P-ISSN: 2617-9806
E-ISSN: 2617-9814

Impact Factor: RJIF 5.2
www.nursingjournal.net

International Journal of Advance Research in Nursing
Volume 7; Issue 2; Jul-Dec 2024; Page No. 295-305

Received: 28-10-2024
Accepted: 02-12-2024

Indexed Journal
Peer Reviewed Journal

Knowledge and attitude regarding cardiovascular disease among young adults' attending of a selected tertiary level hospital in Dhaka city, Bangladesh

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DOI: https://doi.org/10.33545/nursing.2024.v7.i2.D.431

Abstract
Cardiovascular diseases are the leading causes of hospitalizations and deaths worldwide, placing a significant economic burden on the healthcare system. Various risk factors are linked to the occurrence of cardiovascular events. At the heart of efficient prevention of cardiovascular disease is the concept of risk assessment.
Objective: The objective of the study was to determine the Knowledge and attitude regarding cardiovascular disease among Young Adults at a Selected Hospital in Bangladesh.
Methods: A descriptive type of cross-sectional study design was used to conduct the study. Conveniently 381patients who were developed cardiovascular disease were selected from Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh. A pre-tested modified interviewers administered semi-structured questionnaires was used to collect the information.
Results: This study found that 50.4% of the participants were aged 31-34 years, with a mean age of 27.01 ± 10.41 years. The majority of the participants (61.3%) were male, 75.7% of them belonged to Muslim families, more than sixty percent (67.8%) of the participants were married, 65.3% lived in a rural area, above half of the participants (59.6%) were living in joint families, 30.2% had completed a secondary level of education, more than one third of the participants (34.9%) were day labor, among them 54.1% had monthly family income less than 10000 BDT. Approximately 34.9% of participants answered correctly regarding the statement that cardiovascular health is related to the heart, 16.5% acknowledged that light walking can prevent cardiovascular disease, and 49.1% agreed that quitting smoking is beneficial. On the other hand, 57.5% of the respondents strongly disagreed.
Conclusion: It is essential to establish a training program for the younger generation to increase awareness of cardiovascular disease prevention and its risk factors.

Keywords: Knowledge, attitude, cardiovascular disease, young adults

Introduction

Cardiovascular disease (CVD) has been the major cause of mortality and morbidity worldwide in the past decade [1]. During 2012 CVD killed 17.5 million people around the world, 80% of these deaths occurred in low and middle income countries (LMIC). It is also estimated that in 2030 CVD will kill 22.24 million people [2]. In the United States 2012, approximately 787,431 people died from CVD [3]. In Australia, cardiovascular disease (CVD) caused 43,946 deaths in 2012, accounting for 29.9% of the total deaths that year [4]. An estimated 3.4 million people were living with CVD in 2007-2008 [5]. In India 2016, CVDs were responsible for 28.1% of all deaths. The number of deaths from CVD is projected to increase from 2.26 million in 1990 to 4.77 million in 2020 [6]. Like other countries, CVD prevalence is also rising among adults in Bangladesh. In the past few decades, Bangladesh has seen a notable rise in the prevalence of non-communicable chronic diseases and the associated mortality rates [7]. Women in Bangladesh are more vulnerable than any other group in all socio-economic parameters [8]. Since the first recommendations for female-specific preventive cardiology were published in 1999, our understanding of strategies to prevent cardiovascular disease (CVD) has significantly improved [9]. There are few studies being conducted in Bangladesh that specifically focus on women. The term "cardiovascular diseases" (CVDs) refers to a variety of heart and blood vessel conditions [10].

Preliminary results from the largest heart attack study conducted in Bangladesh indicate that individuals in Bangladesh are experiencing heart attacks at least ten years earlier than those in Western countries. The study also found that heart attacks in Bangladesh often happen to people 52 years of age, with those less than 50 making up nearly 40% of all cases [11-12]. These are the primary global causes of illness and mortality [13].

Non-communicable diseases (NCDs) are the leading cause of death worldwide, resulting in more fatalities each year than all other causes combined. Approximately 80% of NCD deaths occur in low- and middle-income countries, against popular notion [14-15]. In Bangladesh, non-communicable diseases account for 67% of all deaths, with an estimated 30% of total fatalities caused by cardiovascular

diseases [16]. Despite their unjust distribution and rapid growth, well- understood, affordable, and practical therapies could save a large portion of the human and socio-economic burden that NCD-related deaths cause each year [17]. In 2015, the Bangladesh Bureau of Statistics reported considerable increases in heart disease, cancer, and arthritis since 2000. From 1.6 per thousand in 2000, the prevalence of cardiac disorders increased to 6.59 per thousand in 2014 [19].

Globally, cardiovascular diseases (CVDs) are the primary cause of death. Ischemic heart disease (IHD) is a major cause of death in wealthy countries and a significant contributor to disease burden in developing nations [20]. Heart disease and stroke are estimated to claim the lives of 17 million people globally each year, and by 2030, this number is expected to rise to 23.6 million [21]. Since the early 1970s, cardiovascular disease (CVD) has been recognized as the leading cause of death and illness among adults in Bangladesh. Bangladesh is still at risk for CVD despite advances in technology and the healthcare system [22].

