PREVALENCE AND AWARENESS REGARDING RISK FACTORS OF CARDIOVASCULAR DISEASES AMONG COLLEGE GOING STUDENTS OF A SELECTED COLLEGE, MANIPUR

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ABSTRACT

Cardiovascular Diseases are the number one cause of death globally. Risk factors associated with cardiovascular diseases in young adults is often underestimated despite the high prevalence. A descriptive survey study was conducted among the students of a selected College, Manipur, with the objectives of assessing the prevalence of risk factors of cardiovascular diseases, determining the awareness regarding risk factors of cardiovascular diseases and finding the association between awareness regarding risk factors of cardiovascular diseases with selected socio-demographic variables. 100 subjects were selected by purposive sampling technique. Data regarding socio-demographic characteristics were collected using a structured questionnaire. To assess the prevalence of risk factors of cardiovascular diseases, data were collected using a structured questionnaire and the tool was prepared on the basis of WHO STEPS instrument and healthy heart questionnaire. After assessing the prevalence of risk factors, awareness level regarding risk factors was assessed using a structured questionnaire. Validity and reliability of the tool was established before final data collection. The findings of the study revealed that the most common risk factors present among the students were inadequate intake of fruits (68%), exposure to passive smoking (64%) and inadequate physical activity (60%). Majority of the students (74.23%) have 3 or more risk factors. Most of the students (72%) have an average level of awareness regarding risk factors of cardiovascular diseases. The study findings show high prevalence of risk factors among the students. This shows the need of awareness and motivation to adopt healthy lifestyle especially in younger population group.

Keyword: Cardiovascular diseases, prevalence, risk factors, awareness, college going students.

INTRODUCTION

Cardiovascular Diseases are the number one cause of death globally, more people die from cardiovascular diseases than from any other cause[1]. Over three quarters of deaths that takes place in low and middle-income countries are due to cardiovascular diseases. Out of the 17 million premature deaths due to non-communicable diseases in 2015, 37% are due to cardiovascular diseases[1]. In 2016, the estimated prevalence of cardiovascular diseases in India was 54.5 million. One in 4 deaths in India are now because of cardiovascular diseases and >80% are due to ischemic heart disease and stroke. The major behavioral cardiovascular diseases risk factors include tobacco use, unhealthy diet, obesity, physical inactivity and alcohol use[1].

According to a review study done by Joyeta Ghosh[2], it was found that there was high prevalence of obesity among Indian college going students which varies from 10% to 56%; smoking among college students of India varies from 6% to 32%; current alcohol consumption among college student varies from 79% to 25%; high prevalence of Metabolic Syndrome varying from 5% to 18.3 %. The study provides the evidence of the persistence of CHD risk factors among college going students.

In a cross sectional study conducted by Karl Petzer and Supa Pengpid[3]in Nine ASEAN (The Association of Southeast Asian Nations) countries, a high prevalence of behavioural risk factors of Cardiovascular Diseases was found. According to the study, among male and female students, 27.5% and 16.9%, were overweight or obese, 39.0% and 53.0% engaged in low physical activity, 6.9% and 2.5% were current tobacco users, 10.1% and 4.2% had engaged in binge drinking in the past month.[3]

Evidence suggests the presence of one or more cardiovascular diseases risk factors like obesity, inadequate physical activities, hypertension etc among adolescents. Moreover, many of the college students are directly or indirectly exposed to the risk factors of developing cardiovascular diseases[4].

Many young adults have at least 1 Cardiovascular Diseases risk factors. 80 % of heart diseases are preventable through diet and lifestyle. More than one-third of adults in India (35%) use tobacco, with prevalence rates varying from 9% in Goa to 67% in the northeastern state of Mizoram[5]. Tobacco use is increasing rapidly among young individuals (20–35 years) in India .The early onset of Cardiovascular Diseases among Indians and the high case fatality attributable to Cardiovascular Diseases is ominous and needs special attention[6].

Gupta Ekta and Mahanta Goswami Tulika[7] conducted a cross-sectional study at Dibrugarh, Assam. The study showed the presence of overweight, hypertension, tobacco use, fewer intakes of vegetables, fast food items intake and physical inactivity for 30 min for < 3 days/week. The study revealed a high prevalence of various risk factors among boys and girls.

There is high prevalence of risk factor like physical inactivity among students of Manipur[8]. In a study conducted by Ningombam S[9]there showed high prevalence of tobacco and alcohol use among students of Manipur.

Many young adults are under the risk of developing cardiovascular diseases. Surprisingly, 4% to 10% of heart attacks occur before the age of 45. Other coronary artery disease also develops in young adults, out of which 80% are heart attacks. Mostly smoking and obesity also increased the risk of cardiovascular diseases in adolescents and young adults[10].

