমি বুঝি যে এই গবেষণা চলাকালে যেকোনো তথ্য হয়ে পরবর্তীকালীন কোনো গবেষণায় প্রকাশিত হতে পারে।

৭. আমি বুঝি যে যত সম্পর্কের সময় আমাকে যে পরিকল্পনা ফলাফল দেওয়া হবে তা এই গবেষনারই অংশ, এটা রোগ নির্যাতের জন্য নয়।
চার্ল্স স্টার্ট ইউনিভার্সিটির হিউম্যান রিসার্চ ইথিক্স কমিটি এবং বাংলাদেশের আই সি ডি ডি আর বির রিসার্চ রিভিউ বোর্ড এবং ইথিক্স রিভিউ বোর্ড এই গবেষণাকে অনুমোদন দিয়েছে। আমার যদি এই গবেষণা সম্পন্ন করার কিছু জানার বা অভিযোগ করার থাকে তাহলে আমি নিম্নোক্ত ঠিকানায় যোগাযোগ করতে পারি।

নির্বাহী কর্মকর্তা
হিউম্যান রিসার্চ ইথিক্স কমিটি
অধ্যায়ন বিষয়ক নিয়মগুলি কার্যালয়
চার্ল্স স্টার্ট ইউনিভার্সিটি
প্যানেরোমা এভিনউ
বাথার্ট, নিউ সাউথ ওয়েলস ২৭৯৫
অস্ট্রেলিয়া
ফোন: +৬১ ৬৩৩ ৮৪৬২৮
ইমেইল: ethics@csu.edu.au

অধ্বর
ডক্টর দেওয়ান শামসুল আলম
ভারপ্রাপ্ত পরিচালক, সি সি সি ডি এবং
সমবয়স্ক রোগ, ক্রিয়াকর্ম ইভিজিস এপিডেমিওলজি এন্ড জেনেটিক, সি সি সি ডি, আই সি ডি ডি আর বি,
মহাখালী, ঢাকা ১২১২,
বাংলাদেশ
ফোন: +৮৮০২৮৭৩০৫২৩-৩২ এক্সটেনশন ২২০৯(অফিস)
মোবাইল ফোন: +৮৮০১৭১৩০৯৩৮৭০
ইমেইল: dsalam@icddrb.org

..............................................................
অংশগ্রহনকারীর স্বাক্ষর
নাম: ..............................................................
ফোন নম্বর: ..............................................................

..............................................................

Title: Socioeconomic, Cognitive, and Behavioural Variables Concerning Coronary Heart Disease from the Urban Population of Bangladesh

Information Sheet (English)

You are invited to participate in a research project investigating ‘Socioeconomic, Cognitive, and Behavioural Variables Concerning Coronary Heart Disease from the Urban Population of Bangladesh’. This study is being conducted by Nishat-E-Sharmin Trisha (Chief Investigator and PhD student at Charles Sturt University), Associate Professor Herbert Jelinek (Research Supervisor and Senior Lecturer Biomedical Science in Charles Sturt University), Associate Professor Megan Smith (Research co-supervisor and Acting Associate Dean, Faculty of Science) and Dr. Dewan Shamsul Alam (Research co-supervisor and Head, NCD Unit Chronic Disease Epidemiology and Genetics CCCD, ICDDR, B).

What does your participation involve?

If you agree to participate in this research you will be asked several questions from a valid questionnaire and to undertake a series of tests that will take approximately 45 minutes to complete. These tests include: Body mass index (BMI), waist circumference, blood pressure, and blood glucose level (BGL). Each test is detailed below.

1. **Questionnaires:** involve questions about your knowledge and awareness about coronary heart disease (CHD) including your lifestyle behaviour, general medical history and medications, use of alternative medication.

2. **BMI:** To measure your BMI your height will be measured by human height measurement scale and weight will be measured by electronic human weighing machine. You will not experience any kind of discomfort during measurement of your height and weight.

3. **Waist circumference:** A tape measure will be used to measure the waist circumference. You will not experience any kind of discomfort during measurement of your waist.

4. **Blood pressure:** Blood pressure will be recorded in a sitting position and calculated two times. A rubber cuff will be placed on your arm and will be inflated by a squeezable bulb. The round end of stethoscope will be placed under the cuff to hear the sounds.
You may feel slight pressure on your arm because of inflated rubber cuff but it will not too much. If you feel too much pressure on your arm, please let the investigator know as she can put off the rubber cuff.

5. **BGL**: Finger prick test will be done for identifying BGL

Finger prick test may cause of little amount of bleeding but band aid will be used for this. Bleeding will not be too much. If you feel any discomfort in this procedure you will let the investigator know.

- If you experience more than the expected level of discomfort, you may even withdraw your participation.
- Tests will not be done if they have recently been carried out and the result is available.
- All tests will be done in a particular room in an office for high socioeconomic group of people and at home for low socioeconomic group of people.

**NB**: Please notify us if you have allergy to tapes, alcohol wipes, latex.

**Test results**

Test results will be explained to you at the end of your session. It is important to note that some deviations from standard results do not indicate that there is a problem. However, you will be advised to seek the advice of your doctor if any result deviates from normal. We will give you a copy of your results and a letter to take with you to your consultation with your doctor.

**What will we do with your test results?**

Confidentiality of your results is important to us. Therefore, all test results will be stored such that your identity is protected, i.e., data will not have identifying information included and a code will be used to identify your data.

The data from this research project will be used by researchers involved in this research project to evaluate the level of knowledge and awareness of CHD among the high socioeconomic and low socioeconomic group of people living in slums of Bangladesh. Any publications that arise from this research project will maintain your confidentiality. Whilst a small section of a heart rate recording may be published we will ensure that you cannot be identified from this section of heart rate recording. The data collected in this research project may be used in future research with other researchers. Future researchers will only have access to material that has had all identifying material removed.

**It is important to note that the tests are conducted as part of a research project and should not be considered in any way to constitute provision of health care. Feedback provided to you consists of data collected as part of the research project**
and is not a clinical diagnosis. Whilst you will be informed of your test results and given information regarding deviation of these results from normal levels, no health advice can be given to you by the researchers. Whenever test results deviate from normal participants will be asked to seek health advice from their doctor.

Your participation in this research project is entirely voluntary. You are free to withdraw your consent and withdraw from the research project at any time you wish.

NOTE: Charles Sturt University’s Ethics in Human Research Committee and the Research Review Committee (RRC) and Ethical Review Committee (ERC) of the ICDDR, B have approved this study. If you have any complaints or concerns about this research, you may contact

Executive officer
Human Research Ethics Committee
Office of Academic Governance
Charles Sturt University
Panorama Avenue
Bathurst NSW 2795
Phone: +61 (02) 6338 4628
Email: ethics@csu.edu.au

OR

Dewan Shamsul Alam.
Associate Scientist & Head, NCD Unit
Chronic Disease Epidemiology and Genetics
CCCD, icddr,b, Mohakhali, Dhaka – 1212, Bangladesh
Telephone +880 2 886 0523-32 Ext 2209 (Work)
+880 1713 093870 (Mobile)
Email: dsalam@icddrb.org

Any issues you raise will be treated in confidence and investigated fully and you will be informed of the outcome.
Title: Socioeconomic, Cognitive, and Behavioural Variables Concerning Coronary Heart Disease from the Urban Population of Bangladesh

Consent Form

<table>
<thead>
<tr>
<th>Chief investigator</th>
<th>Principle supervisor</th>
<th>Co-supervisor</th>
<th>Co-supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nishat-E-Sharmin</td>
<td>Associate Professor</td>
<td>Associate Professor</td>
<td>Dr. Dewan Shamsul Alam</td>
</tr>
<tr>
<td>Trisha</td>
<td>Herbert Jelinek</td>
<td>Megan smith</td>
<td></td>
</tr>
<tr>
<td>+612 605 19266</td>
<td>+612 605 19219</td>
<td>+612 605 19245</td>
<td>+880 2 886 0523-32 Ext 2209 (Bangladesh)</td>
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<tr>
<td>+8801671171412</td>
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<td><a href="mailto:hjelinek@csu.edu.au">hjelinek@csu.edu.au</a></td>
<td><a href="mailto:mesmith@csu.edu.au">mesmith@csu.edu.au</a></td>
<td><a href="mailto:dsalam@icddrb.org">dsalam@icddrb.org</a></td>
</tr>
</tbody>
</table>

1. I, ...........................................consent to my participation in the research project investigating ‘Socioeconomic, Cognitive, and Behavioural Variables Concerning Coronary Heart Disease from the Urban Population of Bangladesh’.
2. I understand that I am free to withdraw my participation in the research at any time.
3. The purpose of the research has been explained to me and, I have read and understood the information sheet.
4. I permit the investigator to perform blood pressure, blood glucose level (BGL), waist circumference and Body mass index (BMI) as part of this project.
5. I understand that any information or personal details gathered in the course of this research about me are confidential and neither my name nor any other identifying information will be used or published without my written permission.
6. I understand that any data gathered in the course of this research may be published and/or used in subsequent research projects.
7. I understand that the feedback provided to me consist of data collected as part of the research project and is not a clinical diagnosis.
8. The Charles Sturt University Human Ethics Committee and, the Research Review Committee (RRC) and Ethical Review Committee (ERC) of the ICDDR, B have approved this study.
I understand that if I have any complaints or concerns about the research I can contact:

Executive officer
Human Research Ethics Committee
Office of Academic Governance
Charles Sturt University
Panorama Avenue
Bathurst NSW 2795

Telephone: +61 (02) 6338 4628
Email: ethics@csu.edu.au

OR

Dr. Dewan Shamsul Alam.
Associate Scientist & Head, NCD Unit
Chronic Disease Epidemiology and Genetics
CCCD, icddr,b, Mohakhali, Dhaka – 1212, Bangladesh

Telephone +880 2 886 0523-32 Ext 2209 (Work)
+880 1713 093870 (Mobile)
Email: dsalam@icddrb.org

----------------------------------------------------------------------------------------
Signature of participant

Name: .................................................................
Date: .................................................................
Phone no: ...........................................................
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APPENDIX C

Clinical History Forms and Questionnaires

This appendix contains the clinical history forms and questionnaires that were used to interview the participants. Here both Bengali and English versions of the clinical history form and the questionnaire are included.

