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Assessment of risk of cardiovascular diseases among adult population

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Abstract

Introduction: India with the world's second largest population and economic growth contributes to high global burden of disease. Deaths and disability due to CVDs is expected to double by 2015 and worsen by 2020.

Objectives: The current study aimed to assess the risk of cardiovascular diseases among adult population; to determine association between risks of cardiovascular diseases with selected variables.

Methods: A quantitative research approach using pre-experimental (one group pre test post test design) was adopted for the study. Survey of 350 adult population of Simbla village (201 females and 149 males) was done using purposive sampling technique. CVD risk assessment questionnaire and WHO CVD risk assessment tool were used to collect the data.

Results: Majority 156(44.57%) of adult population were below 30 years of age and 201(57.43%) were females. Overall mean score of CVD risk was (75.39±72.06). In terms of stress, mean score was (25.65±30.30) which was higher as compared to other areas of CVD risk. Out of 350 adult population, 30 (8.57%) of adults had pain or discomfort or pressure or heaviness in chest and 17(4.86%) had difficulty in talking, weakness of arm or leg on one side of the body or numbness on one side of the body.

Conclusions: In overall CVD risk score majority of the adult population under 30 years of age were found at low risk of developing CVDs. Cardiovascular risk has significant association with age, gender, educational status, heard of CVD, history of heart attack, family history, alcohol, BMI, SBP, blood sugar at the level of ($p \leq 0.05$).

Keywords: Cardiovascular diseases, adult population, CVD risk assessment.

1. Introduction

Cardiovascular disease (CVD) burden of India is expected to double in the next two decades, making it the single largest cause of death and the second largest cause of disability by the year 2020. The lifetime risk of CVD is substantial and the condition is often silent or may strike without warning, underscoring the importance of prevention [1].

In developing countries, along with the existing modifiable risk factors, low vegetable and fruit intake and alcohol abuse ranks first in the list of risk factors [2]. It is also widely accepted that age, sex, high blood pressure, smoking, dyslipidemia and diabetes are the major risk factors for developing cardiovascular disease [1] India with the world's second largest population and economic growth contributes to high global burden of disease. Deaths and disability due to CVD is expected to double by 2015 and worsen by 2020 [3].

Most studies have used an age cut-off of 40-45 years to define "young" patients with coronary heart disease or acute myocardial infarction. The most behavioral risk factor of CVDs is unhealthy diet, physical inactivity and tobacco use, which are responsible for 80% of strokes and coronary heart disease. Unhealthy diet leads to hypertension, diabetes, overweight and obesity [2]. Twenty-five per cent of heart attack deaths occur in people less than 40. Every day nine hundred people under 30 die due to heart disease [4].

Trends show that risk factors causing CVD's has been steadily increasing, it has also been spreading from urban to rural population. Due to weak health system, undiagnosed, untreated and uncontrolled CVD in adult rural population, numbers of CVD risk factors people are increased [5].

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2. Aims and Objectives

- To assess the risk of cardiovascular diseases among adult population
- To determine association between risks of cardiovascular diseases with selected variables.

3. Methodology

A quantitative research approach using pre-experimental (one group pre test post test design) was adopted for the study. Survey of 350 adult population (aged 20-45 years) of Simbla village (201 females and 149 males) was done using purposive sampling technique. Antenatal mothers were excluded from the study. The data was collected using CVD risk assessment questionnaire and WHO CVD risk assessment tool in the month of November 2015 to January 2016. Ten to fifteen subjects were interviewed per day. On an average it took 30 to 40 minutes to collect the data from each subject. Based on method of scoring, the score obtained was categorized into three categories i.e., Low risk (-73-101), Moderate risk (102-264) and High risk (265 and above).

Demographic variable consisted of 18 items such as age, gender, educational status, marital status, religion, type of occupation, total monthly income, type of family, dietary habits, heard of CVDs, source of information, history of heart attack, family history, BMI, waist circumference, CVD risk assessment questionnaire included factors such as lifestyle (exercise, smoking, passive smoking and alcohol), stress, sleep, bowel toxicity, blood sugar, inflammation and pain, diet and SBP. WHO CVD risk assessment tool comprised of 8 items. Item no. 1 to 7 assessed angina or heart attack while item no. 8 assessed stroke and TIA. Formal administrative approval was obtained from the ethical committee of MMIMSR, Mullana, Ambala, B.D.O of Simbla village to conduct the final study. Informed written consent was taken from the participants.

4. Results

Table 4.1 data reveals frequency and percentage distribution of 350 adult population who were surveyed for risk of CVD. Majority 156(44.57%) of adult population were below 30 years of age and 201(57.43%) were females. Majority 249 (71.14%) were vegetarian, only 7(2%) had history of heart attack and 87 (24.86%) had family history of heart problems. Mostly 132(37.71%) of adult population had stress related to family, 193 (55.14%) had BMI within normal range (18.5-24.9), 127(36.29%) had SBP between 120-129 mm/Hg, 41 (11.71%) were smoker and 60 (17.14%) were alcoholic.

