

Original Research Article

## **Risk of Coronary Artery Disease among Nurses Working at BPKIHS Nepal**

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### **ABSTRACT**

**Introduction:** Coronary artery disease is the most prevalent yet one of the most preventable causes of death. It is the leading cause of death and disability. The study aimed at finding out the level of risk for coronary artery diseases among employees working at BPKIHS and also to find out the association between the levels of risk of coronary artery disease with selected demographic variables.

**Methods:** Cross sectional descriptive study was used. Verbal consent was obtained from all participants. Total 40 nurses working at BPKIHS were enrolled in the study by using non probability convenience sampling. Data were analysed by using descriptive statistics (frequency, mean and SD) and inferential statistics (chi square) to find out the association between the level of risk and selected demographic variables.

**Results:** Study result shows that majority of respondents (87 %) were married, 90 % of them were Hindu, and 50 % of respondents had an education of graduate level in nursing, Regarding overall risk of respondents, 87.5 % of respondents were found to be at lower risk of coronary artery disease, 12.5 % of them were found to be at moderate risk and none of them were found to be at higher risk of coronary artery disease. There is no association between the level of risk among respondents with sex, marital status, religion, education and family history of coronary artery disease ( $p>0.05$ ).

**Conclusion:** It can be concluded that educational programme regarding the early detection and prevention of coronary artery disease should be carried out periodically for individual prior to the clinical evidence of it with the goal of preventing its occurrence.

**Key Words:** Coronary artery disease, Nurse, BPKIHS, Nepal.

### **INTRODUCTION**

Coronary artery disease (CAD) is a leading cause of morbidity and mortality worldwide and was responsible for 7.2 million deaths in 2003. Various studies have pointed out that South Asians have a higher prevalence of CAD as compared with other ethnicities. South Asians have a genetic predisposition to CAD; however, environmental, nutritional and life style factors may also be the responsible. South Asian have a much higher prevalence of

metabolic syndrome, diabetes, insulin resistance, central obesity, dyslipidemia, increased thrombotic tendency (increased plasminogen activator inhibitor-1 and decreased tissue plasminogen activator levels), decreased level of physical activity. In addition the dietary indiscretions and sedentary life style practiced by most South Asians puts them at a higher risk for CAD. A multidisciplinary approach involving the population at risk, health care personnel, and the government is required to diminish

the incidence. Educational programmes regarding the genetic predisposition as well as risk factors for CAD, physical activity and dietary modifications need to be encouraged. Mass media should be involved to bring about behavioral changes, and these changes should be reinforced at the physician's level. [1]

Although only 2 percent to 6 percent of MIs occur in young patients, this disorder represents a major cause of long-term disability in this group. In these patients, an increased number of conventional risk factors has been observed, with cigarette smoking being the most prevalent. Angiography in young patients with MI most often demonstrates single-vessel CAD and slow progression of atherosclerosis. When multivessel CAD is found, the long-term prognosis is less favorable. In women, CAD is more likely to present as angina than MI or sudden death. Cigarette smoking and oral contraceptive use are important risk factors. Although MIs in women occur less often than in men, women experience a less favorable acute and long-term prognosis. [2]

The relationship between dietary fats and CAD has been extensively studied, with strong and consistent associations emerging from a wide body of evidence occurred from animal experiments, as well as, observational studies, clinical trials and metabolic studies conducted in diverse human population. Saturated fatty acids raise total and low density lipoproteins while trans fatty acids (formed by partial hydrogenation, a process used to increase the shelf-life of polyunsaturated fatty acids or PUFAs) render the plasma lipids profile even more atherogenic than saturated fatty acids, by not only elevating LDL cholesterol but also by decreasing HDL cholesterol. Most transfatty acids are contributed by industrially hardened oils and deep fried fast foods and baked goods are a major and increasing source. Several large cohort studies have found that intake of transfatty acids increases the risk of CAD. [3]

Sixty to 85 % of the world population from both developed and

developing countries is not physically active enough to gain health benefits. Every year more than 2 million deaths are attributable to physical inactivity. Physical inactivity doubles the risk of developing heart disease and increases the risk of HTN by 30 %. It also doubles the risk of dying from CVD and Stroke. [4]