Coronary heart disease and stroke are the two leading causes of health loss related to cardiovascular disease globally [24-25]. The primary risk factors for cardiovascular disease (CVD) include smoking, hypertension, diabetes mellitus, and dyslipidemia. CVD encompasses various conditions such as heart defects, peripheral arterial disease, coronary heart disease, stroke, deep vein thrombosis, and pulmonary embolism [26-27]. Approximately 17.9 million people die each year due to cardiovascular diseases (CVDs) [29]. A study identified that the risk factors for CVD include smoking, high cholesterol, diabetes, being sedentary life style, being obese, eating a diet high in fat, and drinking too much alcohol [30-31]. The majority of cardiovascular problems can be prevented by quitting smoking, reducing salt intake, eating more fruits and vegetables rather than fattening foods, exercising frequently, and avoiding excessive alcohol intake. Promoting health policies that provide affordable and accessible healthy options is essential for individuals to adopt and maintain healthy behaviors [32-33].

The cardiovascular system is made up of the heart and the network of blood vessels. Endocarditis, rheumatic heart disease, and anomalies of the conduction system are just a few of the many issues that can occur in it. Cardiovascular disease, commonly known as heart disease, includes four main types: coronary artery disease (CAD), cerebrovascular disease, peripheral artery disease (PAD), and aortic atherosclerosis [34]. CAD results from decreased myocardial perfusion that causes angina due to ischemia and can result in myocardial infarction (MI), and heart failure. It accounts for one-third to one-half of all cases of cardiovascular disease. Cerebrovascular disease is the entity associated with strokes, also termed cerebrovascular accidents, and transient ischemic attacks [35]. Peripheral arterial disease is a condition that affects the arteries in the limbs and can lead to claudication [36]. Aortic atherosclerosis is the entity associated with thoracic and abdominal aneurysms [37].

The analysis may include the following cardiovascular events: Cerebrovascular disease, dysrhythmia, thrombotic conditions, such as blood clots or deep vein thrombosis, heart failure, inflammatory heart disease, peripheral vascular disease, aneurysms (Including ruptured or ballooning arteries), ischemic heart disease (Which includes any condition caused by the narrowing of the arteries supplying the heart, such as heart attacks and angina), other conditions, like cardiac arrest. It provides a clear overview of various cardiovascular events that could be analyzed [38].

Cardiovascular disease (CVD) involves the heart or blood vessels. It refers to a range of conditions that affect the heart and blood vessels. CVD includes several specific diseases, such as coronary artery disease (Which encompasses angina and heart attacks), stroke, heart failure, hypertensive heart disease, rheumatic heart disease, cardiomyopathy, abnormal heart rhythms, congenital heart disease, valvular heart disease, carditis, aortic aneurysms, peripheral artery disease, thromboembolic disease, and venous thrombosis. The severity of these conditions can vary, affecting individuals' health in different ways [39-40]. The underlying mechanisms vary depending on the disease. Itis estimated that dietary risk factors are associated with 53% of CVD deaths. Coronary artery disease, stroke, and peripheral artery disease involve atherosclerosis. This may be caused by high blood pressure, smoking, diabetes mellitus, lack of exercise, obesity, high blood cholesterol, poor diet, excessive alcohol consumption, and Poor sleep, among other things. High blood pressure is estimated to account for approximately 13% of CVD deaths, while tobacco accounts for 9%, diabetes 6%, lack of exercise 6%, and obesity 5%. Rheumatic heart disease may follow untreated strep throat [9].

Evidence-based interventions for secondary prevention include aspirin, beta-blockers, angiotensin-converting enzyme inhibitors, lipid-lowering medications, and other antihypertensive drugs, along with lifestyle modifications to reduce risk behaviors. While the specific role of exercise alone in reducing cardiovascular outcomes is not entirely clear, systematic reviews of randomized controlled trials (RCTs) have shown that cardiac rehabilitation, which includes physical exercise, improves coronary risk factors and decreases the risk of major cardiac events in individuals who have suffered a myocardial infarction (MI) {41]. Dietary modifications for nutritious food: RCTs have shown that advising individuals with myocardial infarction (MI) to increase their intake of fish, fruits, vegetables, bread, pasta, potatoes, olive oil, and margarine can lead to a significant improvement in survival rates. In addition to pharmacological treatments for secondary prevention, evidence indicates that lifestyle changes such as quitting smoking, adopting a healthy diet, and engaging in regular exercise can also greatly reduce cardiovascular mortality in people with established cardiovascular disease [42]. Evidence from epidemiological studies indicates that people with coronary heart disease who stop smoking rapidly reduce their risk of recurrent coronary events or death. In the case of stroke survivors, observational studies have shown that the excess risk of stroke among former smokers largely disappeared 2-4 years after smoking cessation [43].