Behavioural changes in college student include a decrease in exercise and activity levels and an increase in sitting or sedentary time. Other changes include changes in eating and sleeping patterns, increased stress, weight fluctuations, tobacco, alcohol and drug use. These typical college students' behaviors have the potential to become cardiovascular disease risk factors and further develop into Cardiovascular Diseases during adult years[11]. Controlling these risk factors in early adulthood will help reduce the risk of developing heart disease.

Prevention of any associated factors is the main step in this age group by adopting healthy lifestyle. It is high time to motivate students to choose healthier options; healthy choices, nutritional information needs to be provided. Students need to be aware regarding the risk factors which may lead to cardiovascular diseases so that they can recognize the faulty behaviors adopted and address the immediate need of changing the particular behavior. Especially in north eastern states of India like Manipur, Assam, Mizoram, Arunachal Pradesh, Nagaland, Meghalaya etc there is need for improved risk assessment. So, with a view of understanding one's knowledge regarding risk factors as an important step in reducing the risk factors of cardiovascular disease, the study aims to assess the prevalence and awareness regarding risk factors of cardiovascular diseases among college going students. The objectives of the study are 1. To assess the prevalence of risk factors of cardiovascular diseases among college going students. 2. To determine the awareness regarding risk factors of cardiovascular disease among college going students. 3. To find out the association between awareness regarding risk factors of cardiovascular diseases with selected socio-demographic variables.

MATERIALS AND METHODS

Descriptive survey research design was used in this study. A non-probability purposive sampling was used to select 96 college students who are willing to participate in the study and who can read, write and understand English and Manipuri, excluded; college going student who already have cardiovascular diseases. Structured self-administered demographic Performa for each subject was used. Structured questionnaire, physical assessment performa and biochemical assessment was done to assess prevalence of risk factors of cardiovascular diseases and this tool was based on WHO STEPS instrument and healthy heart questionnaire. These questioners were validated by 7 experts. Reliability of the tool was found by test-re-test method and the Kappa value for each item after test-retest ranges from 0.83 to 1. Reliability of BP instrument (Nuton): Already calibrated BP instrument was used. Same machine was used for every student. Already calibrated weighing machine was used. Same machine was used for every student. Calibrated glucometer (Onetouch) was used. Same glucometer was used for every student. Reliability of the physical measurements like body weight, height, waist circumference, blood pressure, and biochemical measurement (RBS) was done through inter-observer agreement and it was 1 for all the aspects. Reliability of the awareness tool was established using KR-20 for establishing the internal consistency. The value was 0.90 and hence the tool was considered reliable. Ethical clearance was obtained from Institutional Ethics Committee, informed consent obtained from the participants and confidentiality and anonymity of the participants was maintained. Assessment of cardiovascular risk was done according to WHO criteria. Frequency and percentage distribution for identification of risk factors of CVD and comparison of the presence of risk factors among male and female was done Prevalence status was calculated by identifying number risk factors present in students. For administration tool was converted into Manipuri language and linguistic validation was done by linguistic experts. Frequency and percentage distribution was done for finding out the level of awareness regarding risk factors of cardiovascular diseases was done and domain-wise range of score, mean score, mean percentage score & rank done. Chi square test was done to determine the association between awareness regarding risk factors of cardiovascular diseases with selected socio-demographic variables. Statistical descriptions and test above were performed using SPSS version 22, value of less than 0.05 was considered significant.

RESULTS

Table 1 A depicts that maximum (46%) of the students are between the age of 21 – 23 years, male and female are equal in number, most (88%)of the students are unmarried, majority (73%) of the students belong to nuclear family, maximum (52%) of the students are Meitei, maximum (57%) of the students are from the region of Imphal East, maximum(49%) of the students are studying Bachelor of Arts, maximum(53%) of the students are studying in 3rd year, maximum(55%) of the students belong to Middle class economic status and maximum(42%) of the students' parents are Farmers. Table 1 B shows that maximum (58%) of the students knows about cardiovascular diseases and only 22% of the students receive information through Radio/Television.

Figure 1 shows that majority (68%) of the students consumes inadequate fruits, majorities (64%) of the students are exposed to passive smoking, and majorities (60%) of the students have inadequate physical activity. Very few (21%) of the students are current smoker and only 17%of the students are consuming extra salt.Fig.2 shows that only 20% of the students have family history diabetes and 26% of the students have family history of hypertension. A very few (4%) of the students have elevated BP (blood pressure), only 3% of the students are having stage I hypertension and 4% of the students are having Diabetes. Figure 3 shows that out of the 68% of students who consume inadequate fruits, 32% of the students are female and 36% of the students are male students respectively. Among 60% of the students who have inadequate physical activity, 23% of the students are female and 37% of the students are male students. Out of 21% of the students who are current smoker, only 1% is female and 20% are male students. All the 21% of the students who are current alcohol user are male students.