Coronary artery disease (CAD) is associated with the habits, and life styles of people, any attempt to establish a healthy life style in the population can bring about a reduction in the morbidity and mortality of coronary artery disease. The prevention of CAD involves preventions at three levels: Primary prevention involves developing awareness to the potentials areas of risk to the individuals well being and the specific measures taken prior to the clinical evidence of the disease or injury. Secondary prevention is directed towards disrupting the already established diseases process by mean of early diagnosis and prompt treatment with the goal of reversing or slowing the diseases process, thus reducing subsequent morbidity and mortality. Tertiary prevention includes rehabilitation of a patient who has suffered from the disease with the goal of restoring him to the optimal levels of physical-psychological, social, and vocational status so as to enable him to achieve a full, vital and productive life. [5]

Cardiovascular diseases (CVDs) have now been finally recognized as a major public health issue in Nepal. This small landlocked South Asian country has an abundance of harmful risk factors that lead to CVD and the country lacks a system to maintain cardiovascular health. Recent national and international attention on CVDs led to the formulation of a non-communicable diseases policy draft, which is yet to be endorsed by the government. This paper describes the present situation of CVDs in Nepal, with a focus on coronary heart disease and its risk factors (epidemiology), ongoing global and national strategies pertaining to the country (strategies), and the work that needs

attention to implement the strategies (implementation). [6]

**MATERIALS AND METHODS**

- **Design of the Study:** Cross sectional descriptive study was adopted to assess the level of risk for coronary artery diseases.
- **Population:** All nurses working at BPKIHS.
- **Setting:** BPKIHS, a tertiary level medical university in Nepal
- **Sample size:** Forty nurses were enrolled in the study
- **Sampling technique:** Non probability purposive sampling technique was used to recruit the sample.
- **Research Instruments:** The standard tool developed by Sr. Nancy for the assessment of Coronary Risk-Status of normal adult was adopted for the study. Research tool consists of variables measuring the risk status of respondents. Each Statement carries some score. Total score was calculated and according to the score the respondents made, the respondents were categorized as Low risk, Moderate risk, and High risks for CAD (coronary artery disease).
- **Data collection Procedure:** Verbal consent was taken from all subjects who participated in the study. The researcher himself collected data.
- **Data analysis Procedure:** Data were be analyzed by using descriptive i.e. Frequency, percentage, and standard deviation and Risk status was described as Low, moderate and high risk for CAD as following

Score: 7-25 is considered as Low risk

Score: 26-45 is considered as moderate risk

Score: 46- 90 is considered as High risk

**RESULTS AND DISCUSSION**

This study aimed at finding out the level of risk of risk of CAD among nurses working in BPKIHS and also to find out the association between the level of risk and selected demographic variables. A number of risk factors have been identified in CAD,

of the factors analysed in this study were age of respondents, sex, family history, hereditary factors, physical activity and occupation, dietary habits, habits of smoking, comorbidities, personality types, stress manifestations etc.

Regarding the demographic profiles of respondents, the current study shows that majority of respondents were married (87 %) followed by unmarried (7%), widower (3%) and separated (3%). Most of respondents were Hindu (90 %), followed by Buddhist (8 %) and Muslim (2 %), 50 % of respondents had an education of graduate level in nursing followed by post graduate level (35%) and certificate level in nursing (15%). Approximately 46 % of respondents had family income of Rs. 5000.00-Rs.10000.00 (NPR) per month followed by 50 % having family income of Rs. 10000-Rs.15000.00 NPR and only 2% of respondents had family income of Rs. 15000 NPR and above.