Cardiovascular disease is the primary cause of death for both men and women in developed and developing countries [44]. A survey predicted that between 1970 and 2015, the mortality rate from CVD would decline in wealthy countries while nearly increasing in developing ones [45]. Bangladesh has recently experienced a notable shift in its epidemiological profile, transitioning from communicable

diseases to non-communicable diseases. Myocardial infarction, which is the primary symptom of coronary heart disease, is now one of the leading causes of death in the country. However, there is limited reliable information about the factors contributing to this condition within the population [46]. Identifying CVD risk factors and taking preventive measures is essential for early detection of cardiovascular disease [47-48].

Early identification of CVD can save resources and lives [41-42]. Unfortunately, there have been very few studies conducted in Bangladesh. This study aimed to ascertain the knowledge and attitudes of patients in the Bangladeshi community about the risk of cardiovascular disease. Therefore, the purpose of this study is to determine patients' knowledge and attitudes towards the primary risk factors for cardiovascular diseases. It also seeks to investigate the underlying elements that influence participants' knowledge and attitudes to reduce these risk factors through appropriate intervention measures.

Objectives

General objective

To determine the knowledge and attitude toward cardiovascular disease among young adults.

Specific objectives

1. To assess the socio-demographic characteristics of the participants.
2. To identify the level of knowledge regarding cardiovascular disease among the participants.
3. To determine the level of attitude regarding cardiovascular disease among the participants.

Literature Review

A cross-sectional study was conducted to assess knowledge, attitude, and practices (KAP) regarding the risk of cardiovascular disease (CVD) in patients attending an outpatient clinic in Kuantan, Malaysia. A total of 100 patients, including 52 males and 48 females, were selected using a convenient sampling method. The study revealed that the mean scores for knowledge, attitudes, and practices (KAP) were 60.75, 54.36, and 33.43, respectively. Regarding questions related to knowledge, 88% of subjects knew irregular eating patterns can cause disease and the benefits of vegetable intake. Most subjects recognized that smoking and obesity were CVD risk factors. Regarding questions related to attitude, 96% agreed that exercise can prevent CVD. More than half of the subjects followed a healthy lifestyle. There were statistically significant differences in knowledge level between sexes (P = 0.046) and races (P = 0.001). Nevertheless, no statistically significant difference was observed in KAP across different education levels of the subjects regarding the risk of CVD. The improvement of public information systems is crucial for society's well-being [49].

A study was conducted among 300 women in Bangladesh. The results showed that the majority (89%) was married and 99% identified as Muslim. About (49.3%) of the participants had only completed primary education that indicated the low level of women's education in Bangladesh. It was found that 56.7% of respondents had good knowledge, 8.3 percent had satisfactory knowledge, 1.7% had excellent knowledge and the remaining 29 percent had poor knowledge regarding cardiovascular diseases. Among women, 56.67% of respondents had moderately favorable attitudes, followed by 29% who were favorable. The remaining 14.33% exhibited unfavorable attitudes. This study revealed that good knowledge as well as a positive attitude towards major risk factors of cardiovascular diseases among women is unsatisfactory. To effectively prevent and control cardiovascular diseases, both government and private organizations need to implement integrated initiatives in order to minimize the problem [50].

A study was conducted among 222 patients in Bangladesh to assess knowledge, attitudes, and practices (KAP) regarding coronary artery disease (CAD). The sample was drawn from a government cardiovascular hospital representing a lower income population in Dhaka, Bangladesh. The results showed that the average Knowledge, Attitudes, and Practices (KAP) score was 21.45 ± 5.83, with a maximum possible score of 40. Only 5.86% of the participants demonstrated a high level of proficiency. While men exhibited greater knowledge, women showed more health-seeking behaviors, with a statistically significant difference between the two groups. The statistically significant correlation found between socioeconomic status (SES) and knowledge, attitudes, and practices (KAP). Targeting the short comings in KAP identified in this study would be beneficial for future preventative educational interventions [51].

A cross-sectional study conducted in Ethiopia aimed to identify knowledge and unhealthy behaviors contributing to CVD among patients with diabetes mellitus. According to the study, out of the 318 participants who were enrolled, 52.5% were under 45 years old and 58.8% were female. In the study, over half of the participants (62.3%) demonstrated good knowledge of modifiable cardiovascular disease (CVD) risk factors. The majority of participants recognized that consuming foods high in fats rather than fruits and vegetables is a risk factor for CVD (62.3%). Additionally, 61.6% identified physical inactivity as another significant risk factor. About 55.0% of the patients practiced effective measures to prevent cardiovascular diseases (CVDs). More than 80% of them avoided foods high in fat and sugar, and 78.6% refrained from smoking. The educational background and living situation of the participants influenced their knowledge and practices related to modifiable risk factors for cardiovascular diseases [52].

A study conducted in Bangladesh aimed to assess the prevalence of cardiovascular disease (CVD) among the adult population using evidence from published scientific literature. Researchers searched electronic databases, including MEDLINE, Embase, and PubMed. They initially retrieved 755 potentially relevant papers from these databases and additional gray literature. After screening, only 13 papers met the inclusion criteria and were included in the review. The studies met inclusion criteria; three were carried out in rural populations, five in both urban and rural populations, and two in strictly urban populations. Male and female participation in the studies was almost equal. The weighted pooled prevalence of CVD was 5.0%, regardless of the types of CVD, gender, and geographical location of the study participants. There was also a high heterogeneity

in the observed CVD prevalence. However, no such difference was observed in gender (3% for both males and females). The highest reported prevalence (21%) was for heart disease; while the lowest reported prevalence (1%) was for stroke. Effective strategies are essential for the primary prevention of CVD, aiming to reduce its prevalence and the associated morbidity and mortality [53].