Bangla documents

Clinical history form ................................................................. 214
Questionnaire ........................................................................... 216

English documents

Clinical history form ................................................................. 228
Questionnaire ........................................................................... 230

These documents are formatted differently from the original versions. Alterations were necessary because of page margin constraints that CSU places on theses.
The first page of this material was printed on Charles Sturt University letterhead and also contained the logo for the International Centre for Diarrheal Diseases and Research, Bangladesh.

বাংলা দেশের শহুরে জনগোষ্ঠীর হুদরগো সংক্রনতঃকাে মৃত্যু ক্রমের সম্পর্কে এবং আচরণগত বঁশিক্ষা মাহাত্ম্য

মেডিকেল/স্বাস্থ্য সম্পর্কিত তথ্য (বাংলা)

বয়স:............................................বছর

লিঙ্গ: □ পুরুষ □ মহিলা

আপনার কি কখনো হাতরোগ নিঃসৃত হয়েছে? □ হুঁ □ না

যদি হুঁ হয় তবে কত দিন যাবত?.........................বছর

আপনার কি কখনো ডায়াবেটিস নিঃসৃত হয়েছে? □ হুঁ □ না

যদি হুঁ হয়, তবে কত দিন যাবত?.........................বছর

□ জানা নেই

এবং কত দিন যাবত?..............................বছর

আপনার কি কখনো উচ্চরক্তচাপ নিঃসৃত হয়েছে? □ হুঁ □ না

যদি হুঁ হয়, তবে কত দিন যাবত?.........................বছর

আপনার কি কখনো নিম্নলিখিত সমস্যাগুলো নিঃসৃত হয়েছে/অনুভব করেছেন?

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<td>□ না</td>
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<td>□ না</td>
</tr>
<tr>
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<td>□ হুঁ</td>
<td>□ না</td>
</tr>
</tbody>
</table>

অন্য কোনো মেডিকেল/স্বাস্থ্য সম্পর্কিত তথ্য:
..................................................................................................................................................................................
..................................................................................................................................................................................
ঔষধপ্রয়োগ (প্রথাগত/ফার্মাসিউটিক্যাল)

<table>
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<th>সেবন মাত্রা</th>
<th>অন্য কোনো তথ্য</th>
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স্বাস্থ্যের পরীক্ষা

সমর্থি গ্রহণ করা হয়েছে

পরীক্ষা ১. বি এম আই
উচ্চতা: .......................... মিটার
ওজন: .............................. কেজি
বি এম আই = .......................... কেজি/মিটার

পরীক্ষা ২. কোমরের পরিধি
কোমরের পরিধি..........................সেমি:

পরীক্ষা ৩. রক্তচাপ পরিমাপ
ওঠার সময় মাথা বিমর্শিত করা ☐ হাঁ ☐ না
বসা অবস্থায় (১ মিনিট) × ২  সিস্টলিক / ডায়াস্টলিক
১ম পরিমাপ ........................../..........................মিমি: মার্কারি
২য় পরিমাপ ........................../..........................মিমি: মার্কারি
গড় ..........................................................মিমি: মার্কারি

পরীক্ষা ৪. রক্তে গ্লুকোজের নমুনা
রক্তে গ্লুকোজের পরিমান..........................মিলি মোল/লিটার
কোড নং: __ __ __

তারিখ:

বাংলাদেশের শহরে জনগদ্ধির হুদরা সংক্রান্ত আরুত মজিক, জনসংখ্যায়িত এবং আচরণগত বৈশিষ্ট্যাবলী

প্রশ্নপত্র (বাংলা)
ক বিভাগ: আর্থ-সামাজিক এবং জনসংখ্যাতাত্ত্বিক তথ্য

১. বয়স: ....................... বছর

২. লিঙ্গ: □ পুরুষ □ মহিলা

৩. বৈবাহিক অবস্থা:
□ বিবাহিত □ অবিবাহিত □ বিবাহ/বিবিধ কর্মকর্তা □ তালাকপ্রাপ্ত

৪. আপনি কি আপনার নাম স্বাক্ষর করতে পারেন?
□ হাঁ (৫নম্বর প্রশ্নে যান) □ না (৬নম্বর প্রশ্নে যান)

৫. আপনার সর্বোচ্চ শিক্ষাগত যোগ্যতা কি?
□ কখনও কুলে যাননি □ প্রাথমিক (প্রথম থেকে পঞ্চম শ্রেণী)
□ মাধ্যমিক (ষষ্ঠ থেকে দশম শ্রেণী) □ মাধ্যমিক পাশ
□ উচ্চ মাধ্যমিক পাশ □ মাধ্যমিক পাশ
□ মাধ্যমিক পাশ
□ সাতক্রত
□ সাতক্রত

৬. আপনি কোথায় বসবাস করেন?
□ বাড়ি এলাকা □ আবাসিক এলাকা (যেমন এপার্টমেন্ট)

৭. চাকুরির অবস্থা
□ চাকুরিরত □ বেকার
৮. আপনার পেশা কি?


৯. আপনার পরিবারের আয় কত?

<table>
<thead>
<tr>
<th>পরিবারের আয়</th>
<th>টাকা</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ ১০,০০০</td>
<td></td>
</tr>
<tr>
<td>১০,০০১-৩০,০০০</td>
<td></td>
</tr>
<tr>
<td>&gt; ৩০,০০১-৫০,০০০</td>
<td></td>
</tr>
<tr>
<td>&gt; ৫০,০০০</td>
<td></td>
</tr>
</tbody>
</table>

খ বিভাগ: হাদরোগ সম্পর্কিত জ্ঞান
এখন আমি আপনাকে কিছু প্রশ্ন করব যা আমাকে বুঝতে সাহায্য করবে হাদরোগ সম্পর্কে আপনি কতটুকু জানেন। এগুলো সাধারণ জ্ঞানের প্রশ্ন।

আপনি কি মনে করেন হাদরোগ সমবেদ্ধে আপনার জ্ঞান কতটুকু? (অতিরিক্ত তথ্য)

<table>
<thead>
<tr>
<th>জ্ঞান</th>
<th>টাকা</th>
</tr>
</thead>
<tbody>
<tr>
<td>খুব খারাপ</td>
<td></td>
</tr>
<tr>
<td>খারাপ</td>
<td></td>
</tr>
<tr>
<td>ভালো ও না, খারাপ ও না (মোটামুটি)</td>
<td></td>
</tr>
<tr>
<td>ভালো</td>
<td></td>
</tr>
<tr>
<td>খুব ভালো</td>
<td></td>
</tr>
</tbody>
</table>

রা গবন্সিফ-সংক্রান্ত দিশ

১. আপনি কি মনে করেন বাংলাদেশে মৃত্যুর প্রধান কারণ কি?


২. আপনি কি মনে করেন হাদরোগে কে বা কারা বেশি আক্রান্ত হয়?

<table>
<thead>
<tr>
<th>আক্রান্ত</th>
<th>টাকা</th>
</tr>
</thead>
<tbody>
<tr>
<td>পুরুষ রা</td>
<td></td>
</tr>
<tr>
<td>মহিলা মাসিক বন্ধ হয়ে যাওয়ার আগে</td>
<td></td>
</tr>
<tr>
<td>মহিলা মাসিক বন্ধ হয়ে যাওয়ার পরে</td>
<td></td>
</tr>
<tr>
<td>পুরুষ এবং মহিলা সমান ভাবে আক্রান্ত হয়</td>
<td></td>
</tr>
</tbody>
</table>

৩. আপনি কি মনে করেন হাদরোগ একটি-

<table>
<thead>
<tr>
<th>হাদরোগ</th>
<th>টাকা</th>
</tr>
</thead>
<tbody>
<tr>
<td>স্বল্প মেয়াদি রোগ</td>
<td></td>
</tr>
<tr>
<td>দীর্ঘ মেয়াদি রোগ</td>
<td></td>
</tr>
</tbody>
</table>
রা গবদ্ধি ষ
4. আপনি হ্রদরাগ সমবেদে কি জানেন?
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5. একজন মানুষের যদি হ্রদরাগ হয়, তাহলে তাঁর শরীরে কি ধরনের পরিবর্তন হয় বলে আপনি মনে করেন?
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ঝুঁকিসমূহ
6. কি কি কারণে হ্রদরাগের ঝুঁকি বাড়ে বলে আপনি মনে করেন? (যত গুলি পারেন একটি তালিকা তৈরী করেন)
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7. এই ঝুঁকিসমূহ কিভাবে হ্রদরাগ ঘটায় বলে আপনি মনে করেন?
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8. হ্রদরাগের সবচেয়ে প্রতিরোধযোগ্য ঝুঁকি কি বলে আপনি মনে করেন?
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লক্ষণসমূহ
9. আপনি কি করে বুঝেন যে আপনার কিংবা অন্য কারা হার্ট এটাক হয়েছে কিনা?
...................................................................................................................................................................................
১০. এমন কি হতে পারে যে কারো হ্যাদরেগ হয়েছে কিন্তু সে বুঝতে পারেনি?