About eighty three percentages of respondents had no family history of any kinds of cardiac diseases. (Table 1)

**Table1: Demographic profile of Respondents (n=40)**

Variables	Frequency	Percentage
<b>Sex</b>		
Male	9	22.5
Female	31	77.5
<b>Marital Status</b>		
Married	35	87.0
Unmarried	3	7.5
Widower	1	2.5
Separated	1	2.5
<b>Education</b>		
CN	6	15.0
Graduate	20	50.0
Post graduate	14	35.0
<b>Religion</b>		
Hindu	34	85.0
Muslim	1	2.5
Buddhist	2	5.0
Others	3	7.5
<b>Family Income (per month)</b>		
Rs. 5000-Rs.10000.00. NPR	19	47.5
10000.00-Rs.15000.00 NPR	20	50.0
NPR Rs. 15000 and above	1	2.5
<b>Self or family suffering from diseases</b>		
Yes	7	17.5
No	33	82.5

Regarding the age related risk factors of respondents about coronary artery diseases, The current study shows that 50 % of respondents were from the age group 30-

40 years, 42.5 % between the age group 40-50 years and only 7.5 % between the age group 50- 60 years. (Table 2)

**Table2: Age Related Risk factors of Respondents about Coronary Artery Diseases (n=40)**

Age	Frequency	Percentage
My age is less than 20 years	-	-
My age is above 20 years but less than 30 years	-	-
My age is above 30 years but less than 40 years	17	42.5
My age is above 40 years but less than 50 years	20	50.0
My age is above 50 years but less than 60 years	3	7.5

**Table 3: Sex Related Risk factors of Respondents about Coronary Artery Diseases (n=40)**

Sex	Frequency	Percentage
I am female below 40 years old	12	30.0
I am female above 40, but less than 50 years	15	37.5
I am female who has reached the menopause	3	7.5
I am male below 40 years old	7	17.5
I am male above 40 but less than 60 years old	3	7.5

Regarding sex related risk factors, the current study shows that 37.5 % of respondents were female above the age of 40 years but less than 50 years, 30 % of them were female below 40 years of age, and 7.5 % of them had reached the menopause. Similarly 25 % of them were male, among them 17.5 % were below the age of 40 years and 7.5 % were between the age of 40-60 years of age (Table 3). Similar study conducted by Pekka Jousilahti, MD; Erkki Vartiainen, MD; Jaakko Tuomilehto, MD; Pekka Puska, MD in Finland shows

that relative difference in coronary heart disease (CHD) risk between sexes was largest among the youngest subjects, 25 to 49 years old, and smallest among the oldest subjects, 60 to 64 years old. The absolute difference in CAD risk, however, was largest in the oldest age group.

Regarding the hereditary related risk factors of coronary artery diseases of respondents, 70 % respondents did not have family history of CAD, 12.5 % of them had given the history of one close relative who developed heart disease before 60 years of age, and 7.5 % of them said that they had one close relative who developed heart disease after 60 years of age and 5% of respondents had history of CAD on two close relative who developed heart disease after 60 years of age and Three close relative who developed heart disease before 60 years of age (Table 4). Similar study conducted by Ciruzzi M. et al, on frequency of family history in patients with acute MI the result shows that the incidence of MI among cases with a twofold higher incidence of the family history was 31% Vs 15% for controls. After risk factor adjustments, the overall OR was 2.18 (at least one relative, 2.04; two relatives, 3.18). Family history had even stronger contribution when in combination with other risk factors e.g. plus cholesterol 240 mg (OR=4.5), plus hypertension (OR= 4.5), plus current smoking (OR=5.17).<sup>[7]</sup>

**Table 4: Heredity Related Risk factors of Respondents about Coronary Artery Diseases (n=40)**

Heredity	Frequency	Percentage
I do not have any close relative who developed coronary artery diseases	28	70.0
I have one close relative who developed heart disease after 60 years of age	3	7.5
I have two close relative who developed heart disease after 60 years of age	2	5.0
I have one close relative who developed heart disease before 60 years of age	5	12.5
I have Two close relative who developed heart disease before 60 years of age	2	5.0
I have Three close relative who developed heart disease before 60 years of age	-	-

Regarding physical activity of respondents, 47.5 % of respondents had involved in an active occupation but did not involve in regular exercises, 30 % of them said that they involved in active occupation and on regular exercises, 15 % of them said

that they are involved in moderately active occupation and do regular exercises, 5.0 % of them had a sedentary occupation, but not doing regular exercises and 2.5 % of them have a sedentary occupation, but I do regular occasionally (Table 5).