Fig-4 reveals that family history of diabetes is present in 20% of the students and out of them 12% female and 8% male. Among 26% of the students who have family history of hypertension 15% of the students are female and 11% of the students are male. Only 4% of the students are having Diabetes where 1% is female student and 3% male students. Fig. 5 depicts that majority (66%) of the students have 3-5 risk factors and a very few (3%) students are with 0 risk factors. Fig.6 shows that there is high prevalence of risk factors (≥3 risk factors) in majority (74.23%) of the students and only 25.77% of the students have 1-2 risk factors. Fig.7 depicts that majority (72%) have average level of awareness regarding risk factors of cardiovascular disease , only 20% of the students have poor level of awareness and only 8% of the students have good level of awareness regarding risk factors of cardiovascular disease.

Table-2 shows that most (81.2%) of the students are aware regarding inadequate physical activity and majority (71.57%) of the students area were regarding inadequate dietary pattern. Only 34.5% of the students are aware regarding diabetes and 29% of the students have awareness regarding gender. Table 3A shows that there is statistically significant association between occupation of parents with level of awareness regarding risk factors of cardiovascular diseases. The other demographic variables had not shown any statistically significant association with level of awareness regarding risk factors of cardiovascular diseases among college going students. Table 3B depicts that there is statistically significant association between previous knowledge about CVD/heart diseases with level of awareness regarding risk factors of cardiovascular diseases at p<0.05 with chi-square value of (χ^2=8.855, p=0.003).

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DISCUSSION

We found that among the students of selected college, Manipur, there is high prevalence of inadequate physical activity in 60% of the students. This is consistent with the study conducted by Masjid Gholipour and Arezoo Tabriji[12]where 60.09% of the students were physically inactive. The high prevalence is also consistent with another study conducted by Mohammed Ismail, Venugopalam PP, Sarada AK, Kanniyar Binub[13] at Kerala where 56.6% of the students are having lack of exercises. Inadequate physical activity of the students may be due to the pandemic situation. In the present study, majority of the students (68%) have inadequate intake of fruits which is less than the recommended daily consumption of fruits by WHO. On contrary, the prevalence of inadequate intake of fruits was lower among college going women in Chennai with only 21% subjects consume inadequate fruits[14]. The high prevalence of inadequate fruit intake in the present study may be due to lack of awareness regarding importance of fruits and non affordable price of seasonal fruits in market.

The prevalence of inadequate intake of vegetables was found in 37% of the students. In contrast to this study, in a study conducted by Gupta Ekta and Mahanta Goswami Tulika[7] at Assam, majority (87.5%) of the students consume inadequate intake of vegetables. The present study is also inconsistent to another study in Africa[15] where 99% sample have inadequate intake of vegetables consumption The low prevalence in the present study is due to easy availability of local vegetables and habit of eating vegetable mostly in the state.

In the current survey, consumption of extra salt was found only in 17% of the students. However in a study conducted in Kerala[13] high salt intake was found in 78.5% of the students. Also extra uncooked salt intake was reported to be high in boys (35.6%) and girls (33.3%) in a study conducted in Assam. The low prevalence in the present study may be due to their awareness regarding side effects of excessive salt or may be because of the food habit of the particular region.

The prevalence of consumption of junk foods are low (27%) as compared to the study conducted by Mohammed Ismail et all[13] which shows consumption of junk food 65.9% and also with the study Biswajit Paul & Mousumi[7] Sen where 91.3% of the students ate junk foods. The high prevalence was also seen in another study conducted by Gupta Ekta and Mahanta Goswami Tulika[7] at Assam. The low consumption of junk foods in the present study may be due to unavailability of the particular food because of the situation; lockdown and pandemic. Regarding current smoker and current smokeless tobacco user, 21% of the students are current smoker and current smokeless tobacco user respectively. This is consistent with study conducted by Rajak Mohammed Ibrahim et al[17] at Tamil Nadu where 26% of the students were smokers. Whereas low prevalence was also found in studies conducted by Vaishnav Natarajan et al[14] where only 3% of the subjects used tobacco products. It is also consistent with a review study was done by Joyeta Ghosh[2] where smoking among college students of India varies from 6 to 32%. Smoking habits of the students may be due to peer group influence among the group. Nonsmokers who used to exposed to passive smoking at home or at work increase their risk of developing heart disease by 25–30%[18]. In our present study 64% of the students are directly or indirectly exposing to passive smoking. This is inconsistent with a study in Southern India where 42% students are exposed to passive smoking[19].

