AN EPIDEMIOLOGICAL STUDY ON THE ASSESSMENT OF CARDIOVASCULAR HEALTH STATUS AMONG MEDICAL DOCTORS IN LUMBINI PROVINCE, NEPAL

Sudhir Kumar Shah[1]

ABSTRACT

INTRODUCTION

Cardiovascular diseases remain the leading contributor to global mortality, accounting for approximately 17.9 million deaths annually, which constitutes nearly one-third of all deaths worldwide. In order to reduce the burden of CVD, we first need to assess cardiovascular health status of population. The health status of doctors is critically important, as optimal physical and metabolic well-being is essential for maintaining effective clinical performance in demanding healthcare settings.

MATERIAL AND METHODS

In this cross sectional study, cardiovascular health status of 354 sampled doctor's population of Lumbini Province were assessed using pre-designed and pre-tested semi structured questionnaire from August 2022 to December 2022. Samples were taken from doctor's population using non probability purposive sampling technique. Blood pressure, Blood glucose, Blood cholesterol, Body height and weight were measured using standard guidelines.

RESULTS

Mean age of study population was 37.89 ±7.70 years. Hypertension was seen among 22% of doctor's population. Among doctors, 58% had ideal level of fasting blood sugar and 77% had ideal level of cholesterol level. The present study showed substantially high prevalence of obesity BMI > 23(65%) among doctors population. Married were more obese (65%), hypertensive (26%) and diabetics (14%) compared to unmarried.

CONCLUSION

The study demonstrates a considerable burden of major cardiovascular risk factors—including hypertension, diabetes mellitus, dyslipidaemias, and increased body mass index—among doctors, warranting serious attention. Healthy lifestyle measures might reduce burden of CVD which could be evaluated in future research.

KEYWORDS

Cardiovascular disease, Diabetes Mellitus, Hypertension, Hypercholesterolemia, Obesity

1. Department of Community Medicine, Universal College of Medical Sciences, Bhairahawa, Nepal.

https://doi.org/10.3126/jucms.v13i03.88763

For Correspondence
Dr. Sudhir Kumar Shah
Department of Community Medicine,
Universal College of Medical Sciences
Bhairahawa, Nepal,
Email: drsudhirkshah93@gmail.com

INTRODUCTION

Cardiovascular diseases remain the leading contributor to global mortality, accounting for approximately 17.9 million deaths annually, which constitutes nearly one-third of all deaths worldwide.[1] Diabetes mellitus, hypertension, and increased body weight are well-established and interrelated risk factors contributing significantly to the global burden of cardiovascular diseases.[2] The health status of doctors is critically important, as optimal physical and metabolic well-being is essential for maintaining effective clinical performance in demanding healthcare settings.

Diabetes, hypertension, and obesity are one of the top five continuing risk factors for cardiovascular deaths in the world.[3] Obesity is increasing substantially and is one of the major contributors of disease prevalence due to its pathophysiological link to other cardiovascular risks such as hypertension and diabetes. Despite their medical knowledge, doctors often experience sedentary work patterns, occupational stress, inadequate rest, and irregular dietary habits, which may increase their vulnerability to cardiovascular diseases.[4] However, they are also known to have a sedentary lifestyle with high levels of stress, lack of proper rest and irregular eating habits making them highly vulnerable to CVD.[5]

MATERIAL AND METHODS

A cross-sectional study was conducted among doctors employed in selected government and private hospitals of Province 5, Nepal. Doctors from basic and dental departments were also enrolled in the study conducted from August 2022 to December 2022. Ethical approval [ref no.689/2021] was obtained from the Ethical Review Board (ERB) of Nepal Health Research Council prior to data collection. Written informed consent was obtained from all participants after explaining the objectives of the study and their right to withdraw without any obligation.