A study was carried out in India focused on young individuals to investigate the high prevalence of cardiovascular disease risk factors, such as obesity, physical inactivity, and poor diet. These risk factors have also been observed among young people living in developed countries. The rate of substance abuse, including opioids, cocaine, electronic cigarettes, and anabolic steroids, is increasing among young adults. In contrast, cigarette smoking appears to be declining. Additionally, among younger individuals aged 18 to 50 years, the incidence of cardiovascular diseases has either remained steady or increased over the same period. This trend is opposite to that seen in adults over the age of 50, who are experiencing a decline in the incidence of cardiovascular disease. This review discussed the burden of risk factors for ischemic heart disease, heart failure, atrial fibrillation, and sudden cardiac death among young adults aged 18-45 years. Furthermore, it discusses the prevalence, incidence, and temporal trends of various cardiovascular diseases among this young segment of the population [54].

In a study conducted in the USA, researchers discussed current findings regarding the impacts of age and gender on heart disease. The aging population is particularly vulnerable to cardiovascular disease (CVD), with age serving as a significant independent risk factor. This risk is heightened by frailty, obesity, and diabetes, which complicate cardiac health. Older women face a higher risk for CVD than age-matched men, but both sexes experience increased risks as they age, linked to declines in sex hormones like estrogen and testosterone. Hormone replacement therapies typically do not improve outcomes for older adults and may increase the risk of cardiac events. It is critically necessary to uncover the impact of hormones on cardiovascular risk factors, in future clinical and research studies, to improve outcomes in the older population [55].

The American Heart Association (AHA) reports that the prevalence of cardiovascular disease (CVD) in men and women in the United States is 40% for those aged 40-59, 75% for those aged 60-79, and 86% for individuals over 80. Consequently, older adults represent a significant burden on the U.S. healthcare system due to the high rates of CVD. This burden is closely tied to increased mortality, morbidity, and frailty among affected individuals, which in turn leads to substantial overall healthcare costs. With the aging U.S. population projected to grow by two to three times by 2050, there is an urgent need for a deeper understanding of the factors contributing to CVD in older adults [55-56].

In the AHA 2019 Heart Disease and Stroke Statistical Update, the incidence of cardiovascular disease (CVD) was reported to be 77.2% in males and 78.2% in females aged 60 to 79. Additionally, for adults over 80, the incidence of CVD was reported at 89.3% in males and 91.8% in females. Regarding coronary artery disease (CAD), the most significant risk factors are male gender and advanced age [57].

A study conducted in Spain analyzed biochemical and endocrine influences, as well as gender differences, affecting the origin and development of cardiovascular disease. This study highlights that sex differences play a significant role in the disparities regarding cardiovascular disease (CVD) risk factors and outcomes between men and women. These variances can largely be attributed to sex hormones and their respective receptors. Notably, the differences in cardiac risk factors observed in premenopausal versus postmenopausal women have led to extensive research on estrogen (E2) and its potential protective effects on heart health. Throughout an individual's lifespan, exposure to sex hormones influences various endocrine factors associated with atherosclerosis [58].

Methods

Study Design: A descriptive cross-sectional study design was used to determine the knowledge and attitude toward cardiovascular disease among young adults. The study was conducted from July to October 2023.

Study Participants: The current study population was all cardiac patients in Dhaka, Bangladesh. The setting is Dhaka Medical College Hospital (DMCH) in Dhaka, Bangladesh. Those young adults who developed cardiovascular disease and were present during data collection participated in this study.

Dhaka Medical College Hospital (DMCH) is the oldest tertiary-level hospital situated in the heart of Dhaka, Bangladesh. The hospital has multiple departments, offering both indoor and outdoor services. A significant number of patients are admitted to DMCH, making it an appropriate setting for drawing a sample that represents young patients with cardiovascular disease across Bangladesh.

A convenience sampling method was used to select the study sample. The sample size for the study was calculated using the following formula:

$n=z^2pq/d^2$

Where,
n=desired samplesize
z=1.96(for a 95% confidence interval)
p=prevalence=54.36%=.543 [49]
q= (1-p)

(Mohammad NB, Rahman NA, Haque M. Knowledge, attitude, and practice regarding the risk of cardiovascular diseases in patients attending outpatient clinic in Kuantan, Malaysia. Journal of pharmacy &bioallied sciences. 2018 Jan; 10 (1): 7.)
d=0.05(errorlevel 5%)
p=0.543(54.36%prevalence)
q=(1-0.543) =0.457
$=(1.96)^2\times0.543\times0.457\div(0.05)^2$
n= 0.953/ 0.0025
=381.3

Due to inadequate time, source, and financial limitation researcher collected 381 samples with the consent of the guide.