☐ হাঁ  ☐ না  ☐ জানা নেই

পর্যর্বক্ষয় ক্ষেত্র

১১. হ্যাদরেগ কি প্রতিরোধ করা যায়?

☐ হাঁ (১২ নম্বর প্রশ্ন যান)
☐ না (১৩ নম্বর প্রশ্ন যান)
☐ জানা নেই (১৪ নম্বর প্রশ্ন যান)

১২. কি করলে হ্যাদরেগ প্রতিরোধ করা যায়?

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১৩. কি কারণে হ্যাদরেগ প্রতিরোধ করা যায় না?

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চিকিৎসা

১৪. হ্যাদরেগের কি চিকিৎসা করা যায়?

☐ হাঁ (১৫ নম্বর প্রশ্ন যান)
☐ না (১৬নম্বর প্রশ্ন যান)
☐ জানা নেই (প বিভাগে যান)

১৫. কিভাবে হ্যাদরেগের চিকিৎসা করা যায়?

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১৬. কেন হ্যাদরেগের চিকিৎসা করা যায় না?

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গ বিভাগ: হ্রদরোগ সম্পর্কিত সচেতনতা

পরের প্রশ্নগুলি আপনার হ্রদরোগ সম্পর্কিত সচেতনতার উপর

নিজের হ্রদমায়ের স্বাস্থ্য

১. আপনার মতে আপনার হ্রদপীড়িত স্বাস্থ্য কেমন?
   □ খুব খারাপ  □ খারাপ   □ ভালো ও না, খারাপ ও না (মোট মুট)
   □ ভালো       □ খুব ভালো  □ বুঝি না

২. আপনি কি আপনার হ্রদপীড়িত স্বাস্থ্য নিয়ে উদ্বিগ্ন?
   □ হ্যা (৩নম্বর প্রশ্ন যান)  □ না (৪ নম্বর প্রশ্ন যান)

৩. কোন ব্যাপারে আপনি বিশেষভাবে উদ্বিগ্ন?
   ..................................................................................................................................................................................
   ..................................................................................................................................................................................

৪. কি কারণে আপনি আপনার হ্রদপীড়িত স্বাস্থ্য নিয়ে উদ্বিগ্ন নন?
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নিজস্ব ঝুঁকিসমূহ

৫. আপনার আছে এমন কোনো নির্দিষ্ট হ্রদপীড়িতের ঝুঁকি সম্পর্কে আপনি কি সচেতন?
   □ হ্যা (৬ নম্বর প্রশ্ন যান)
   □ আমার কোনো ঝুঁকি নেই (৭ নম্বর প্রশ্ন যান)
   □ জানা নেই (৭ নম্বর প্রশ্ন যান)

৬. আপনার নিজের কি কি ঝুঁকি আছে বলে আপনি মনে করেন?
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   ..................................................................................................................................................................................
হ্যাদেরোগ প্রতিরোধে পদক্ষেপ

৭. আপনি হ্যাদেরোগ প্রতিরোধ করার জন্য কি কোনো পদক্ষেপ নিয়েছেন?

□ হ্যাঁ (৮ নম্বর প্রশ্ন যান)  □ না (১০ নম্বর প্রশ্ন যান)

৮. আপনার হ্যান্ডশিরক সুখ রাখার জন্য আপনি কি কোনো পদক্ষেপ নিয়েছেন?

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৯. কি কারণে আপনি আপনার হ্যান্ডশিরক সুখ রাখার পদক্ষেপগুলো নিয়েছেন? (১২ নম্বর প্রশ্ন যান)

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১০. আপনি হ্যাদেরোগ প্রতিরোধ করার জন্য কেন কোনো পদক্ষেপ নেননি?

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১১. হ্যাদেরোগ প্রতিরোধ করার জন্য কোনো পদক্ষেপ না নিলে কি ফলাফল হতে পারে?

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হস্তথারোগ এর সাথে সম্পর্কিত রোগ
12. আপনার কি হাতপিট সম্পর্কিত কোনো রোগের ইতিহাস আছে?
[ ] হ্যাঁ  [ ] না  [ ] জানা নেই

প্রাক-শনাক্ত হস্তথারোগ
13. আপনাকে কি কোনো ডক্টর / স্বাস্থ্য সেবা প্রদানকারী বলেছে যে আপনার হস্তথারোগ আছে?
[ ] হ্যাঁ  [ ] না  [ ] জানা নেই

হস্তথারোগের পরিবারিক ইতিহাস
14. আপনার পরিবারের (যেমন পাপা-মা, চাচাত ভাই-বোন বা স্ত্রী-বালী নয়) কারদের কি হস্তথারোগ আছে?
[ ] হ্যাঁ  [ ] না  [ ] জানা নেই

হস্তথারোগ আছে সম জে এমন করে রস্তায় সাধন করা হয়?
15. আপনি আপনার সমাজের এমন কাউকে চিনেন যার হস্তথারোগ আছে?
[ ] হ্যাঁ  [ ] না  [ ] জানা নেই

হার্ট অ্যাটাকের ঘটনায় ব্যবস্থা গ্রহণ
16. আপনার যদি কখনো মনে হয় যে আপনার হার্ট এটাক হয়েছে প্রথমে আপনি কি করবেন?
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17. আপনার যদি কখনো মনে হয় যে অন্য কারোর হার্ট এটাক হয়েছে প্রথমে আপনি কি করবেন?
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ঘ বিভাগ: হস্তদোষের সাথে সম্পর্কিত জীবনধারার অভ্যাস
এখন আমি আপনাকে কিছু প্রশ্ন করব যা আপনার জীবনধারার অভ্যাসের সাথে সম্পর্কিত।

ধুমপান করা
1. আপনি কি ধুমপান করেন?
   □ হাঁ (২ নম্বর প্রশ্ন যান) □ না (৫ নম্বর প্রশ্ন যান)

2. যদি হাঁ হয়,
   কত বছর?.......................বছর
   প্রতিদিন কয়টি করে?.....................টি
   গত এক বছরের তুলনায়, আপনি কি মনে করেন আপনি আগের চেয়ে বেশি ধুমপান করেছেন, কম ধুমপান করেছেন, অথবা একই হারে ধুমপান করেছেন?
   □ বেশি ধুমপান করছি (৩ নম্বর প্রশ্ন যান)
   □ কম ধুমপান করছি (৩ নম্বর প্রশ্ন যান)
   □ একই হারে ধুমপান করছি (৪ নম্বর প্রশ্ন যান)

3. কেন আপনি আপনার ধুমপানের অবস্থা (হার) পরিবর্তন করেছেন? (৭ নম্বর প্রশ্ন যান)
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4. কেন আপনি আপনার ধুমপানের অবস্থা (হার) পরিবর্তন করেননি? (৭ নম্বর প্রশ্ন যান)
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5. যদি না হয়, আপনি কি কখনো ধুমপান করেছেন?
   □ হাঁ (৬ নম্বর প্রশ্ন যান) □ না (৭ নম্বর প্রশ্ন যান)

6. যদি হাঁ হয়,
   কত বছর?.......................বছর
   প্রতিদিন কয়টি করে?.....................টি
কেন আপনি ধুমপান বন্ধ করলেন?

..........................................................

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তামাক পাতা ব্যবহার (চিবানো, চোষা)

৭. আপনি কি তামাক পাতা ব্যবহার (চিবানো, চোষা) করেন?

☐ হাঁ (৮ নম্বর প্রশ্ন যান)  ☐ না (১১ নম্বর প্রশ্ন যান)

৮. যদি হাঁ হয়, কত বছর?.................. বছর  

প্রতিদিন কতবার করে?...............বার  

গত এক বছরের তুলনায়, আপনি কি মনে করেন আপনি আপনার চেয়ে বেশি তামাক পাতা ব্যবহার করেছেন, কম ব্যবহার করেছেন, অথবা একই হারে ব্যবহার করেছেন?