**Table 5: Physical activity of Respondents(n=40)**

Heredity	Frequency	Percentage
I have active occupation and I do regular exercises	12	30.0
I have a moderately active occupation and I do regular exercises	6	15.0
I have an active occupation and I do not do regular exercises	19	47.5
I have a sedentary occupation, but I do regular exercises	-	-
I have a sedentary occupation, but I do regular occasionally	1	2.5
I have a sedentary occupation, but I do not do regular exercises	2	5.0

**Table 6: Respondents according to Habit of Tobacco Smoking (n=40)**

Heredity	Frequency	Percentage
I have never smoked cigarettes/pipe/beedis	35	87.5
I used to smoke, but now stopped smoking	4	10.0
I smoke less than 10 cigarettes daily	1	2.5
I smoke 10 cigarettes or above, but less than 20 cigarettes per day	-	-
I smoke 20 cigarettes or above, but less than 30 cigarettes per day	-	-
I smoke 30 cigarettes or above per day	-	-

Result related to habit of tobacco smoking of respondents, majority of respondents (87.5%) said that they have never smoked cigarettes/pipe/beedis in life, 10 % of them had the history of smoking in the past but now stopped smoking and only 2.5 % of them had history of smoking and said that they are smoking less than 10 cigarettes daily. None of the respondents had history of smoking more than 10 cigarettes per day. (Table 6). A retrospective study conducted by V Achari, AK Thakur on " Association of Major Modifiable Risk Factors Among Patients with Coronary Artery Disease – A Retrospective Analysis" in Heart Hospital, Kankarbagh, Patna in which the prevalence of smoking was 1780 (30.97%) in the patients group as compared to 1031 (12.72%) in non-CAD group, this was strongly significant ( $p < 0.0001$ ). [8]

Similarly regarding dietary habits of respondents, 12.5 % of respondents were vegetarian and 87.5 % were non-vegetarian. Among those who were vegetarian 7.5% of them said that they eat foods cooked in oil but do not eat fried foods, eggs, cream of milk, cheese etc, 5% of them said that they eat foods cooked in oil, fried foods, eggs, cream of milk, cheese etc. Similarly among those who were non vegetarian, 52.5% of them said that they eat foods cooked in oil fried foods, cream of milk, butter, ghee, cheese, eggs etc. About 25% of respondents had history of high blood pressure, 13.6% had DM, 12.5% had the habit of taking extra salts in diet, 25% had the habit of taking alcohol, 87.5% had the habit of taking sugar, sweets, cakes, ice creams etc. (Table 8)

**Table 7: Respondents according to their Dietary Habits (n=40)**

Dietary Habits	Frequency	Percentage
<b>Only for Vegetarian</b>		
I am a strict vegetarian, and I do not eat foods cooked in oil, fried foods, cream of milk, butter/ghee, cheese etc.	1	2.5
I am vegetarian and I eat foods cooked in oil but do not eat fried foods, eggs, cream of milk, cheese etc.	3	7.5
I am vegetarian and I eat foods cooked in oil , fried foods, eggs, cream of milk, cheese etc.	1	2.5
<b>Only for Non vegetarian</b>		
I am a non vegetarian and I eat foods cooked in oil ,but do not eat fried foods, cream of milk, butter, ghee, cheese, eggs etc.	14	35.0
I am a non vegetarian and I eat foods cooked in oil fried foods, cream of milk, butter, ghee, cheese, eggs etc	21	52.5

Regarding the other risk factors of CAD, the current study shows that 25 % of respondents had history of high blood pressure, 13.6 % had DM, 12.5 % had the habit of taking extra salts in diet, 25% had the habit of taking alcohol, 87.5 % had the habit of taking sugar, sweets, cakes, ice

creams etc,(Table 8) High blood pressure is estimated to cause 7.1 million deaths, about 13 5 of the total global fatality. Across WHO region, research indicates that about 62 5 of strokes and 49 5 of heart attacks are caused by increased Blood pressure. It causes 5 million of premature deaths a year

worldwide. It is also ranked third as a cause of disability adjusted life years. The WHO estimates that 600 million people with high