Instruments: A pre-tested, modified semi-structured questionnaire was used to collect the data through interviews. It consists of three parts including Section A: Socio-Demographic Questionnaire (SDQ): This part was designed by the researchers based on literature review and experts' opinion. This questionnaire consists of 09 items. Section B: Knowledge regarding CVD-related information consists of 16 items and Section C: Attitude toward prevention of CVD-related information consists of 10 items.

Data Collection Methods: The researcher was introduced to the study participants and explained the study purpose, data collection procedure, and benefit of this study and asked for their cooperation. Confidentiality, anonymity, and privacy of the data provided by the participants were strictly maintained by using a coding system.
The participants were informed by the researcher that they had full right to withdraw from the study at any time without any obligation. The researcher obtained written consent from the participants. The researcher collected data in a Bengali version. It took approximately 25-30 minutes to complete the question. During return back, the researcher checked the questionnaire for its completeness; if anything missing, the researcher requested the participants to make it completed.

Data Management and Analysis: All collected data were carefully cleaned and entered into a data sheet using SPSS version 25. The data underwent thorough checks and rechecks for clarity, and manual edits were made to ensure consistency, thereby reducing the potential for errors. Frequency and percentage analyses were conducted on the demographic information, while mean, median and standard deviation were employed to assess urinary incontinence among the women. The findings are presented using percentages, tables, graphs, and charts.

Results

The descriptive cross-sectional study was conducted to determine the Knowledge and attitude toward cardiovascular disease among young adults at a selected hospital in Dhaka, Bangladesh with a sample size of 381. A pre-tested, modified semi-structured questionnaire was used to collect the data. A convenience sampling method was used. Section-A: Socio-demographic Information of the participants; Section-B: Cardiovascular diseases related variables. All the data were entered and analyzed by using statistical packages for social science (SPSS) software.

Table 1: Distribution of the participants by age (n=381)

Age(in years)	Frequency	Percent
18-24	57	14.9
25-30	132	34.6
31-34	192	50.4
Total	381	100.0
Mean±SD	27.01±10.41	

This table finds that 50.4%, 34%, and 14.9% of the participants were in the age group 31-34 years, 25-30 years, and 18-24 years respectively with them age 27.01±10.41 years

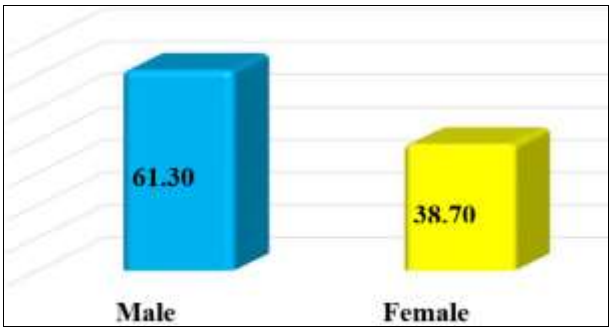

Fig 1: Distribution of the participants by gender (n=381)

This figure finds that, majority 61.3% of the participants were male and rest 38.7% of the participants were female.

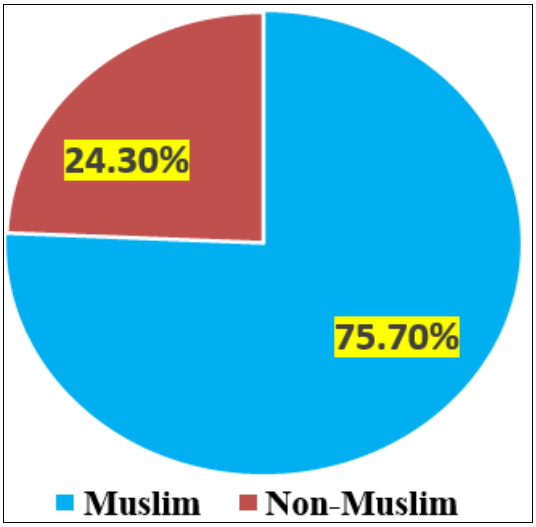

Fig 2: Distribution of the participants by religion (n=381)

This figure shows that, majority of the participants (75.7%) were belongs to Muslim family and rest 24.3% of the participants were belongs to non-Muslim family.

Fig 3: Distribution of the participants by marital status (n=381)

This figure shows that more than sixty percent (67.8%) of the participants were married, and above one-third (32.2%) of the participants were unmarried.
This figure reveals that more than six-tenths (65.3%) of the participants were living in rural areas and the rest 34.7% of the participants were living in urban areas.