The current alcohol use which we found in our present study (21%) is consistent with one of the study conducted at Tamil Nadu[17] where 25.5% of the students consume alcohol. These findings are also consistent with the study done by Nansseu JR, Kameni BS, Assah FK[15] among African young adults where 26.7% young adults consumed alcohol.

Considering the clinical risk factors, only 4% of the students have elevated BP and 3% of the students have stage I hypertension. But findings of the studies [13,16] reported higher number of hypertension among students whereas stage I hypertension is consistent with another study[15] where 2.8% of students are having hypertension rather than prehypertension. Also in the present study Diabetes is present in 4% of the students which is consistent with a study conducted by Tarun Rao[20].

It has been shown that central obesity with general obesity have an elevated risk of cardiovascular diseases[21]. In the present study, only 6% of the students have central obesity. This is inconsistent with other study findings[15,22] which shows higher prevalence of abdominal obesity. The inconsistency may be due to eating pattern and consciousness about disadvantages of weight gain among students in the area.

Only 9% of the students have preobesity and 4% have obesity class I. This is supported by a study[23] where 7.74% were under preobesity and 3.98% obese. On the other hand, findings of the study [22,20,4] reported higher prevalence of preobesity and obesity. The difference in the present study may be due to lifestyle difference and eating pattern in the state.

Family history of both hypertension and diabetes is also one risk factor of cardiovascular diseases. Individual who have family history of cardiovascular diseases are having almost all risk factors like family history of hypertension, diabetes. In consistent with other study[24], our study reveals the presence of family history of diabetes and hypertension in 20% and 26% of the students respectively.

Family history of CVD is one major risk factor of cardiovascular diseases. 8% of students have family history of CVD. On the contrary there is high prevalence of family history of CVD in a study conducted by Biswajit Paul, Mousumi[16]. The difference may be due to difference in parents' age with unidentified risk and health conscious behavior among working parents.

The most common risk factors present in the study are inadequate physical activity (60%), inadequate intake of fruits (64%) and exposure to passive smoking (68%). This is found to be consistent with a study conducted by Vaishnav Natarajan[14] where only 21% subjects consume adequate fruits and vegetables, recommendation of exercise of atleast 150 min/wk was done only by 12 % subjects. But inconsistent with a study in Nepal[12] where most common risk factors found were triacylglycerol in 47.5% and family history of hypertension in 45.5%. 28.3% of the participant had obesity. This is also inconsistent with other study.[16]

In the present study, 74.23% of the students have atleast 3 or more risk factors which shows high prevalence of risk factors among students. This is consistent with another study done by Masjid Golipour[12] among Shariff university students where majority of the student (87%) have more than 2 risk factors. This is also consistent with another studies [25,26]. Another study conducted in

Jordan among university students[27] shows the same consistency with the present study. The high prevalence may be due to independent behavior of the students and change in behaviour of the students due to their age group where one can influence each other easily.

Despite of the high presence of risk factors, most of the students (72%) have average level of awareness regarding risk factor of cardiovascular diseases. This may be due to not perceiving themselves at risk for cardiovascular diseases. This is inconsistent with the study conducted by KD Yadav[28] among adolescent students in Kathmandu district where only 55.6 percent had average knowledge. It is also inconsistent with another study done in Kerala[29].The inconsistency may be due to difference in classes of the students. But, it is found to be consistent with another study conducted in Tamil Nadu[30]. The present study reveals that most students (81.2%) have good awareness regarding physical activity and regarding dietary pattern (71.57%). This is consistent with a study conducted by Kanimozhi Sadasivam[30] et al where knowledge on physical activity was 86.1% and dietary habits 80.4% respectively.

The study reveals that there is significant association between occupation of parents with level of awareness regarding risk factors of cardiovascular diseases at $p<0.05$. There is also significant association between previous knowledge about CVD/heart diseases with level of awareness regarding risk factors of cardiovascular diseases at $p<0.05$. This is inconsistent with study conducted by KD Yadav[28] where Sources of health information was found statistically significant with level of knowledge among the students. The inconsistency may be due to the sampling technique i.e purposive sampling technique and small sample size. Due to lack of related published article, more discussion is not possible.