BP are at risk of heart attacks, strokes and cardiac failure. [9]

**Table 8: Other Risk Factors of Coronary Artery Diseases (n=40)**

Risk Factors	Frequency	Percentage
I do not have high blood pressure	30	75.0
I have high blood pressure	10	25.0
I am not a diabetic patient	34	77.3
I am a diabetic patient	6	13.6
I do not use extra salt in my diet	35	87.5
I use extra salt in my diet	5	12.5
I do not take alcohol drinks	30	75.0
I often take alcohol drinks	10	25.0
I do not use sugar	5	12.5
I eat sugar, sweets, cakes, ice creams etc,	35	87.5
I do not take pills for birth control( For female only)	40	100

**Table 9: Respondents According to Stress Manifestation (n=40)**

Stress Manifestation	Agree		Disagree	
	Frequency	Percentage	Frequency	Percentage
I am easily exited.	18	46.2	22	
I am impatient.	11	27.5	29	72.5
I am always energetic and at a high degree of readiness for physical action	25	52.5	15	37.5
I always enjoy taking risks	18	46.2	22	
I am highly emotional	17	42.5	23	57.5
I am unable to relax	6	15.0	34	85.0
I always strives for social approval	19	47.5	21	52.5
I am always tense	2	5.0	38	95.0
I am bound by habits	10	25.0	30	75.0
I find it difficult to fall asleep	8	20.0	32	80.0
I have frequent stomach trouble eg. Diarrhea, indigestion	4	10.0	36	90.0
I can not keep my mind on one thing	12	30.0	28	70.0
I do not find time to reply letters.	7	17.5	33	82.5
I frequently find myself worrying about something.	12	30.0	28	70.0
It takes a long time for me to take a decision.	13	32.5	27	67.5
I seldom find time to relax, or stretch during the day.	19	47.5	21	52.5
It makes me nervous to have to wait.	12	30.0	28	70.0
I am quite restless if I have to sit wait.	13	32.5	27	67.5
I am unable to joke.	13	32.5	27	67.5
I wish I could be as happy as others seem to be.	35	87.5	5	12.5

**Table 10: Personality Type of Respondents (n=40)**

Personality type	Agree		Disagree	
	Frequency	Percentage	Frequency	Percentage
I always have a tendency to challenge others	22	55.0	18	45.0
I am always ambitious and achievement oriented	29	72.5	21	27.5
I am unable to relax without feeling guilty	11	27.5	29	72.5
I become very impatient when I am struck in a slow traffic or get caught in a slow moving line	17	42.5	23	57.5
I am greatly concerned with meeting deadlines and I am impatient.	23	57.5	17	42.5
I feel urgency about doing things quickly and immediately.	19	72.5	11	27.5
I always try to do more than one thing simultaneously.	21	52.5	19	47.5
I eat, move and walk rapidly.	26	65.0	14	35.0
I tend to take up more and more responsibilities in less and less time.	15	37.5	25	62.5
I feel impatient and I exhibit my impatience when I feel events are taking place very slowly.	14	35.0	26	65.0
I tend to rate myself in terms of the number of things that I have accomplished.	24	60.0	16	40.0
I often interrupt other people to finish sentences for them, thus unconsciously urging them to hasten the rate of speaking.	8	20.0	32	80.0
I am so involved in my work I rarely take notice of my surroundings.	13	32.5	27	67.5
During my conversations, I have nervous gestures like grinding my teeth, clenching the fist, and banging hands on the table etc.	3	7.5	37	92.5

**Table 11: Level of Risk of CAD among Respondents (n=40)**

Level of Risk	Frequency	Percent
Low Rsk	35	87.5
Moderate Risk	5	12.5
High Risk	-	-