☐ বেশি তামাক পাতা ব্যবহার করছি (৯ নম্বর প্রশ্ন যান)  

☐ কম তামাক পাতা ব্যবহার করছি (৯ নম্বর প্রশ্ন যান)  

☐ একই হারে তামাক পাতা ব্যবহার করছি (১০ নম্বর প্রশ্ন যান)

৯. কেন আপনি আপনার তামাক পাতা ব্যবহারের অবস্থা (হার) পরিবর্তন করলেন? (১৩ নম্বর প্রশ্ন যান)

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১০. কেন আপনি আপনার তামাক পাতা ব্যবহারের অবস্থা (হার) পরিবর্তন করেননি? (১৩ নম্বর প্রশ্ন যান)

..........................................................

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১১. যদি না হয়, আপনি কি কখনো তামাক পাতা ব্যবহার করেছেন?

☐ হাঁ (১২ নম্বর প্রশ্ন যান)  ☐ না (১৩ নম্বর প্রশ্ন যান)

১২. যদি হাঁ হয়, কত বছর?......................বছর  

প্রতিদিন কতবার করে?...............বার
কেন আপনি তামাক পাতা ব্যবহার বন্ধ করলেন?

মদ্যপান করা

১৩. আপনি কি মদ্যপান করেন?

□ হ্যা (১৪ নম্বর প্রশ্ন যান)  □ না (১৭ নম্বর প্রশ্ন যান)

১৪. যদি হ্যা হয়,

প্রতি রাতে .................গ্লাস, অথবা প্রতি সপ্তাহে। .................গ্লাস

কত বছর? .................বছর

গত এক বছরের তুলনায়, আপনি কি মনে করেন আপনি আগের চেয়ে বেশি মদ্যপান করেছেন, কম মদ্যপান করেছেন, অথবা একই হারে মদ্যপান করেছেন?

□ বেশি মদ্যপান করছি (১৫ নম্বর প্রশ্ন যান)
□ কম মদ্যপান করছি (১৫ নম্বর প্রশ্ন যান)
□ একই হারে মদ্যপান করছি (১৬ নম্বর প্রশ্ন যান)

১৫. কেন আপনি আপনার মদ্যপানের অবস্থা (হার) পরিবর্তন করলেন? (১৯ নম্বর প্রশ্ন যান)

১৬. কেন আপনি আপনার মদ্যপানের অবস্থা (হার) পরিবর্তন করেননি? (১৯ নম্বর প্রশ্ন যান)

১৭. যদি না হয়, আপনি কি কখনো মদ্যপান করেছেন?

□ হ্যা (১৮ নম্বর প্রশ্ন যান)  □ না (১৯ নম্বর প্রশ্ন যান)

১৮. যদি হ্যা হয়,

প্রতি রাতে .................গ্লাস, অথবা প্রতি সপ্তাহে। .................গ্লাস

কত বছর? .................বছর
কেন আপনি মদ্যপান বন্ধ করলেন?


খাদ্যভাগ

১৯. আপনি কি নিরামিষভোজি?

☐ হাঁ ☐ না

২০. আপনি সাধারণত কত বার ফল খান? (১ বার = একটা মাঝারি আকৃতির অথবা ২ টি ছোটো টুকরা অথবা ১ কাপ কাঠা ফল বা আধা ১০০% ফলের শরবত)

☐ প্রতিদিন .............বার ☐ প্রতি সপ্তাহে .................বার

☐ ফলমূল খাই না ☐ জানি না

২১. আপনি সাধারণত কত বার সবজি খান? (১ বার = ১/২ কাপ টাটকা, হিমায়িত বা রেডিমেড সবজি বা ১ কাপ কাঁচা শাক জাতীয় সবজি)

☐ প্রতিদিন .............বার ☐ প্রতি সপ্তাহে .................বার

☐ শাকসবজি খাই না ☐ জানি না

২২. আপনি সাধারণত কত বার দানা জাতীয় খাবার খান? (১ বার = ১ফালি পাউডারটি বা অর্ধেক রুটি হেমন, চাপটি বা আধা কাপ ভাত)

☐ প্রতিদিন .............বার ☐ প্রতি সপ্তাহে .................বার

☐ দানা জাতীয় খাবার খাই না ☐ জানি না

২৩. আপনি সাধারণত কত বার মাছ বা মাংস খান? (১ বার = ১/২ কাপ রামা করা মাছ বা ১/২ কাপ রামা করা চরি ছাড়া মাংস বা ২ টি ডিম বা ২ টেবিল চামচ সম পরিমান চীনাবাদাম)

☐ প্রতিদিন .............বার ☐ প্রতি সপ্তাহে .................বার

☐ মাছ বা মাংস খাই না ☐ জানি না

২৪. আপনি কি কখনো কোমল পানীয় পান করেন?

☐ হাঁ (২৫ নব্র প্রশ্নে যান) ☐ না (২৬নব্র প্রশ্নে যান)

২৫. আপনি কত বার কমল পানীয় পান করেন?

☐ প্রতিদিন .............বার ☐ মাসে ....................বার
APPENDIX C   Clinical history forms and questionnaires

২৬. আপনি কি কখনো ফাস্ট ফুড খান?

□ হাঁ (২৭ নম্বর প্রশ্ন যান)    □ না (২৮ নম্বর প্রশ্ন যান)

২৭. আপনি কত বার ফাস্ট ফুড (পিজা, বার্গার) খান?

□ সম্পূর্ণ বার □ মাসে

২৮. আপনি প্রতিদিন কত প্লাস পানি পান করেন?

………………………………..প্লাস

২৯. আপনি কি খাবারে অতিরিক্ত লবন প্রদান করেন?

□ হাঁ    □ না

৩০. আপনি রান্নায় কি ধরনের তেল ব্যবহার করেন?

……………………………………………………………………………………………………………………………………

শারীরিক অনুশীলন

৩১. আপনার কাজের ক্ষেত্রে কি শারীরিক পরিশ্রম করতে হয়?

□ হাঁ    □ না

৩২. কাজের ক্ষেত্র ছাড়া আপনি কি ধরনের শারীরিক পরিশ্রম করেন?

□ পরিশ্রম বিহীন (বসে বসে কাজ যেমন, বই পড়া, টিভি দেখা, কম্পিউটারে কাজ করা, ব্যায়াম না করা)

□ হালকা পরিশ্রমের কাজ (যেমন, কাজের ক্ষেত্রে প্রচুর হাটা, বাসায় হাটাচলা করা, হালকা ব্যায়াম করা বা ৩ ঘণ্টার কম হাটা)

□ মাঝারি মাত্রায় পরিশ্রম (যেমন, বাগান করা, সপ্তাহে ৩ ঘন্টা ব্যায়াম করা বা সম পরিমান হাটা বা সাইকেল চালানো)

□ অতিমাত্রায় পরিশ্রম (যেমন, নির্মান শ্রমিকের মত অতিমাত্রায় কাজ, সপ্তাহে ৫ ঘন্টা ব্যায়াম করা বা দৌড়ানো বা সাঁতার করা)
Title: Socioeconomic, Cognitive, and Behavioural Variables Concerning Coronary Heart Disease from the Urban Population of Bangladesh

**Clinical history form (English)**

Age: .................years

Gender: □ Male □ Female

Have you been diagnosed with heart disease? □ Yes □ No

If yes, length of time since diagnosis........... years

Have you been diagnosed with diabetes? □ Yes □ No

If yes, □ Type I □ Type 2 □ Do not know

If yes, length of time since diagnosis....................years

Have you been diagnosed with high blood pressure? □ Yes □ No

If yes, length of time since diagnosis ..................... years

Have you been diagnosed with or experienced any of the following?

<table>
<thead>
<tr>
<th>Condition</th>
<th>□ Yes</th>
<th>□ No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rapid heartbeat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart attack</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain in left arm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dizziness</td>
<td></td>
<td></td>
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</tbody>
</table>

Other medical information:
............................................................................................................................................
............................................................................................................................................
Medications (traditional and/or pharmaceuticals)

<table>
<thead>
<tr>
<th>Medication name</th>
<th>What it is taken for</th>
<th>Dosage</th>
<th>Other information</th>
</tr>
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<tbody>
<tr>
<td></td>
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</tbody>
</table>

Short examination of health status

Consent form completed

Test 1. BMI
Height: ..........................................metres
Weight: ..........................................kg
BMI = ..................................................... (kg/m²)

Test 2. Waist circumference
Waist circumference: ..........................................cm

Test 3: Blood Pressure
Dizziness on rising:  □ Yes  □ No
Sitting (1 minute) ×2

<table>
<thead>
<tr>
<th>1st measurement</th>
<th>SBP</th>
<th>DBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>.................../...................mmHg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2nd measurement</th>
<th>SBP</th>
<th>DBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>.................../...................mmHg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Average

<table>
<thead>
<tr>
<th>1st measurement</th>
<th>SBP</th>
<th>DBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>.................../...................mmHg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Test 4: Blood sugar sample
Blood glucose level: ..........................................mmol/L
The first page of this material was printed on Charles Sturt University letterhead and also contained the logo for the International Centre for Diarrheal Diseases and Research, Bangladesh.