Limitation: The has limitation too. Firstly, the study was limited to a small sample size. So, generalization is limited. The study was limited only during college hours. Biophysical measurement was limited only to Random blood sugar. The main strength of the study was it conducted at institutional level. So, it gives a vivid image of the students' behavior and explores their awareness.

CONCLUSION
There was high presence of behavioral risk factors like physical inactivity, inadequate intake of fruits and exposure to passive smoking. Despite of younger age, there was presence of diabetes and hypertension among the students. Students are having average level of awareness regarding risk factors of cardiovascular diseases. Ironically, students fail to adopt healthy lifestyle behaviours. Hence screening along with awareness programmes regarding cardiovascular diseases and its risk factors is the crucial step in this present scenario.
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Conflict of interest: None

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RESULTS (TABLES & FIGURES)

Table 1 A: Frequency and percentage distribution of socio-demographic characteristics of college going students.   n=100
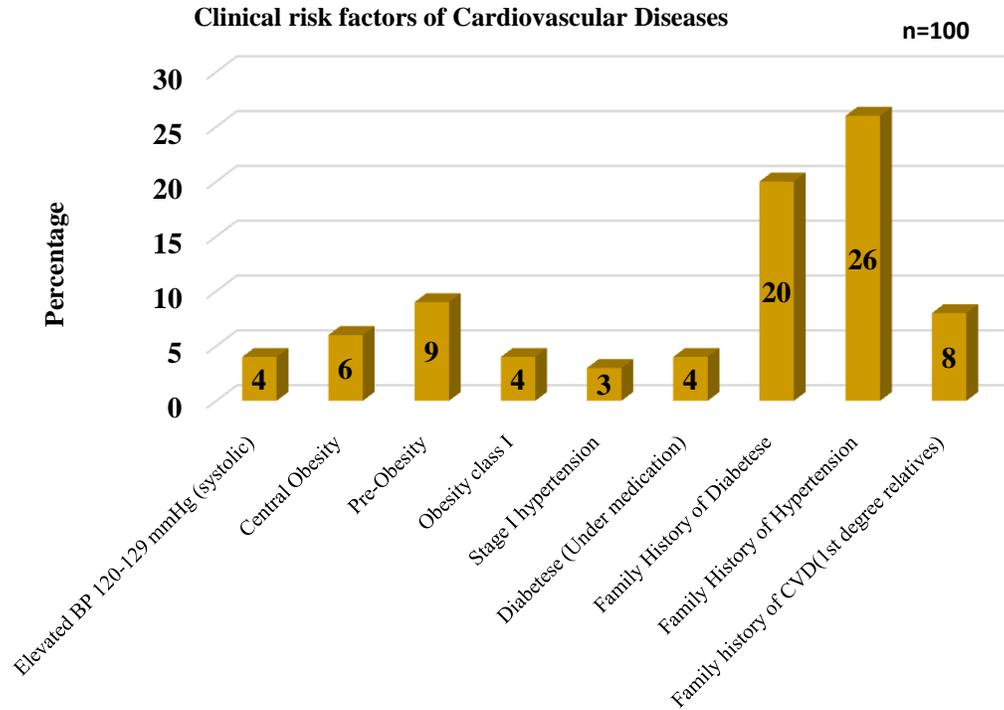
Sl. No.	Demographic Variables	Frequency	Percentage
1.	**Age**		
	18 – 20	32	32.0
	21 – 23	46	46.0
	>23	22	22.0
2.	**Gender**		
	Male	50	50.0
	Female	50	50.0
3.	**Marital status**		
	Married	12	12.0
	Unmarried	88	88.0
4.	**Type of family**		
	Nuclear	73	73.0
	Joint	27	27.0
5.	**Religion**		
	Hindu	37	37.0
	Meitei	52	52.0
	Muslim	5	5.0
	Christian	6	6.0
6.	**Region**		
	Imphal East	57	57.0
	Imphal West	19	19.0
	Northern sides from Imphal (Senapati, Ukhrul, Kangpokpi)	12	12.0
	Southern (Bishnupur, Kakching, Chandel)	12	12.0
7.	**Course of studying.**		
	Bachelor of Science	42	42.0
	Bachelor of Arts	49	49.0
	Bachelor of Commerce	9	9.0
8.	**Year of studying**		
	1st year	27	27.0
	2nd year	20	20.0
	3rd year	53	53.0
9.	**Socio – economic status**		
	Upper class (>Rs.7533)	9	9.0
	Upper Middle Class (Rs.3766 – 7532)	14	14.0
	Middle class (2260 – 3765)	55	55.0
	Lower Middle class (Rs.1130 – 2259)	20	20.0
	Lower class (<Rs.1129)	2	2.0
10.	**Occupation of parents**		
	Govt. job/Central job	28	28.0
	Pvt. Job/Business	30	30.0
	Farmer	42	42.0