Regarding stress related risk factors, various stress manifestation of respondents were assessed. The current study shows that respondents had the feelings of being easily exited (46.5%), impatient (27.5%), highly

emotional (46.5%), unable to relax (15 %), always tenses (5%), difficult in sleeping (20 %), unable to keep mind in one thing (30%), not finding time to reply letters (17.5 %), finding themselves worrying about something (30%), taking long time to take decisions (32.5 %), not finding time to relax (47.5 %), feelings of nervous while waiting (30%), feeling of restless while sit await (32.5%), frequent stomach trouble e.g. Diarrhea, indigestion (10%) and unable to joke (32.5%). Similarly 52.5 % of respondents had reported the feeling of being energetic and at a high degree of readiness for physical action, 46 % of them reported that they enjoy taking risks, always

strives for social approval (47.5%), 87.5 % of them reported that they could be as happy as others seem to be. (Table 9) Similar study conducted by Everson SA, Goldberg DE, Kaplan GA, et al shows that psychological distress, particularly depressive disorders, has long been identified as significant and consistent predictors of CHD. It is associated with up to three fold increased risk of CHD in men. Hopelessness, which correlates moderately with depression, was associated with an increased CHD risk in a dose dependent way even after adjustment for socio-demographic and CHD risk factors in NHANES study. [10]

**Table 12: Difference in mean level of risk among Respondents according to their education**

Level of Education	n	Mean	Std. Deviation	F	Sig.
Certificate Level in Nursing	6	17.1667	6.61564	.072*	.931
Bachelor Level in Nursing	20	16.5000	5.20627		
Master Level in Nursing	14	17.1429	5.24562		

\* One-way ANOVA

Respondents reported that they always had a tendency to challenge others (55%), ambitious and achievement oriented (72.5 %), try to do more than one thing simultaneously (52.5%), eat, move and walk rapidly (65%), take up more and more responsibilities in less and less time(37.5%), tend to rate themselves in terms of the number of things that they had accomplished. (60%) But 72.5 % of respondents reported that they feel urgency about doing things quickly and immediately, 57.5 % of respondents reported that they are greatly concerned with meeting deadlines and become impatient, 42.5 % of them said that they became become very impatient when they struck in a slow traffic or get caught in a slow moving line, 35 % of them reported that they feel impatient and exhibit impatience when events are taking place very slowly, 20% of them that they often interrupt other people to finish sentences for them, thus unconsciously urging them to hasten the rate of speaking. Similarly 7.5 % of respondents reported that during their conversations, they had nervous gestures like grinding teeth, clenching the fist, and banging hands on the table etc. (Table 10)

Regarding overall risk of respondents, 85 % of respondents were found to be at lower risk of CAD followed by 12.5 % at moderate risk and need to change their life styles and none of them were found to be at high risk of coronary artery disease. (Table 11)

**Table 13: Association between Risk factors of coronary artery diseases and demographic variables**

Variables	Level of Risk			P value
	Low Risk	Moderate Risk	High Risk	
<b>Sex</b>				0.668*
Male	7	2	-	
Female	28	3	-	
<b>Marital Status</b>				0.698**
married	30	5	-	
unmarried	3	0	-	
widower	1	0	-	
separated	1	0	-	
<b>Education</b>				0.883**
CN	5	1	-	
Graduate	18	2	-	
Post graduate	12	2	-	
<b>Religion</b>				0.627
Hindu	29	5	-	
Muslim	1	0	-	
Buddhist	2	0	-	
others	3	0	-	
<b>Family history of CAD</b>				1.000
Yes	6	1	-	
No	29	4	-	

Continuity correction

\*\* Likelihood ratio

Difference in mean level of risk among respondents according to their level of education was not significant. ( $p=0.09$ ) (Table 12). There is no association between the level of risk of CAD with any sociodemographic variables ( $P > 0.05$ ) (Table 13)

## CONCLUSION

It can be concluded that all nurses required providing a better picture of the risk factor profile for CAD. In the mean time, emphasis should be given on diagnosis and control of dyslipidemia, type 2 diabetes, hypertension and cessation of smoking which have been identified in this large study as major risk factors for coronary artery disease. Hence it is concluded that educational programme regarding the early detection and prevention of CAD should be carried out periodically for individual prior to the clinical evidence of CAD with the goal of preventing its occurrence.

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