ID No: _ _ _            Date:  _  _  _

**Title:** Socioeconomic, Cognitive, and Behavioural Variables Concerning Coronary Heart Disease from the Urban Population of Bangladesh

**Questionnaire (English)**

**Section A: Demographic information**

1. Age:………………..years
2. Sex:    □  Male    □  Female
3. Marital status:
   □  Married   □  Unmarried   □  Widow/ Widower   □  Divorced
4. Are you able to sign your name?
   □  Yes (Go to Question 5)          □  No (Go to Question 5)
5. What is your highest level of education?
   □  Never been to school
   □  Primary (from class 1 to 5)
   □  Secondary (from class 6 to10)
   □  S.S.C. (Secondary school certificate)
   □  H.S.C. (Higher secondary certificate)
   □  Graduate
   □  Postgraduate
6. Where do you live?
   □  Slum area                       □  Non-slum area (e.g., apartment)
7. Employment status
   □  Employed                       □  Unemployed
8. What is your occupation?

……………………………………………………………………………………
……………………………………………………………………………………

9. What is your family income?

□ ≤10,000 taka          □ 10,001–20,000 taka
□ 20,001–30,000 taka    □ 30,001–40,000 taka
□ 40,001–50,000 taka    □ >50,000 taka

Section B: Knowledge about coronary heart disease

I am now going to ask you some questions that help me to understand what you know about heart disease. These are general knowledge questions.

What do you think about your level of knowledge about heart disease? (Additional information)

□ Very poor □ Poor □ Neither poor nor good □ Good □ Very good

Epidemiology

1. What do you think is the leading cause of death in Bangladesh?

……………………………………………………………………………………

2. Who do you think are more affected by heart disease? (You can choose more than one answer)

□ Males
□ Females before menopause
□ Females after menopause
□ Both males and females are affected equally

3. Do you think heart disease is a

□ Short-term disease □ Long-term disease
Pathophysiology

4. What do you know about heart disease?
................................................................................................................................
................................................................................................................................
................................................................................................................................
................................................................................................................................

5. What do you think changes in the body if a person has heart disease?
................................................................................................................................
................................................................................................................................
................................................................................................................................
................................................................................................................................

Risk factors

6. What do you think are the factors that increase the risk of heart disease (list as many risk factors as you can)?
................................................................................................................................
................................................................................................................................
................................................................................................................................
................................................................................................................................

7. How do you think these risk factors lead to heart disease?
................................................................................................................................
................................................................................................................................
................................................................................................................................
................................................................................................................................

8. What do you think is the single most preventable risk factor for heart disease?
................................................................................................................................
Signs / symptoms

9. How would you know if you or someone else was having a heart attack?
..........................................................................................................................................
..........................................................................................................................................
..........................................................................................................................................

10. Do you think someone can have heart disease and not know?
    □ Yes  □ No  □ Don’t know

Preventability

11. Is heart disease preventable?
    □ Yes (go to question 12)
    □ No (go to question 13)
    □ Do not know (go to question 14)

12. What things can you do to prevent heart disease?
..........................................................................................................................................
..........................................................................................................................................
..........................................................................................................................................

13. Why is heart disease not preventable?
..........................................................................................................................................
..........................................................................................................................................
..........................................................................................................................................

Treatment

14. Is heart disease treatable?
    □ Yes (go to question 15)
    □ No (go to question 16)
    □ Do not know (go to Section C)
15. How can heart disease be treated?

16. Why is heart disease not treatable?

Section C: Awareness of coronary heart disease

The next questions are about your awareness of heart disease

Own cardiovascular health

1. What do you think about your heart health?
   □ Very poor □ Poor □ Neither poor nor good □ Good □ Very good
   □ Do not understand

2. Are you concerned about your heart health?
   □ Yes (go to Question 3) □ No (go to Question 4)

3. What are you specifically concerned about?

4. Why are you not concerned about your heart health?

Own risk factor(s)

5. Are you aware of having any particular heart disease risk factor/factors?
   □ Yes (go to Question 6)
   □ I do not have any (go to Question 7)
   □ Do not know (go to Question 7)
6. What do you think are the particular risk factor/factors for you?

........................................................................................................................................................
........................................................................................................................................................

Preventive action towards heart disease

7. Have you taken any action to prevent heart disease?
   □ Yes (go to Question 8)  □ No (go to Question 10)

8. What do you think are the preventive actions you have taken to keep your heart healthy?

........................................................................................................................................................
........................................................................................................................................................
........................................................................................................................................................
........................................................................................................................................................

9. What are your reasons for taking these actions to keep your heart healthy? (go to Question 12)

........................................................................................................................................................
........................................................................................................................................................
........................................................................................................................................................
........................................................................................................................................................

10. Why have you not taken any action for yourself to prevent heart disease?

........................................................................................................................................................
........................................................................................................................................................
........................................................................................................................................................
........................................................................................................................................................

11. What are the consequences for you if you do not take any action to prevent heart disease?

........................................................................................................................................................
........................................................................................................................................................
........................................................................................................................................................
........................................................................................................................................................
Pre-diagnosed medical condition

12. Do you have any medical history of any medical condition related to your heart?
   □ Yes □ No □ Do not know

Pre-diagnosed CHD

13. Have you been told by a doctor or health care professional that you have heart disease?
   □ Yes □ No □ Do not know

Family history of CHD

14. Do any of your family members (e.g. mother, father, not cousin or wife) have heart disease?
   □ Yes □ No □ Do not know

Known person with CHD in the community

15. Do you know any person in your community with heart disease?
   □ Yes □ No □ Do not know

Taking action in the event of heart attack

16. If you thought you were experiencing signs of a heart attack, what is the first thing you would do?
   ………………………………………………………………………………………
   ………………………………………………………………………………………
   ………………………………………………………………………………………

17. If you thought someone else was experiencing a heart attack, what is the first thing you would do?
   ………………………………………………………………………………………
   ………………………………………………………………………………………
   ………………………………………………………………………………………
Section D: Lifestyle practices related to heart disease

Now I am going to ask you some questions related to your lifestyle behaviours

Tobacco smoking

1. Do you smoke tobacco?
   □ Yes (go to Question 2)  □ No (go to Question 5)

2. If yes,
   ➢ How many years? ........... years
   ➢ How many sticks per day? .......... sticks
   ➢ Compared to a year ago, do you think you are smoking more tobacco, less tobacco or about the same?
     o more tobacco (go to Question 3)
     o less tobacco (go to Question 3)
     o about the same (go to question 4)

3. Why did you change your smoking status? (go to question 7)
   .................................................................................................................................
   .................................................................................................................................
   .................................................................................................................................

4. Why did you not change your smoking status? (go to question 7)
   .................................................................................................................................
   .................................................................................................................................
   .................................................................................................................................

5. If no, have you ever smoked?
   □ Yes (go to Question 6)  □ No (go to Question 7)

6. If yes,
   ➢ How many years? ........... years
   ➢ How many sticks per day? .......... sticks
   ➢ Why did you stop smoking?
   .................................................................................................................................
   .................................................................................................................................
**Tobacco using (chewing, sucking)**

7. Do you use (chewing, sucking) tobacco?
   - □ Yes (go to Question 8)
   - □ No (go to Question 11)

8. If yes,
   - ▶ How many years? .......... years
   - ▶ How many times per day? .......... times
   - ▶ Compared to a year ago, do you think you are using more tobacco, less tobacco, or about the same?
     - o more tobacco (go to question 9)
     - o less tobacco (go to question 9)
     - o about the same (go to question 10)

9. Why did you change your tobacco using status? (go to Question 13)
   .................................................................................................................................
   .................................................................................................................................
   .................................................................................................................................

10. Why did you not change your tobacco using status? (go to Question 13)
    .................................................................................................................................
    .................................................................................................................................
    .................................................................................................................................

11. If no, have you ever consumed tobacco?
    - □ Yes (go to Question 12)
    - □ No (go to Question 13)

12. If yes,
   - ▶ How many years? .......... years
   - ▶ How many times per day? .......... times
   - ▶ Why did you stop chewing?
     .................................................................................................................................
     .................................................................................................................................
     .................................................................................................................................
Alcohol consumption

13. Do you consume alcohol?
   □ Yes (go to Question 14)   □ No (go to Question 17)

14. If yes,
   - …… …….drinks per night, or …………. drinks per week
   - How many years? .......... years
   - Compared to a year ago, do you think you are consuming/drinking more alcohol, less alcohol or about the same?
     - more alcohol (go to Question 15)
     - less alcohol (go to Question 15)
     - about the same (go to Question 16)

15. Why did you change your alcohol consumption status? (go to question 19)
   .................................................................................................................................
   .................................................................................................................................

16. Why did you not change your alcohol consumption status? (go to question 19)
   .................................................................................................................................
   .................................................................................................................................