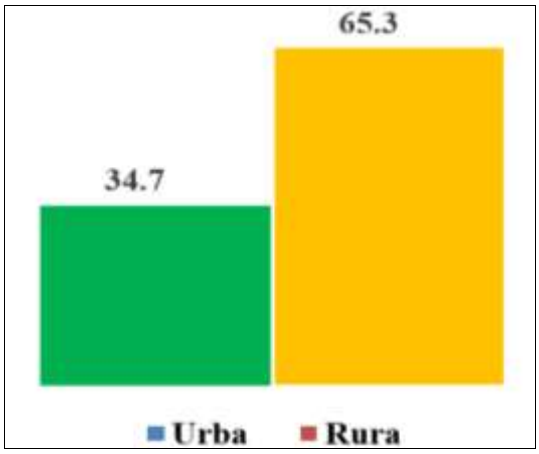

Fig 4: Distribution of the participants by residence (n=381)

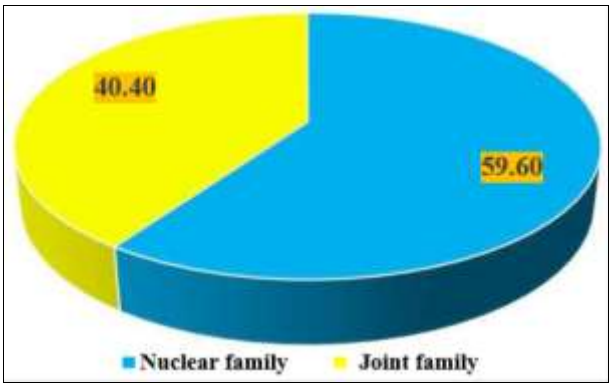

Fig 5: Distribution of the participants by types of family (n=381)

This figure shows that nearly sixty percent (59.6%) of the participants were living in joint families and the rest 40.4% of the participants were living in a nuclear family.

Table 2: Distribution of the participants by educational qualification (n=381)

Educational qualification	Frequency	Percent
Illiterate	53	13.9
Up to primary	96	25.2
Secondary	115	30.2
Higher secondary	69	18.1
Graduate or above	48	12.6
Total	381	100.0

This table finds that 30.2%, 25.2%, 18.1%, 13.9%, and 12.6% of the participants were completed secondary level, up to primary, higher secondary, illiterate and graduation or above level of education respectively.

Table 3: Distribution of the participants by occupation (n=381)

Occupation	Frequency	Percent
Housewife	105	27.6
Daylabor	133	34.9
Teacher	47	12.3
Businessman	19	4.9
Banker	12	3.1
Shopkeeper	41	10.8
Others	24	6.3
Total	381	100.0

This table shows that 34.9%, 27.6%, 12.3%, 10.8%, 6.3%, 4.9%, and rest 3.1% of the participants were day labor, housewife, teacher, shopkeeper, others profession, business man and rest banker respectively.

Table 4: Distribution of the participants by monthly family income (n=381)

Monthly family income (BDT)	Frequency	Percent
<10000	206	54.1
10000-20000	108	28.3
>20000	67	17.6
Total	381	100.0

This table finds that 54.1%, 28.3% and17.6% of the participants had monthly family income less than 10000 BDT, 10000-20000 BDT and rest more than 20000 BDT respectively.

Table 5: Distribution of the participants by knowledge regarding CVD and its risk factors (n=381)

Statement	True n (%)	False n (%)	Don't know n (%)
Cardiovascular is related to heart	133(34.9)*	45(11.8)	203(53.3)
Cardiovascular is not related to obstructed blood vessels	51(24.1)	22 (5.8)*	308 (80.8)
Cardiovascular is the leading cause of death in Bangladesh	92 (24.1)*	13 (3.4)	276 (72.4)
Cardiovascular is the disease of young people only	23 (6.1)	52 (13.6)*	306 (80.3)
Light walking can prevent CVD	65 (17.1)	63 (16.5)*	253 (66.4)
Irregular eating patterns bring harm	55 (14.4)*	41 (10.8)	96 (25.2)
HDL is a good cholesterol	13 (3.4)*	9 (2.4)	359 (94.2)
House work is enough exercise per day	87 (22.8)	17 (4.5)*	275 (72.1)
Adequate exercise prevents CVD	105 (27.6)*	56 (14.7)	220 (57.7)
BMI>30 is considered obese	63 (16.5)*	74 (19.4)	244 (64.1)
Fruit and vegetables prevent CVD	44 (11.5)*	33 (8.7)	304 (79.8)
Most CVD cases are hereditary	112 (29.4)	56 (14.7)*	213 (55.9)
Controlling high-fat food is essential to prevent CVD	92 (24.1)*	29 (7.6)	260 (68.2)
Tobacco cessation program is available	14 (3.7)*	19 (4.9)	258 (67.7)
Slender people do not need to exercise	64 (16.8)	16 (4.2)*	301 (79.0)
Prayer can reduce stress	77 (20.2)*	44 (11.5)	260 (68.2)

This table finds that 34.9%, 27.6%, 24.1%, 20.2%, 16.5%, 14.4%, 3.4%, 11.5%, 24.1%, and 3.7% of the participants gave correct answers about the true statement that cardiovascular is related to the heart, Adequate exercise prevents CVD, cardiovascular is the leading cause of death in Bangladesh, Prayer can reduce stress, BMI > 30 is considered obese, Irregular eating patterns bring harm, HDL is a good cholesterol, Fruit and vegetables prevent CVD, Controlling high-fat food is essential to prevent CVD, tobacco cessation program is available respectively. On the other hand, 16.5%, 14.7%, 13.6%, 5.8%, 4.5%, and 4.2% of the participants gave correct statements regarding light walking can prevent CVD, most CVD cases are hereditary, Cardiovascular is the disease of young people only, Cardiovascular is not related to obstructed blood vessels, housework is enough exercise per day, slender people do not need to exercise respectively.