Table 1 B: Frequency and percentage distribution of diseases related information of the college going students. **n=100**

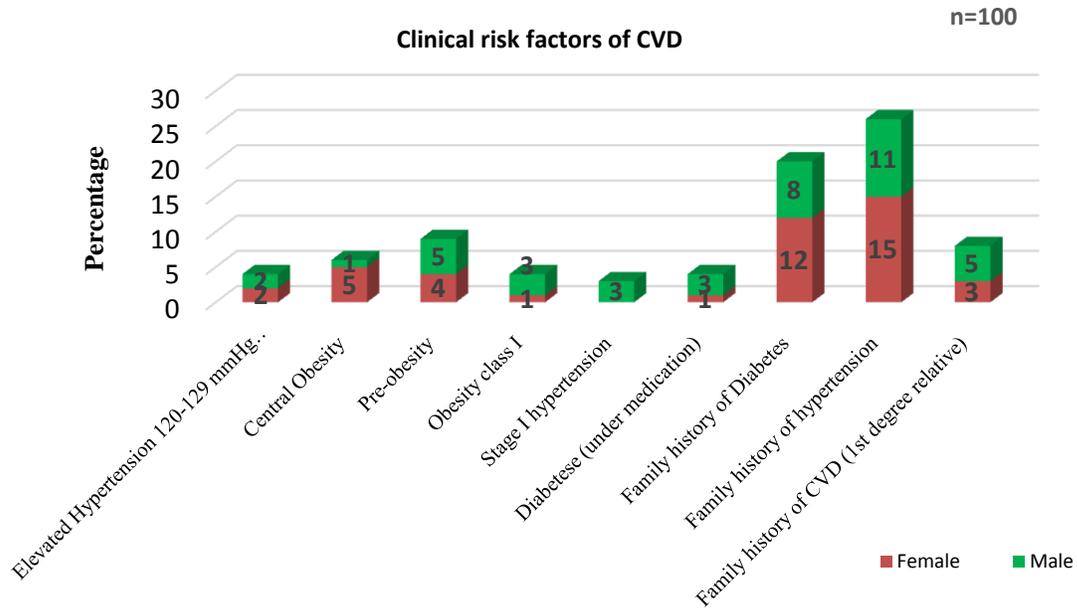| Sl. No.	Variables	Frequency	Percentage
11.	**Know about cardiovascular/heart diseases**		
	Yes	58	58.0
	No	42	42.0
12.	**Source of information**		
	Family members	7	7.0
	Friends	12	12.0
	Radio / Television	22	22.0
	Magazine / Journal	14	14.0
	Newspaper	3	3.0
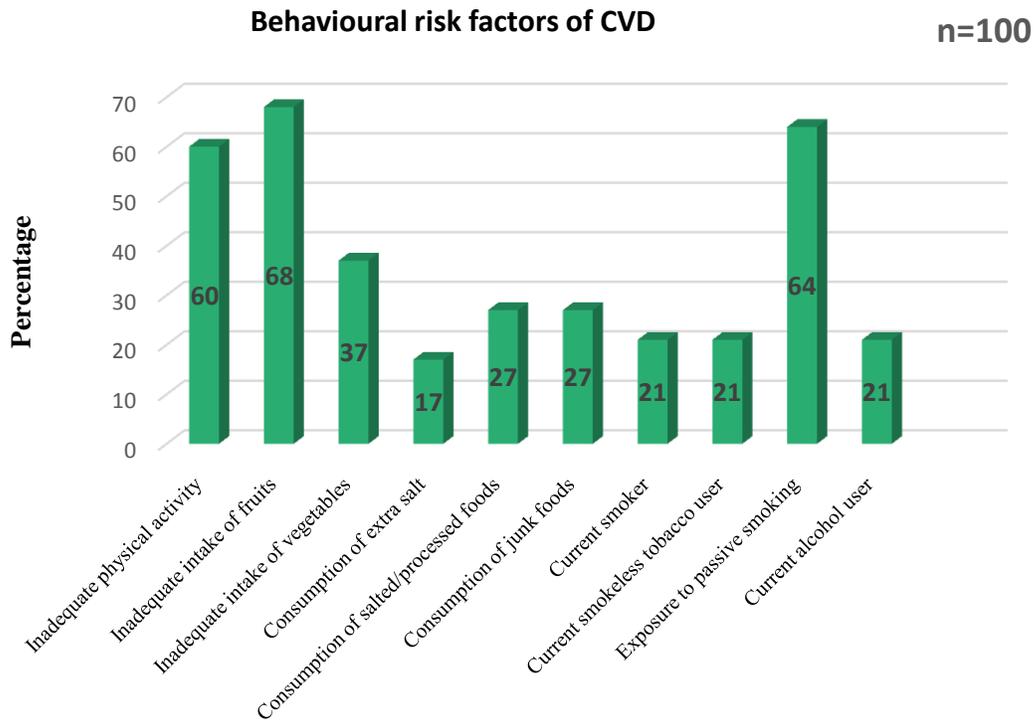
Fig.4: Bar diagram showing the percentage distribution of behavioral risk factors of Cardiovascular diseases among college going students.
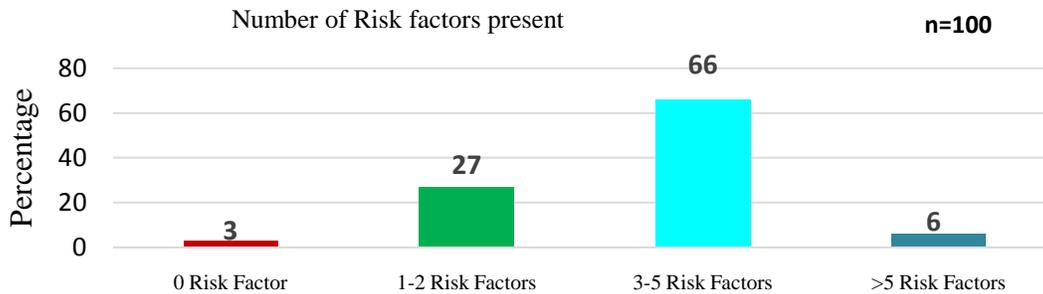
Clinical risk factors of Cardiovascular Diseases