Sample size was calculated using cochran's formula. Sample size (n) = Z^2 Pq/ d^2 where, Z = 1.96 at 95% confidence level, P = 0.366, q = 1 - p = 0.64 and d = margin of error (at 5%). Using an estimated hypertension prevalence of 35.6% and an absolute precision of 5%, the sample size was computed as 354. The study ultimately included 354 doctors selected through a non-probability purposive sampling method. A Pre-tested structured questionnaire were used for data collection. Data were collected using a structured questionnaire consisting of three components. The first component gathered socio-demographic details such as age, sex, and marital status. The second component focused on lifestyle-related behaviors, including smoking habit, alcohol intake, and physical activity. The third component included anthropometric and biochemical measurements, namely body height, body weight, fasting blood glucose, total cholesterol, and blood pressure.

Using a standard aneroid sphygmomanometer with a 12 × 34 cm cuff, blood pressure was recorded through the auscultatory method. Measurements were taken while participants were seated in a relaxed position, with proper arm support at heart level. Three readings from the right arm were obtained consecutively, and the mean of these readings represented the participant's blood pressure. Study participants were considered hypertensive when the mean systolic blood pressure was ≥140 mm Hg, the mean diastolic blood pressure was ≥90 mm Hg, or if they were receiving antihypertensive therapy at the time of the study.[7]

Selected doctors in the study were requested for blood examination for evaluation of diabetes and hyperlipidemia. Sample were collected by skilled lab assistant and were transported to department of biochemistry under aseptic condition for required biochemical analysis.

Blood Sugar were measured by Glucose oxidase/Peroxidase method (GOD/POD).

For the diagnosis of Diabetes, previous history of Diabetes were considered. If fasting blood sugar level were more than or equal to 126 mg/dl and postprandial more than or equal to 200mg/dl they were considered as diabetic. Total cholesterol: ideal (<200 mg/dl) and poor (≥200 mg/dl) were considered for hyperlipidemia.[4]

Height and weight of the study participants were measured following standard procedures. Height was measured to the nearest 0.1 cm using a non-stretchable measuring tape with participants standing barefoot against a wall, while weight was measured to the nearest 0.1 kg using a calibrated electronic weighing scale. Body mass index was categorized using WHO-recommended cut-off values for Asian populations, with BMI ≥23 kg/m² indicating excess body weight and values below this threshold considered normal. [5]

RESULTS

Mean age of the study population was 37.89±7.70. Most (59.3%) of the study participant were female. Majority (71.5%) of study population were married.

Cardiovascular health status of the study participants

In this study, approximately one-fifth of the participants were identified as having hypertension (table 1). Mean systolic and diastolic pressures were found to be 114±15 mm of hg and 73±10 mm of hg respectively (table-2).

Diabetes mellitus was observed in nearly fourteen percent of the study population. Mean fasting blood sugar value was found to be 101 ±28 mg/dl. Mean Total Cholesterol (TC) values were found to be 136 (±38) (table 2). A high proportion of doctors (65%) were found to have elevated body mass index values based on Asian population criteria. Poor level of cholesterol was seen among 23% of study population (table 1).

Table 1. Cardiovascular health status of study participants

Cardiovascular health status		Frequency (n=354)	Percentage (%)
Hypertension			
	Yes	75	21.2
	No	279	78.8
Fasting blood sugar			
	Ideal (<100mg/dl)	204	57.6
	Intermediate (100-125mg/dl)	101	28.5
	poor (>125mg/dl)	49	13.8
Total cholesterol			
	Ideal	273	77.1
	poor	81	22.9
Body Mass Index			
	Ideal (≤23kg/m2)	125	35.3
	poor (>23kg/m2)	229	64.7

Association of few Socio-demographical factors with cardiovascular health status of the study participants

Among doctors, Male were more hypertensive (34.7%) compared to female (11.9%) and this difference was found to be statistically significant (p=0.001). Hypertensive and Diabetics were observed more in the study population who did not indulge in any form of physical activity then who indulged in some form of physical activity and this difference was also found to be statistically significant (table 3). Male were more hypercholesterolemia 29.2% compared to female 18.6% and this association was found to be statistically significant. Obesity were observed more in age greater than 38 compared to age less than 38 and this association was found to be statistically significant. Male (66.7%) and Female (66.3%) comprises almost equal proportion for significantly higher prevalence rate of obesity among the study population. Among doctors, married were more obese (65%), hypertensive (26%) and diabetics (14%) compared unmarried and this association was also found to be statistically significant (table 3).