Table 6: Distribution of the participants by responses on question regarding CVD risk factors (n=381)

CVD risk factors	Yes n(%)	No n(%)
Diseases		
Hypertension	245(64.3)	136(35.7)
High blood cholesterol	193(50.7)	188(49.3)
Cancer	215(56.4)	166(43.6)
Genetic factors	105(27.6)	276(72.4)
Diabetes mellitus	274(71.9)	107(28.1)
Heart attack	296(77.7)	85(22.3)
Asthma	163(42.8)	218(57.2)
Stroke	241(63.3)	140(36.7)
Conditions		
Stress	284(74.5)	97(25.5)
Sedentary lifestyle	249(65.4)	132(34.6)
Smoking	165(43.3)	216(56.7)
High-abdominal fat	214(56.2)	167(43.8)
Obesity	283(74.3)	98(25.7)
Physicalin activity	314(82.4)	67(17.6)
Advancing age	323(84.8)	58(15.2)
Diet	196(51.4)	185(48.6)

This table shows that 77.7%, 71.9%, 64.3%, 63.3%, and 50.7% of the participants gave correct answers regarding heart attack, diabetes mellitus, hypertension, stroke, and high blood cholesterol are the risk factors of cardiovascular disease respectively. On the other hand, 84.8%, 82.4%, 74.5%, 74.3%, 65.4%, 56.2%, 51.4%, and 43.3% of the participants answered advancing age, physical inactivity; stress, obesity, sedentary lifestyle, high- abdominal fat, diet and smoking are aggravating factors of cardiovascular diseases respectively.

Table 7: Distribution of the participants by attitude toward prevention of CVD (n=381)

Statement	AgreeaN%	Neutral N%	DisagreebN%
Stop Smoking	187(49.1)*	139(36.5)	55(14.4)
Doing exercise	192(50.4)*	96(25.2)	93(24.4)
Prefer walking to go somewhere near	218(57.2)*	96(25.2)	67(17.6)
Maintain BMI	69(18.1)*	271(71.1)	41(10.8)
Fruit and/or vegetables intake help to reduce CVD	132(34.6)*	234(61.4)	15(3.9)
Take less oily food	88(23.1)*	260(68.2)	33(8.7)
Control stress to prevent illness	105(27.6)*	253(66.4)	23(60.0)
CVD patients need regular medical checkup	213(55.9)*	145(38.1)	12(3.1)
Prefer fast food	32(8.4)	148(38.8)	201(52.8)*
Prefer lazing around than exercise	41(10.8)	121(31.8)	219(57.5)*

A Combined response of "strongly agree" and "agree."
B Combined response of "strongly disagree" and "disagree."

This table finds that, 49.1%, 50.4%, 57.2%, 34.6%, 57.5%, 55.9%, 52.8%, 27.6%, 23.1% and 18.1% of the participants agreed on a statement of stopping smoking, doing exercise, preferring walking to go somewhere near, CVD patients need regular medical checkups, fruit and/or vegetable intake help to reduce CVD, controlling stress to prevent illness, taking less oily food and maintain BMI respectively. On the other hand, 57.5% and 52.8% of the participants strongly disagreed and disagreed with a statement of prefer lazing around than exercise and prefer fast food.

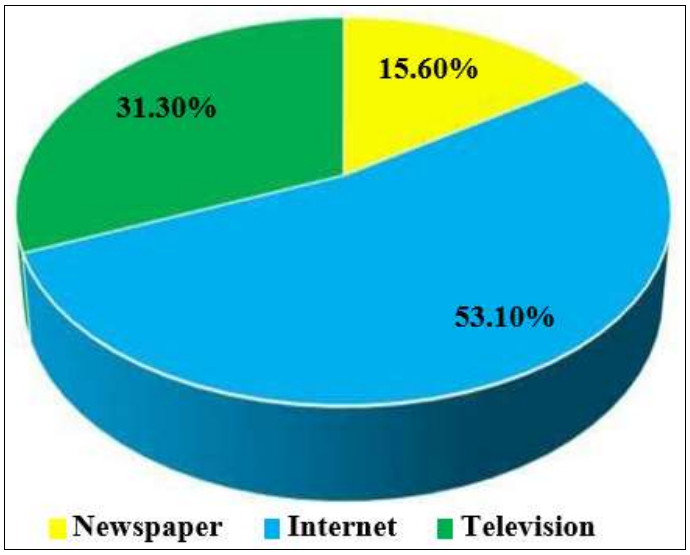

Fig 6: Distribution of the participants by source of information (n=381)

This figure shows that 53.1%, 31.3%, and 15.6% of the participants learned about cardiovascular diseases from the Internet, television, and newspapers, respectively.