n=100

Fig 2: Bar diagram showing the percentage distribution of clinical risk factors of cardiovascular diseases among college going students.
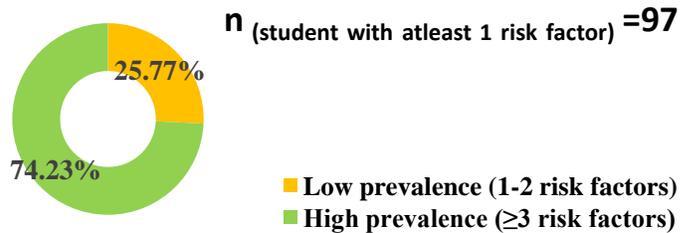
Behavioural risk factors of CVD

n=100

Fig 3: Component-bar diagram showing the percentage distribution of behavioral risk factors of cardiovascular diseases among female and male college students.

Clinical risk factors of CVD

n=100

Percentage

Elevated Hypertension 120-129 mmHg... 2 / 2
Central Obesity 5 / 1
Pre-obesity 4 / 5
Obesity class I 1 / 2
Stage I hypertension 3
Diabetese (under medication) 1 / 3
Family history of Diabetes 12 / 8
Family history of hypertension 15 / 11
Family history of CVD (1st degree relative) 3 / 5

■ Female ■ Male

Fig 4: Component-bar diagram showing the percentage distribution of clinical risk factors of cardiovascular diseases among female and male college students.