17. If no, have you ever consumed alcohol?
   □ Yes (go to question 18)   □ No (go to question 19)

18. If yes,
   - ……………..drinks per night, or ………….. drinks per week?
   - How many years? ......... yrs
   - Why did you stop consuming alcohol?
     ............................................................................................................
     ............................................................................................................
     ............................................................................................................
Dietary habits

19. Are you a vegetarian?
   □ Yes □ No

20. How many serves of fruits do you usually eat per day? (1 serve = 1 medium piece or 2 small pieces of fruit or 1 cup of diced fruit or ½ cup 100% juice)
   □ …………….serves per day □ …………….serves per week
   □ Do not eat fruit □ Do not know

21. How many serves of vegetables do you usually eat? (1 serve = ½ cup fresh, frozen or canned vegetables or ½ cup cooked leafy vegetables or 1 cup raw leafy vegetables)
   □ …………….serves per day □ …………….serves per week
   □ Do not eat vegetables □ Do not know

22. How many serves of grains do you usually eat? (1 serve = 1 slice bread or ½ flat breads, e.g. chapati or ½ cup cooked rice)
   □ ……………. serves per day □ ……………. serves per week
   □ Do not eat grains □ Do not know

23. How many serves of fish/meat/alternatives do you usually eat? (1 serve = ½ cup cooked fish or ½ cup cooked lean meat or 2 eggs or 2 tablespoon peanuts)
   □ …………….serves per day □ …………….serves per week
   □ Do not eat fish/meat/alternatives □ Do not know

24. Do you consume soft drinks (e.g. Coca Cola, Pepsi)?
   □ Yes (go to Question 25)
   □ No (go to Question 26)

25. How many times do you consume soft drinks per week?
   …………………………………………..times per week
   …………………………………………..times per month
26. Do you consume fast food (e.g. burger, pizza)?
   □ Yes (go to Question 12)    □ No (go to Question 28)

27. How many times do you consume fast food per week?
   ..........................................................times per week
   ..........................................................times per month

28. How many glasses of water do you usually drink every day?
   ..........................................................glasses

29. Do you take extra salt in your meals?
   □ Yes    □ No

30. What sort of oil do you use for cooking?
   ..........................................................
   ..........................................................
   ..........................................................

Physical activity
31. Does your work involve any physical activity?
   □ Yes    □ No

32. What is your level of physical activity apart from your work?
   □ Sedentary (e.g. reading, watching TV, working at computer, you do not exercise)
   □ Light activity (e.g. at work you walk a lot or at home move a lot or participate in light exercise or walking less than 3 hours)
   □ Moderate activity (e.g. gardening, exercise at least 3 hours a week like walking or cycling)
   □ Strenuous (e.g. labour-intensive job like construction worker or exercise for at least five hours a week or involved in sports like jogging, swimming, football)
APPENDIX D

Supplementary Tables for Chapter 4

This appendix contains 14 tables that are supplementary to the text in Chapter 4, Results.

Table D.1

Leading Causes of Death in Bangladesh

<table>
<thead>
<tr>
<th>Leading cause of death</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart disease / heart attack</td>
<td>50.0</td>
<td>49.2</td>
<td>49.6</td>
</tr>
<tr>
<td>Do not know</td>
<td>2.1</td>
<td>17.9</td>
<td>10.0</td>
</tr>
<tr>
<td>Stroke</td>
<td>8.4</td>
<td>7.9</td>
<td>8.2</td>
</tr>
<tr>
<td>Lack of health awareness</td>
<td>10.5</td>
<td>0.8</td>
<td>5.6</td>
</tr>
<tr>
<td>Cancer</td>
<td>3.4</td>
<td>7.9</td>
<td>5.6</td>
</tr>
<tr>
<td>Food adulteration</td>
<td>5.9</td>
<td>1.2</td>
<td>3.6</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>5.0</td>
<td>0.4</td>
<td>2.7</td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td>2.5</td>
<td>0.0</td>
<td>1.3</td>
</tr>
<tr>
<td>Other</td>
<td>9.7</td>
<td>12.1</td>
<td>10.9</td>
</tr>
</tbody>
</table>
Table D.2

*Changes After Having CHD*

<table>
<thead>
<tr>
<th>Changes after having CHD</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunction of heart due to inappropriate blood circulation due to narrowing / block of artery as a result of fat / cholesterol deposition</td>
<td>81.9</td>
<td>5.4</td>
<td>43.5</td>
</tr>
<tr>
<td>Do not know</td>
<td>9.7</td>
<td>74.6</td>
<td>42.3</td>
</tr>
<tr>
<td>Weakness</td>
<td>4.6</td>
<td>8.3</td>
<td>6.5</td>
</tr>
<tr>
<td>Inability to move properly /cannot walk / climb stairs / physical inactivity</td>
<td>4.2</td>
<td>2.9</td>
<td>3.6</td>
</tr>
<tr>
<td>Breathing problem</td>
<td>2.1</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td>HTN</td>
<td>2.1</td>
<td>1.2</td>
<td>1.7</td>
</tr>
<tr>
<td>Reduced food intake</td>
<td>0.4</td>
<td>2.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Irregular heart beat</td>
<td>1.3</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>Reduced weight</td>
<td>0.8</td>
<td>1.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Chest pain</td>
<td>1.7</td>
<td>0.8</td>
<td>1.3</td>
</tr>
<tr>
<td>Other</td>
<td>5.5</td>
<td>8.7</td>
<td>7.1</td>
</tr>
</tbody>
</table>

Table D.3

*Single Most Preventable Risk Factor*

<table>
<thead>
<tr>
<th>Factor</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unhealthy diet</td>
<td>38.2</td>
<td>10.4</td>
<td>24.3</td>
</tr>
<tr>
<td>Mental stress</td>
<td>11.8</td>
<td>27.9</td>
<td>19.9</td>
</tr>
<tr>
<td>Smoking</td>
<td>18.1</td>
<td>10.4</td>
<td>14.2</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>9.2</td>
<td>2.1</td>
<td>5.6</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>10.9</td>
<td>0.0</td>
<td>5.4</td>
</tr>
<tr>
<td>Work stress</td>
<td>0.0</td>
<td>5.8</td>
<td>2.9</td>
</tr>
<tr>
<td>HTN</td>
<td>2.1</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td>Undisciplined lifestyle</td>
<td>2.5</td>
<td>0.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Alcohol consumption</td>
<td>0.4</td>
<td>1.7</td>
<td>1.0</td>
</tr>
<tr>
<td>Other</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Do not know</td>
<td>1.7</td>
<td>34.2</td>
<td>18.0</td>
</tr>
</tbody>
</table>
Table D.4

*Why CHD Can Not Be Prevented*

<table>
<thead>
<tr>
<th>Reasons</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not know / how would I know/ I cannot say as I do not have the disease</td>
<td>23.1</td>
<td>53.1</td>
<td>41.7</td>
</tr>
<tr>
<td>Nothing to do, it happens automatically</td>
<td>0.0</td>
<td>19.1</td>
<td>15.0</td>
</tr>
<tr>
<td>I depends on Allah/fate</td>
<td>7.7</td>
<td>17.0</td>
<td>15.0</td>
</tr>
<tr>
<td>It cannot be prevented, it can be controlled</td>
<td>53.8</td>
<td>2.1</td>
<td>13.3</td>
</tr>
<tr>
<td>Inappropriate system of Bangladesh, Bangladesh holds the top position in food adulteration</td>
<td>0.0</td>
<td>4.3</td>
<td>3.3</td>
</tr>
<tr>
<td>People do not understand how to prevent, that's why it cannot be prevented</td>
<td>0.0</td>
<td>2.1</td>
<td>1.7</td>
</tr>
<tr>
<td>Lack of awareness</td>
<td>7.7</td>
<td>0.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Nobody knows the time of having disease</td>
<td>0.0</td>
<td>2.1</td>
<td>1.7</td>
</tr>
<tr>
<td>It varies; I avoided the risk factors, still I have got the disease</td>
<td>7.7</td>
<td>0.0</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Table D.5

*How CHD Can Be Treated*

<table>
<thead>
<tr>
<th>How can CHD be Treated</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication</td>
<td>67.1</td>
<td>69.3</td>
<td>68.2</td>
</tr>
<tr>
<td>Surgery</td>
<td>63.7</td>
<td>9.2</td>
<td>37.0</td>
</tr>
<tr>
<td>Lifestyle modification/ control or avoid risk factors</td>
<td>38.0</td>
<td>14.9</td>
<td>26.7</td>
</tr>
<tr>
<td>Diagnosis of disease</td>
<td>9.7</td>
<td>27.2</td>
<td>18.3</td>
</tr>
<tr>
<td>Doctor’s advice</td>
<td>2.1</td>
<td>7.9</td>
<td>4.9</td>
</tr>
<tr>
<td>Regular check-up</td>
<td>3.8</td>
<td>1.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Provide oxygen</td>
<td>1.7</td>
<td>0.9</td>
<td>1.3</td>
</tr>
<tr>
<td>It depends according to severity</td>
<td>1.7</td>
<td>0.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Press the chest</td>
<td>0.8</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Other</td>
<td>0.8</td>
<td>2.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Do not know/ doctors treat, how could I know what sort of treatment they would provide</td>
<td>1.7</td>
<td>17.5</td>
<td>9.5</td>
</tr>
</tbody>
</table>
Table D.6
Awareness About One’s Own Risk Factors