Discussion

The descriptive cross-sectional study was conducted to determine the Knowledge and attitude toward cardiovascular disease among the young adults at a selected hospital in Dhaka, Bangladesh with a sample size 381. A pre-tested modified interviewer-administered semi-structured questionnaire was used to collect the information. A convenience sampling method was used. Section A: Socio-demographic Information of the participants; Section B: Cardiovascular diseases related variables. All the data were entered and analyzed by using Statistical Package for Social Science (SPSS) software. The findings of the present study showed that 50.4% of the participants were in age groups 31-34 years. This finding was quite similar to a study conducted in USA (George *et al*., 2021) [59]. This result is incongruent with another study that found the CVD risk factor was higher in the age group ≥60 yrs (Vatsa *et al*., 2021) [60]. The majority (61.3%) of the participants were male, and the rest 38.7% of the participants were female. A similar study by Sy *et al*. (2018) found that most of the participants were male [61]. This result is dissimilar with a study conducted in Iran found that 50.0% of the participants were female (Estebsari *et al*., 2024) [62]. Majority of the participants (75.7%) belonged to Muslim families, and the rest 24.3% of the participants belonged to non-Muslim families, more than six-tenths (67.8%) of the participants were married, and rest more than one-third (32.2%) of the participants were unmarried, above sixty percent (65.3%) of the participants were living in a rural area, and rest 34.7% of the participants were living in an urban area. This study is similar with the study conducted by Mohammad *et al*. (2018) [49].

The current study revealed that the majority of the participants (59.6%) were living in joint families, and the rest of the participants (40.4%) were living in nuclear families. This finding is similar with another study in USA by Rasooly *et al*. (2024) [63].

This study showed that 34.9%, 27.6%, 12.3%, 10.8%, 6.3%, 4.9%, and rest 3.1% of the participants were day labor, housewife, teacher, shopkeeper, others profession, business man and rest banker respectively. This result is congruent with the study in Philippines conducted by Sy *et al*. (2018) [61]. The present study showed that had monthly family income less than 10000 BDT, 10000- 20000 BDT and rest more than 20000 BDT respectively. This study is dissimilar with the study carried out by Hoq *et al*. (2017) [50].

This study found that 34.9%, 27.6%, 24.1%, 20.2%, 16.5%, 14.4%, 3.4%, 11.5%, and 24.1% and 3.7% of the participants, respectively gave correct answers about true statements regarding cardiovascular health related to the heart. Adequate exercise prevents CVD; cardiovascular is the leading cause of death in Bangladesh. Prayer can reduce stress; BMI > 30 is considered obese. Irregular eating patterns bring harm; HDL is good cholesterol. Fruit and vegetables prevent CVD, Controlling high-fat food is essential to prevent CVD; a tobacco cessation program is available, respectively. This study findings is similar with the study carried out by Trejo *et al*. (2018) [64].

The current study revealed that 16.5%, 14.7%, 13.6%, 5.8%, 4.5% and 4.2% of the participants' gave correct answers regarding light walking can prevent CVD, most CVD cases are hereditary, cardiovascular is the disease of young people only, cardiovascular is not related to obstructed blood vessels, house work is enough exercise per day, slender people do not need to exercise respectively. This study finding is dissimilar with the study carried out by Mirza *et al*. (2016) [51].

This study showed that 49.1%, 50.4%, 57.2%, 34.6%, 57.5%, 55.9%, 52.8%, 27.6%, 23.1%, and 18.1% of the participants agreed on a statement of stopping smoking, doing exercise, preferring walking to going somewhere nearby, CVD patients need regular medical checkups, fruit, and vegetable intake helps to reduce CVD, control stress to prevent Illness, take less oily food and maintain BMI respectively. On the other hand, 57.5% and 52.8% of the respondents were strongly disagreed and disagreed with a statement of prefer lazing around than exercise and prefer fast food. The result is consistent with another study conducted by Majumder *et al*. (2019) [65].

Conclusions

Regarding CVD risk factors, the population is said to have good knowledge and attitudes. Nonetheless, the proportion of smokers is notably large, accounting for one-third of the sample population. Furthermore, the subjects' practice was still subpar. While there was no discernible difference in the degree of awareness about CVD risk across academic levels, there were notable differences in the level of information about CVD between genders and ethnicities. In contrast, there were no appreciable differences in attitude or practice between racial groups, genders, or educational attainment. Consequently, it is critical to know the population's KAP to take positive action.

Recommendations

Based on the findings, there are some recommendations following:

1. More awareness programs could be organized and information could be disseminated through media, newspapers, magazines, television, and the Internet.
2. Adequate administrative support may be provided to conduct such activities.
3. Periodic surveys should be conducted to find out the prevalence or severity of fractureand causative factors.
4. A larger sample size will be recommended for future research.

Conflict of Interest

Not available

Financial Support

Not available

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How to Cite This Article
Khanam S, Khatun S. Knowledge and attitude regarding cardiovascular disease among young adults' attending of a selected tertiary level hospital in Dhaka city, Bangladesh. International Journal of Advance Research in Nursing. 2024;7(2):294-305.