Number of Risk factors present

n=100
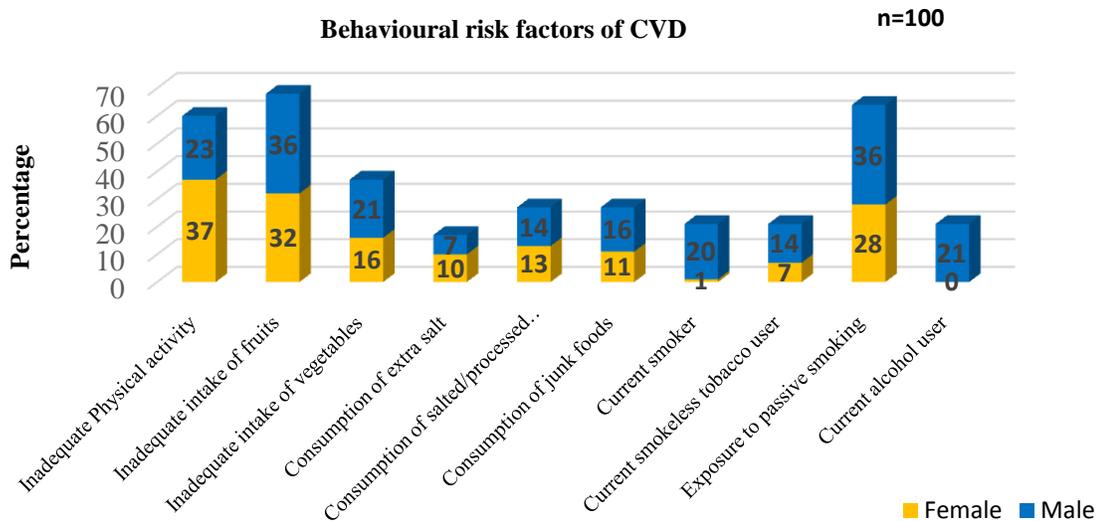
Percentage

0 Risk Factor 3
1-2 Risk Factors 27
3-5 Risk Factors 66
>5 Risk Factors 6

Fig 5: Bar diagram showing distribution of risk factors of cardiovascular diseases among college going students.

n (student with atleast 1 risk factor) =97

25.77%

74.23%

■ Low prevalence (1-2 risk factors)
■ High prevalence (≥3 risk factors)

Fig.6: Doughnut diagram showing the level of prevalence of risk factors of cardiovascular diseases among college going students.

n=100
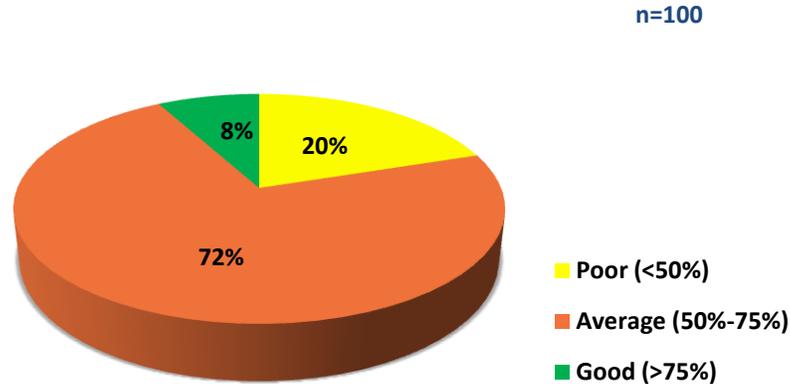
Fig.7: Pie diagram showing the level of awareness regarding risk factors of cardiovascular disease among college going students.

Table 2: Domain-wise range of score, mean score, mean percentage score and rank on level of awareness regarding risk factors of cardiovascular diseases among college going students.

n=100

Domain Name	Range of score	Mean score	Mean Percentage score	Rank
Modifiable Risk factors				
Inadequate physical activity	2-5	4.06	81.2	1st
Inadequate dietary pattern	1-7	4.01	71.57	2nd
Drawbacks of smoking	1-3	2.03	67.66	3rd
Consequences of alcohol use	0-1	0.52	52	6th
Effects of obesity	0-2	0.95	47.5	7th
Hypertension and its outcome	0-3	1.25	41.66	8th
Diabetes	0-2	0.69	34.5	10th
Non-modifiable Risk factors				
Age	0-2	1.32	66	4th
Family history	0-2	0.7	35	9th
Gender	0-1	0.29	29	11th
Adoption of self-care preventive measures.	0-2	1.2	60	5th

Table 3A: Association between level of awareness regarding risk factors of cardiovascular diseases with selected demographic characteristics.   n =100

Sl. No.	Socio-demographic Variable	Level of awareness		Chi-square value (χ^2)	df	P-value
		At and below median (≤18)	Above median (>18)			
1.	Age					
	• 18-20	15	17			
	• 21-23	25	21	1.467	2	0.496
	• >23	14	18			
2.	Gender					
	• Male	24	26	1.449	1	0.229
	• Female	30	20			
3.	Marital status					
	• Married	8	4	0.881	1	0.348
	• Unmarried	46	42			
4.	Types of family					
	• Nuclear	39	34	0.036	1	0.849
	• Joint	15	12			
5.	Religion					
	• Hindu	17	20			
	• Meitei	31	21	1.628	2	0.443
	• Muslim and Christian	6	5			
6.	Region					
	• Imphal east	28	29			
	• Imphal west	10	9	2.111	2	0.348
	• Northern and southern sides	16	8			
7.	Course of study					
	• B. Sc	20	22	1.187	1	0.275
	• B. A and B. Com.	34	24			
8.	Year of study					
	• 1st year	15	12			
	• 2nd year	12	8	0.533	2	0.525
	• 3rd year	27	26			
9.	Socio-economic status					
	• Upper and upper middle class	10	13			
	• Middle class	30	25	1.854	2	0.396
	• Lower middle and lower class	14	8			
10.	Occupation of parents					
		11				