Table 4.1: Frequency and percentage distribution of selected variables N=350

S. No.	Demographic variables	f	(%)
1.	**Age in years**		
1.1	Under 30	156	44.57
1.2	30-34	64	18.29
1.3	35-39	50	14.28
1.4	40-44	52	14.86
1.5	45	28	08.00
2.	**Gender**		
2.1	Female	201	57.43
2.2	Male	149	42.57
3.	**Educational status**		
3.1	No formal education	32	09.14
3.2	Primary	64	18.29
3.3	Up to secondary	97	27.71
3.4	Up to higher secondary	106	30.29
3.5	Graduate and above	51	14.57
4.	**Marital Status**		
4.1	Married	302	86.29
4.2	Single	48	13.71
5.	**Religion**		
5.1	Hindu	348	99.43
5.2	Muslim	02	00.57
6.	**Type of Occupation**		
6.1	Homemaker	167	47.71
6.2	Employed	58	16.57
6.3	Laborer	85	24.29
6.4	Business	18	05.14
6.5	Unemployed	22	06.29
7.	**Total monthly income of the family (in Rs.)**		
7.1	<5000	46	13.14
7.2	5001-10000	201	57.43
7.3	10001-15000	44	12.57
7.4	>15000	59	16.86
8.	**Type of family**		
8.1	Joint	201	57.43
8.2	Nuclear	128	36.57
8.3	Extended	21	06.00
9.	**Dietary Habits**		
9.1	Vegetarian	249	71.14
9.2	Non-vegetarian	83	23.71
9.3	Egg eater	18	05.15
10.	**Heard of cardiovascular disease**		
10.1	Yes	297	84.86
10.2	No	53	15.14
11.	**Source of information regarding cardiovascular disease**		
11.1	Television/ Radio	79	26.60
11.2	Newspaper/Magazine	25	08.42
11.3	Family and friends	175	58.92
11.4	Health awareness program	18	06.06
12.	**History of heart attack**		
12.1	Yes	07	02
12.2	No	343	98
13.	**Family history of heart problem**		
13.1	Yes	87	24.86
13.2	No	263	75.14
14.	**Stress related to**		
14.1	Finance	11	03.14
14.2	Family	132	37.71
14.3	Occupation	35	10.00
14.5	education	07	02.00
14.6	any other, specify_____	08	02.29
14.7	No stress	157	44.86
15.	**Smoking**		
15.1	Yes	41	11.71
15.2	No	309	88.29
16.	**Alcohol**		
16.1	Yes	60	17.14
16.2	No	290	82.86
S. No.	**Health related data**	**f**	**(%)**
17.	**BMI(kg/m²)**		
17.1	<18.5	57	16.29
17.2	18.5-24.9	193	55.14
17.3	25-29.9	68	19.43
17.4	>30	32	09.14
18.	**Systolic Blood Pressure (mm/Hg)**		
18.1	Less than 120	99	28.29
18.2	120-129	127	36.29
18.3	130-139	72	20.57
18.4	140-149	52	14.85
19.	**Blood sugar (>120 mg/dL)**		
19.1	Yes	11	03.14
19.2	No	339	96.86
20.	**Waist circumference (f=<35 inch, M=<45 inch)**		
20.1	Yes	261	74.57
20.2	No	89	25.43

Data presented in Table 4.2 reveals that majority 257 (73.43%) of adult population were found to be at low risk while 81(23.14%) and 12(3.43%) were at moderate and high risk respectively.

Table 4.2: Overall frequency and percentage distribution of levels of cardiovascular risk of adult population N=350

Levels of cardiovascular risk	Score	f	(%)
Low risk	-73-101	257	73.43
Moderate risk	102-264	81	23.14
High risk	≥265	12	03.43

Minimum score: -73
Maximum score: ≥265

Data presented in Table 4.3 shows that overall CVD risk score was more in females 148(42.29%) as compared to males 109(31.14%). This table also depicted that area wise CVD risk score in terms of lifestyle, sleep, bowel toxicity, blood sugar, inflammation and pain, diet and SBP was more in females than males while in stress males were at more risk than females.

Table 4.3: Gender wise and Area wise frequency and percentage distribution of level of CVD risk of adult population N=350