Table 2. Distribution of study participants fasting sugar, systolic blood pressure, diastolic blood pressure and total cholesterol

Statistics	FBS (mg/dl)	SBP (mm of hg)	DBP (mm of hg)	TC (mg/dl)
Mean	101	114	73	136
SD	28	15	10	38
Minimum	62	90	60	70
Maximum	232	168	95	310

FBS: fasting blood sugar, SBP: systolic blood pressure, DBP: diastolic blood pressure, TC: total cholesterol, SD: standard deviation

Table 3. Association of socio demographical with cardiovascular health status

Socio-demographical Variable		Hypertension		Diabetes		Hypercholesterolemia		Obesity	
		Yes	No	Yes	No	Yes	No	Yes	No
Gender	Male	50(34.7)	94(65.3)	25(17.4)	119(82.6)	42(29.2)	102(70.8)	96(66.7)	48(33.3)
	Female	25(11.9)	185(88.1)	25(11.9)	185(88.1)	39(18.6)	171(81.4)	133(63.3)	77(36.7)
	p value	<0.001**		0.148		0.020*		0.519	
Age	≤38	34(17.3)	162(82.7)	24(12.2)	172(87.8)	39(19.9)	157(80.1)	110(56.1)	86(43.9)
	>38	41(25.9)	117(74.1)	26(16.5)	132(83.5)	42(26.6)	116(73.4)	119(75.3)	39(24.7)
	p value	0.049		0.258		0.137		<0.001**	
Marital status	Never Married	5(9.3)	49(90.7)	11(20.4)	43(79.6)	13(24.1)	41(75.9)	32(59.3)	22(40.7)
	Currently married	65(25.7)	188(74.3)	35(13.8)	218(86.2)	61(24.1)	192(75.9)	164(64.8)	89(35.2)
	Separated	0(0)	7(100)	0(0)	7(100)	0(0)	7(100)	7(100)	0
	Divorced	2(50)	2(50)	1(25)	3(75)	2(50)	2(50)	4(100)	0
	Widowed	0	3(100)	0	3(100)	0	3(100)	0	3(100)
	Cohabitating	3(9.1)	30(90.9)	3(9.1)	30(90.9)	5(15.2)	28(84.8)	22(66.7)	11(33.3)
	p value	0.009*		0.483		0.305		0.031*	
Smoking	Yes	17(35.4)	31(64.6)	7(14.6)	41(85.4)	14(29.2)	34(70.8)	21(43.8)	27(56.2)
	No	58(19)	248(81)	43(14.1)	263(85.9)	67(21.9)	239(78.1)	208(68.0)	98(32.0)
	p value	0.009*		0.922		0.265		0.001*	
Alcohol	Yes	38(27.1)	102(72.9)	21(15.0)	119(85.0)	36(25.7)	104(74.3)	96(68.6)	44(31.4)
	No	37(17.3)	117(82.7)	29(13.6)	185(86.4)	45(21.0)	169(79.0)	133(62.1)	81(37.9)
	p value	0.027*		0.702		0.305		0.216	
Physical activity	Yes	7(9.2)	69(90.8)	5(6.6)	71(93.4)	7(9.2)	69(90.8)	29(38.2)	47(61.8)
	No	68(24.5)	210(75.5)	45(16.2)	233(83.8)	74(26.6)	204(73.4)	200(71.9)	78(28.1)
	p value	0.004*		0.033*		0.001*		<0.001**	

*indicates statistically significant and ** indicates statistically highly significant at α=5%

DISCUSSION

In the present study the prevalence of hypertension among doctors was found to be 21.2%. This is in concordance with a hypertension prevalence study conducted in Tamil Nadu where the prevalence of hypertension was 21.6% in similar study population.[8] Also, Fanghanel salmon G et al reported that the prevalence of hypertension was 22.2% among health care workers.[9] Kurtal S et al reported that the prevalence of hypertension was 13.5% among physician working at university hospital which was much lesser than the present study.[10]

Gupta A et al in their study among physicians reported that the prevalence of diabetes was 9.4% among males and 12.9% among females.[11] The prevalence of diabetes mellitus was found to be 15.6%. Sharma et al in their study among tertiary hospital employees.[12] The present study also revealed the similar prevalence of diabetes among the study population comprised of doctors.