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental stress</td>
<td>32.0</td>
<td>56.7</td>
<td>39.1</td>
</tr>
<tr>
<td>Unhealthy diet</td>
<td>32.0</td>
<td>11.7</td>
<td>26.1</td>
</tr>
<tr>
<td>Smoking</td>
<td>20.4</td>
<td>33.4</td>
<td>24.2</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>15.6</td>
<td>3.3</td>
<td>12.1</td>
</tr>
<tr>
<td>Hypertension</td>
<td>12.2</td>
<td>1.7</td>
<td>9.2</td>
</tr>
<tr>
<td>Obesity</td>
<td>7.5</td>
<td>3.3</td>
<td>6.3</td>
</tr>
<tr>
<td>High cholesterol</td>
<td>8.8</td>
<td>0.0</td>
<td>6.3</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>5.4</td>
<td>0.0</td>
<td>3.9</td>
</tr>
<tr>
<td>Family history</td>
<td>4.8</td>
<td>1.7</td>
<td>3.9</td>
</tr>
<tr>
<td>Tobacco chewing</td>
<td>0.7</td>
<td>3.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Work stress</td>
<td>0.7</td>
<td>3.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Age</td>
<td>0.7</td>
<td>1.7</td>
<td>1.0</td>
</tr>
<tr>
<td>Food adulteration</td>
<td>1.4</td>
<td>0.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Air pollution</td>
<td>0.7</td>
<td>1.7</td>
<td>1.0</td>
</tr>
<tr>
<td>Cold cough</td>
<td>0.0</td>
<td>3.3</td>
<td>1.0</td>
</tr>
<tr>
<td>Sleeping disturbance</td>
<td>0.0</td>
<td>1.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Go to bed late night and rise late</td>
<td>0.7</td>
<td>0.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Too much travelling</td>
<td>0.0</td>
<td>1.7</td>
<td>0.5</td>
</tr>
</tbody>
</table>
### Table D.7

*Preventive Actions Taken Against CHD by Participants*

<table>
<thead>
<tr>
<th>Actions taken</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I lead a healthy lifestyle</td>
<td>72.8</td>
<td>60.0</td>
<td>70.8</td>
</tr>
<tr>
<td>Regular check up, medicine and healthy lifestyle</td>
<td>2.9</td>
<td>0.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Avoid / control risk factors</td>
<td>6.6</td>
<td>4.0</td>
<td>6.2</td>
</tr>
<tr>
<td>Regular check up</td>
<td>1.5</td>
<td>20.0</td>
<td>4.3</td>
</tr>
<tr>
<td>Regular check up, meditation and lead healthy lifestyle</td>
<td>2.9</td>
<td>0.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Sufficient water intake</td>
<td>0.0</td>
<td>8.0</td>
<td>1.2</td>
</tr>
<tr>
<td>Meditation</td>
<td>1.5</td>
<td>0.0</td>
<td>1.2</td>
</tr>
<tr>
<td>Medicine and surgery</td>
<td>0.7</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Medicine and healthy lifestyle</td>
<td>0.7</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Accu pressure, medicine and consume powder of ginger + coriander + amla + cumin</td>
<td>0.7</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Consume garlic and healthy diet</td>
<td>0.7</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Avoid crowded environment and healthy diet</td>
<td>0.0</td>
<td>4.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Medicines and consume juice of ginger+ garlic+ lemon+ cedar + honey</td>
<td>0.7</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Consume black cumin seed oil + tea</td>
<td>0.7</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Homeopathy, consume ginger + garlic and physical activity</td>
<td>0.7</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Consume neem leaf juice+ honey</td>
<td>0.0</td>
<td>4.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Try to reduce formalin’s effect by processing</td>
<td>0.7</td>
<td>0.0</td>
<td>0.6</td>
</tr>
</tbody>
</table>
## Table D.8

*Reason for Taking Preventive Action Against CHD*

<table>
<thead>
<tr>
<th>Reason for taking preventive actions</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>For overall health / to be healthy</td>
<td>36.8</td>
<td>40.0</td>
<td>37.3</td>
</tr>
<tr>
<td>As I have HD/ HTN /DM / high cholesterol / asthma / Stroke</td>
<td>14.7</td>
<td>4.0</td>
<td>13.0</td>
</tr>
<tr>
<td>To avoid DM / HD / HTN / several diseases</td>
<td>10.3</td>
<td>8.0</td>
<td>9.9</td>
</tr>
<tr>
<td>To live longer in a healthy way</td>
<td>6.6</td>
<td>0.0</td>
<td>5.6</td>
</tr>
<tr>
<td>As I had chest pain / have some health problems</td>
<td>2.9</td>
<td>8.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Doctor asked to do so</td>
<td>2.9</td>
<td>4.0</td>
<td>3.1</td>
</tr>
<tr>
<td>As I am getting aged; I should take care</td>
<td>3.7</td>
<td>0.0</td>
<td>3.1</td>
</tr>
<tr>
<td>I read it in newspaper / I heard it is good for health / watching awareness program</td>
<td>3.7</td>
<td>0.0</td>
<td>3.1</td>
</tr>
<tr>
<td>To reduce body weight / to look good / I do not like overweight</td>
<td>2.9</td>
<td>4.0</td>
<td>3.1</td>
</tr>
<tr>
<td>As I am an aware person / as a precaution</td>
<td>2.9</td>
<td>0.0</td>
<td>2.5</td>
</tr>
<tr>
<td>I understand / heard these factors lead to HD / harmful for health</td>
<td>1.5</td>
<td>8.0</td>
<td>2.5</td>
</tr>
<tr>
<td>For my family / to provide social support to my children</td>
<td>1.5</td>
<td>4.0</td>
<td>1.9</td>
</tr>
<tr>
<td>I have to walk for office</td>
<td>0.7</td>
<td>4.0</td>
<td>1.2</td>
</tr>
<tr>
<td>I do not like, I have diabetes / skin allergy</td>
<td>0.7</td>
<td>4.0</td>
<td>1.2</td>
</tr>
<tr>
<td>I know the sufferings of heart disease</td>
<td>0.7</td>
<td>4.0</td>
<td>1.2</td>
</tr>
<tr>
<td>As I have family history</td>
<td>1.5</td>
<td>0.0</td>
<td>1.2</td>
</tr>
<tr>
<td>Other</td>
<td>5.6</td>
<td>0.8</td>
<td>6.4</td>
</tr>
</tbody>
</table>
Table D.9

Reason for Not Taking Any Preventive Action Against CHD

<table>
<thead>
<tr>
<th>Reason</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>As I do not have HD / any problem / I am healthy</td>
<td>41.2</td>
<td>23.7</td>
<td>29.3</td>
</tr>
<tr>
<td>No reason</td>
<td>14.7</td>
<td>16.3</td>
<td>15.8</td>
</tr>
<tr>
<td>Do not have knowledge on preventive steps</td>
<td>5.9</td>
<td>13.5</td>
<td>11.0</td>
</tr>
<tr>
<td>Do not know</td>
<td>2.0</td>
<td>11.2</td>
<td>8.2</td>
</tr>
<tr>
<td>Lack of money</td>
<td>1.0</td>
<td>11.2</td>
<td>7.9</td>
</tr>
<tr>
<td>Do not need / do not feel interest</td>
<td>2.9</td>
<td>5.6</td>
<td>4.7</td>
</tr>
<tr>
<td>Carelessness / lethargy about myself</td>
<td>8.8</td>
<td>1.4</td>
<td>3.8</td>
</tr>
<tr>
<td>Do not know whether I have a problem or not</td>
<td>5.9</td>
<td>1.9</td>
<td>3.2</td>
</tr>
<tr>
<td>Lack of time</td>
<td>2.9</td>
<td>2.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Think to go to doctor but did not go / I will go to doctor later</td>
<td>1.0</td>
<td>1.9</td>
<td>1.6</td>
</tr>
<tr>
<td>I do not think about it</td>
<td>2.9</td>
<td>0.9</td>
<td>1.6</td>
</tr>
<tr>
<td>Lack of awareness</td>
<td>2.9</td>
<td>0.9</td>
<td>1.6</td>
</tr>
<tr>
<td>My problem was solved by having pain killer / automatically, that’s why</td>
<td>0.0</td>
<td>1.9</td>
<td>1.3</td>
</tr>
<tr>
<td>did not go to doctor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I should not have HD as I am at my early age / I have time as I am</td>
<td>3.9</td>
<td>0.0</td>
<td>1.3</td>
</tr>
<tr>
<td>40 years only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I cannot prevent having disease if Allah wants / it depends on fate</td>
<td>0.0</td>
<td>0.9</td>
<td>0.6</td>
</tr>
<tr>
<td>As I have minor problem</td>
<td>1.0</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>I do not think chest pain / weakness is a problem</td>
<td>0.0</td>
<td>0.9</td>
<td>0.6</td>
</tr>
<tr>
<td>Do not know where I should go</td>
<td>1.0</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Other</td>
<td>2.0</td>
<td>3.8</td>
<td>3.2</td>
</tr>
</tbody>
</table>
**Table D.10**