Area	Level	Female (n=201) f (%)	Male (n=149) f (%)
Cardiovascular History	High	05(1.43)	05 (01.43)
	Low	196(56.00)	144(41.14)
Lifestyle	High	30(8.57)	30(08.57)
	Moderate	80(22.86)	44(12.57)
	Low	91(26.00)	75(21.43)
Stress	High	74(21.14)	18(05.14)
	Moderate	41(11.71)	27(07.71)
	Low	86(24.57)	104(29.71)
Sleep	High	07(02.00)	06(01.71)
	Moderate	49(14.00)	25 (07.14)
	Low	145(41.43)	118(33.72)
Bowel Toxicity	High	12(03.42)	03 (00.86)
	Moderate	61(17.42)	25(07.14)
	Low	128(36.57)	121(34.57)
Blood Sugar	High	09(02.57)	02 (00.57)
	Low	192(54.86)	147(42.00)
Inflammation and pain	Moderate	38(10.86)	07 (02.00)
	Low	163(46.57)	142(40.57)
Diet	High	32(09.14)	21(06.00)
	Moderate	60(17.14)	49(14.00)
	Low	109(31.14)	79(22.57)
SBP	High	21(06.00)	19(05.43)
	Moderate	38(10.86)	38(10.86)
	Low	142(40.57)	92(26.28)
Overall CVD risk	High	08(02.29)	04(01.14)
	Moderate	45(12.86)	36(10.28)
	Low	148(42.29)	109(31.14)

Table 4.4 reveals that in the overall mean score of CVD risk of adult population was (75.39±72.06). Mean score of SBP (11.93±12.32) was higher than mean score of inflammation and pain (06.27±10.55). In terms of stress mean score was (25.65±30.30) which was higher as compared to other areas of CVD risk.

Table 4.4: Mean, Median, Standard Deviation of CVD risk score of adult population in terms of modification of lifestyle N=350

Area	Range maximum	Mean±SD	Median
Family history	0-45	05.74±11.18	1.00
Cardiovascular history	0-250	04.14±25.19	0.00
Lifestyle	(-35)- 105	0.50±24.32	0.00
Stress	(-19)- 169	25.65±30.30	16.50
Sleep	0 - 36	03.24±03.98	3.00
Bowel Toxicity	0 - 18	02.47 ±03.80	0.00
Blood Sugar	0-110	03.83±19.09	0.00
Inflammation and Pain	0 - 40	06.27±10.55	0.00
Diet	(-10)-32	06.13 ±06.61	05.00
SBP	0 – 40	11.93±12.32	8.00
Overall CVD risk score	(-25)-490	75.39±72.06	61.00

Maximum= ≥265
Minimum= -73

The data presented in the table 4.6 reveals that out of 350 adult population, 30 (8.57%) of adults had pain or discomfort or pressure or heaviness in chest and out of these 30 adults, majority of them 19(5.43%) had pain in the center of the chest or left chest or left arm, and 17(4.86%) had difficulty in talking, weakness of arm and/or leg on one side of the body or numbness on one side of the body.

Table 4.6: Frequency and percentage distribution of adult population for CVD risk based on WHO CVD risk assessment tool N=350

S. No.		Yes f (%)	No f (%)
	Angina and Heart attack		
1.	Pain or discomfort or any pressure or heaviness in your chest	30(8.57)	320(91.42)
2.	Pain in the center of the chest or left chest or left arm	19(5.43)	331(94.57)
3.	Pain when walk at an ordinary pace on level or when walk uphill or hurry.	07(2.0)	343(98.0)
4.	Slow down if get the pain while walking	10(2.86)	340(97.14)
5.	Pain go away if stand still or if take a tablet under the tongue	1(0.29)	349(99.71)
6.	Pain go away in less than 10 minutes	8(2.29)	342(97.71)
7.	Had a severe chest pain across the front of chest lasting for half an hour or more.	9(2.57)	341(97.43)
	Stroke and TIA		
8.	Had difficulty in talking, weakness of arm and/or leg on one side of the body or numbness on one side of the body.	17(4.86)	333(95.14)

5. Discussion

The survey in the present study reveals that most of the adult population (44.57%) belonged to under 30 years of age, 5.43% of adults were smoking less than 20 cigarettes/day while (1.14%) of adults were smoking more than 20 cigarettes/day and 17.14% were consuming alcohol, 14.85% of adults had SBP between 140-149mmHg, 15.43% of adults were doing moderate exercise once a week. The findings of the study were similar to the study conducted by Krishnan, A [6] on prevalence of risk factors for non-communicable disease in a rural area of Faridabad district of Haryana. The results showed that daily

smoked tobacco was 41% for men and 13% for women, 24.6% of them were consuming alcohol, 77.8% for men and 54.5% for women were doing at least 150 minutes of physical activity in a week. 10.7% among men and 7.9% among women (SBP≥140) were on antihypertensive drugs.

6. Conclusion
The study concluded that majority of the adult population below 30 years of age were found at low risk of developing CVD. The study findings revealed that cardiovascular risk has significant association with age (p=0.000), gender (p=0.005), educational status (p=0.000), heard of CVD (p=0.019), history of heart attack (p=0.000), family history (p=0.001), alcohol (p=0.000), BMI (p=0.000), SBP (p=0.000), blood sugar (p=0.005) at the level of ($p \leq 0.05$).

7. Recommendations
The similar study can be conducted among adult population of urban area. A study can be conducted to evaluate the effectiveness of mass awareness programme on adults in terms of knowledge and lifestyle practices regarding prevention of cardiovascular diseases. A comparative study can be done on male and female adult population of rural and urban area.

8. Acknowledgement

9. References
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