The high prevalence of increased body mass index observed in this study may be attributed to sedentary occupational routines and insufficient physical activity among doctors. Sharma D et al in their study also found the prevalence of obesity to be 80% among tertiary hospital employees.[12] Gupta et al in their study found the prevalence of obesity to be 48.6% among male and 51.4% among female which was much lesser than the present study.[11]

This substantially high prevalence of obesity as per Asian population guideline may be owing to the sedentary life style and lack of physical activity among the study population. The high prevalence of obesity among highly educated study population of a tertiary care hospital suggests serious lack of awareness regarding physical activity and diet.[13]

CONCLUSION

The study demonstrates a considerable burden of major cardiovascular risk factors—including hypertension, diabetes mellitus, dyslipidaemias, and increased body mass index—among doctors, warranting serious attention. Large proportion of the study participates were having poor BMI and poor level of cholesterol. Males were more hypertensive and hypercholesterolemia. Married doctors were more hypertensive, diabetic and obese compared to unmarried. Healthy lifestyle measures such as physical activity, healthy diet, medication and good amount of sleep in the prevention of CVD could be further evaluated in future research.

ACKNOWLEDGEMENT

The financial assistance for conducting the study was provided by Nepal Health Research Council. I gratefully acknowledge the cooperation of all the doctors who participated in the study.

REFERENCES

1 World Health Organization. Cardiovascular diseases (CVDs) 2021.

2. World Health Organization. Hypertension. Key facts: World Health Organization; 2023.

3. Government of Nepal. Ministry of Health and Population. National Health Policy 2019.

4. American Diabetes Association Professional Practice Committee. Prevention or Delay of Diabetes and Associated Comorbidities: Standards of Care in Diabetes-2025. .

5. International Diabetes Federation (IDF). IDF Diabetes Atlas 10th EDITION IDF; 2021

6. Ramachandran A, Snehalatha C, Yamuna A, Murugesan N. High prevalence of cardiometabolic risk factors among young physicians in India. The journal of the association of physicians of India. 2008 Jan; 56, 17–20.

7. World Health Organization. WHO STEPS surveillance manual: the WHO STEP wise approach to chronic disease risk factor surveillance. World Health Organization, 2005.

8. Hedge SK, Kumar G, Balaji R. Prevalence of Diabetes, Hypertension and Obesity among Doctors and Nurses in a Medical College Hospital in Tamil Nadu, India. National journal of reserch in community medicine. 2015; 4:235-39.

9. Fanghänel-Salmón Gl. The prevalence of risk factors for coronary disease in workers of the Hospital General de México. Salud Publica Mex. 1997 Sep-Oct; 39(5): 427-32.

10. Kurtul S, Ak FK, Türk M. The prevalence of hypertension and influencing factors among the employees of a university hospital. African health sciences.2020 Dec; 20(4):1725-33.

11. Gupta A, Gupta R, Lal B, Singh AK, Kothari K. Prevalence of coronary risk factors among Indian physicians. The journal of the association of physicians of India. 2001 Dec; 49:1148-52.

12. Sharma SK, Ghimire A, Radhakrishnan J, Thapa L, Shrestha NR. Prevalence of hypertension, obesity, diabetes, and metabolic syndrome in Nepal. International journal of hypertension. 2011; 821971

13. Al Alwan I, Badri M, Al-Ghamdi M, Aljarbou A, Alotaibi H, Tamim H. Prevalence of Self-reported Cardiovascular Risk Factors among Saudi Physicians: A Comparative Study. International journal of health sciences.2013; 7(1), 3–13.