*Consequence of Not Taking Any Preventive Action Against CHD*

<table>
<thead>
<tr>
<th>Consequence of not taking any preventive action</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May have heart disease or attack suddenly</td>
<td>44.1</td>
<td>21.4</td>
<td>28.7</td>
</tr>
<tr>
<td>May have bad effect on health</td>
<td>18.6</td>
<td>27.0</td>
<td>24.3</td>
</tr>
<tr>
<td>Not sure/ how would I say / do not know</td>
<td>15.7</td>
<td>27.9</td>
<td>24.0</td>
</tr>
<tr>
<td>May die</td>
<td>3.9</td>
<td>10.7</td>
<td>8.5</td>
</tr>
<tr>
<td>Allah knows</td>
<td>5.9</td>
<td>6.5</td>
<td>6.3</td>
</tr>
<tr>
<td>I am confident 1 / no effect</td>
<td>4.9</td>
<td>1.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Good</td>
<td>2.0</td>
<td>0.9</td>
<td>1.3</td>
</tr>
<tr>
<td>After having the disease I will take steps</td>
<td>0.0</td>
<td>1.4</td>
<td>0.9</td>
</tr>
<tr>
<td>As I am physically fit; I do not think I may have any health problem in 3–4 years</td>
<td>2.9</td>
<td>0.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Death, nobody can stop dying</td>
<td>0.0</td>
<td>0.9</td>
<td>0.6</td>
</tr>
<tr>
<td>Let’s see what will happen</td>
<td>1.0</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>I am quite well, Allah knows; I cannot overcome if Allah wants</td>
<td>1.0</td>
<td>0.0</td>
<td>0.3</td>
</tr>
<tr>
<td>Bad effect, may die or may reduce money</td>
<td>0.0</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>After getting aged, I may face problem</td>
<td>0.0</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>Nothing to do, as I do not have money</td>
<td>0.0</td>
<td>0.5</td>
<td>0.3</td>
</tr>
</tbody>
</table>
Table D.11

*Participants’ Awareness About Their Own Heart Health*

<table>
<thead>
<tr>
<th>Reason for being concerned</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sometimes feel chest pain / breathing problem / sweating / palpitation / dizziness / weakness at work</td>
<td>31.4</td>
<td>79.8</td>
<td>52.8</td>
</tr>
<tr>
<td>I have risk factor / factors of HD / do not lead healthy lifestyle practice</td>
<td>35.6</td>
<td>6.4</td>
<td>22.6</td>
</tr>
<tr>
<td>I may have the disease / heart attack any time</td>
<td>9.3</td>
<td>1.1</td>
<td>5.7</td>
</tr>
<tr>
<td>As I have the disease</td>
<td>8.5</td>
<td>1.1</td>
<td>5.2</td>
</tr>
<tr>
<td>I am scared of having HD / HA as lots of people do have</td>
<td>4.2</td>
<td>0.0</td>
<td>2.4</td>
</tr>
<tr>
<td>Cough / body ache / reduced body weight / as I have asthma</td>
<td>0.8</td>
<td>3.2</td>
<td>1.9</td>
</tr>
<tr>
<td>Overall health</td>
<td>1.7</td>
<td>1.1</td>
<td>1.4</td>
</tr>
<tr>
<td>I cannot tolerate any sad news</td>
<td>0.8</td>
<td>1.1</td>
<td>0.9</td>
</tr>
<tr>
<td>As my family do not have to suffer</td>
<td>1.7</td>
<td>0.0</td>
<td>0.9</td>
</tr>
<tr>
<td>As I have not examined yet</td>
<td>1.7</td>
<td>0.0</td>
<td>0.9</td>
</tr>
<tr>
<td>I think my heart is weak</td>
<td>0.0</td>
<td>1.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Other</td>
<td>4.2</td>
<td>5.3</td>
<td>4.7</td>
</tr>
</tbody>
</table>
Table D.12

*Reasons for Not Being Concerned About One’s Own Heart Health*

<table>
<thead>
<tr>
<th>Reason</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>As I am healthy/ do not have the disease/ any problem</td>
<td>70.0</td>
<td>84.8</td>
<td>78.1</td>
</tr>
<tr>
<td>I lead a healthy lifestyle</td>
<td>7.5</td>
<td>2.1</td>
<td>4.5</td>
</tr>
<tr>
<td>Do not have any cause</td>
<td>3.3</td>
<td>5.5</td>
<td>4.5</td>
</tr>
<tr>
<td>I should not concentrate on / think about that / I am not tensed of</td>
<td>3.3</td>
<td>2.1</td>
<td>2.6</td>
</tr>
<tr>
<td>anything by natural</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not have any risk factor / As my risk factor is under control</td>
<td>4.2</td>
<td>0.7</td>
<td>2.3</td>
</tr>
<tr>
<td>I checked up my heart / I checked up by accupressure and did not</td>
<td>2.5</td>
<td>0.0</td>
<td>1.1</td>
</tr>
<tr>
<td>find anything</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What can I do by being concerned</td>
<td>0.0</td>
<td>2.1</td>
<td>1.1</td>
</tr>
<tr>
<td>I have regular check-ups</td>
<td>0.8</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>I can work up to 16–17 hours properly/ I can work properly</td>
<td>0.0</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>As I am taking medicines regularly, lead a healthy lifestyle, and</td>
<td>0.8</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>do regular check up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As I am aware</td>
<td>1.7</td>
<td>0.0</td>
<td>0.8</td>
</tr>
<tr>
<td>Poor people should not think about it</td>
<td>0.0</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td>As my family members are OK</td>
<td>0.8</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>I do not face any problem though I underwent a heart surgery</td>
<td>0.8</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>I have to die when Allah will call</td>
<td>0.8</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>I am pretty fine; Allah knows what will happen next</td>
<td>0.8</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>If I would know that I have HD in that case I would be concerned</td>
<td>0.0</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td>If I would be concerned my health problem would be aggravated</td>
<td>0.8</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>I am not afraid of death</td>
<td>0.8</td>
<td>0.0</td>
<td>0.4</td>
</tr>
</tbody>
</table>
Table D.13

*First Thing Would Do After Having a Heart Attack*

<table>
<thead>
<tr>
<th>Action</th>
<th>HSES (%)</th>
<th>LSES (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go to doctor / admitted in a hospital as early as possible / within an hour</td>
<td>85.7</td>
<td>85.0</td>
<td>85.4</td>
</tr>
<tr>
<td>Call / Tell someone/ husband / relatives</td>
<td>7.6</td>
<td>8.3</td>
<td>7.9</td>
</tr>
<tr>
<td>Try to sit or lie down / take rest / be easy</td>
<td>5.9</td>
<td>1.7</td>
<td>3.8</td>
</tr>
<tr>
<td>Do not know</td>
<td>0.8</td>
<td>4.6</td>
<td>2.7</td>
</tr>
<tr>
<td>Put Nitromint tablet /spray under tongue / take aspirin tablet / take medicine</td>
<td>3.8</td>
<td>0.4</td>
<td>2.1</td>
</tr>
<tr>
<td>Pour some water on head</td>
<td>0.0</td>
<td>2.9</td>
<td>1.5</td>
</tr>
<tr>
<td>Nothing to do by myself, people/ relative near to me will do</td>
<td>1.3</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>Try to breath</td>
<td>1.3</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Try to press my chest</td>
<td>0.8</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Try to control BP</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Put a wet towel on my neck (water therapy)</td>
<td>0.8</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Take tamarind juice with salt and water</td>
<td>0.0</td>
<td>0.8</td>
<td>0.4</td>
</tr>
<tr>
<td>Eat raw egg</td>
<td>0.0</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>Put mixture of water and oil on head</td>
<td>0.4</td>
<td>0.0</td>
<td>0.2</td>
</tr>
<tr>
<td>It depends on Allah because of money</td>
<td>0.0</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>Do not tell anybody</td>
<td>0.0</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>Action</td>
<td>HSES (%)</td>
<td>LSES (%)</td>
<td>Total (%)</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td>----------</td>
<td>----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Take him/ try to take him to doctor / hospital immediately / within an hour/ Call an ambulance/call a doctor</td>
<td>92.0</td>
<td>87.9</td>
<td>90.0</td>
</tr>
<tr>
<td>Try to make him easy / ask him to sit or lie down</td>
<td>6.7</td>
<td>1.2</td>
<td>4.0</td>
</tr>
<tr>
<td>Advise him to go to doctor /hospital</td>
<td>3.4</td>
<td>2.9</td>
<td>3.1</td>
</tr>
<tr>
<td>Pour some water on his head</td>
<td>0.4</td>
<td>4.2</td>
<td>2.3</td>
</tr>
<tr>
<td>Do not know</td>
<td>0.0</td>
<td>4.2</td>
<td>2.1</td>
</tr>
<tr>
<td>Put Nitromint tablet /spray under tongue / aspirin tablet</td>
<td>2.9</td>
<td>0.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Call someone</td>
<td>0.8</td>
<td>2.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Try to give him first aid / manage him primarily until go to the doctor/ press the chest / blow in his mouth</td>
<td>5.0</td>
<td>0.0</td>
<td>2.7</td>
</tr>
<tr>
<td>Feed him sour thing/ tamarind juice with salt and water / tamarind</td>
<td>0.0</td>
<td>1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Fan the person</td>
<td>0.8</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Feed him water</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Do not do anything</td>
<td>0.0</td>
<td>0.8</td>
<td>0.4</td>
</tr>
<tr>
<td>Massage chest</td>
<td>0.0</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>Feed him raw egg</td>
<td>0.0</td>
<td>0.4</td>
<td>0.2</td>
</tr>
</tbody>
</table>