E-ISSN 2250-0944
ISSN 2250-1150
doi: 10.31838/ijprt/15.2.46

Research Article

To Estimate the Risk of Cardiovascular Disease in Healthcare Workers

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Received: 9.05.25, Revised: 12.06.25, Accepted: 14.07.25

ABSTRACT

Background: A major cause of mortality around the world, cardiovascular diseases (CVDs) are most prevalent in countries like South Asia, Central Asia, and Eastern Europe, including Pakistan, with a twin disease burden of communicable and non-communicable disease. HCWs, even though they are at the forefront of fighting CVDs, are most vulnerable because of work-related stress and uneven shifts. By employing the QRISK2 calculator, in the present research CVD risk among healthcare workers is attempted to be measured. By identifying those at risk, special measures can be implemented for their well-being over the long term and their capacity to provide high-standard treatment.

Study Design: A descriptive cross-sectional study.

Duration and Place of Study: This study was conducted in People's University of Medical and Health Sciences for Women Nawabshah from February 2024 to February 2025.

Objective: To estimate the risk of cardiovascular disease in healthcare workers.

Methodology: In this cross-sectional descriptive study, 200 health profession workers aged 25-60 years had their cardiovascular disease (CVD) risk factors determined. Biochemical and modified QRISK2 questionnaires were used to gather data. Demographic, lifestyle, and physiological variables were processed with SPSS 22. Descriptive statistics, Chi-square, and Independent Sample T-tests were used, with $p<0.05$ as the level of significance. To establish study validity, ethical approval and informed consent were sought.

Results: Using the QRISK2 calculator, the cardiovascular disease (CVD) risk was estimated in 200 health care workers (HCWs). They were predominantly men aged 36 years on average. Paramedics, light smokers, males, and individuals with diabetes or a positive family history were at increased risk of CVD. Very few of them were categorized as high-risk subjects, and the majority were low-risk. The findings indicate the need for individually addressed preventative measures in the at-risk groups among the healthcare workers.

Conclusion: Healthcare workers involved in this research had a low overall risk of cardiovascular disease (CVD).

INTRODUCTION

One of the world's most serious health issues are cardiovascular diseases (CVDs), such as heart disease, peripheral arterial disease, stroke, and other conditions that involve the heart and blood vessels [1]. These diseases can range from extremely mild to very severe, with some individuals presenting blatant symptoms and others being completely asymptomatic [2,3]. Because CVDs unfortunately kill millions of people each year, public health needs to deal with this crisis issue [4,5]. Calculators such as the QRISK2 calculator, which calculates the risk of developing cardiovascular events such as

heart attack or stroke, have been created to help individuals identify their risk [6].

Cardiovascular disease is one of the leading causes of mortality in South Asia, claiming millions of lives each year. Similar to most other parts of the world, Pakistan faces a "double burden of disease," where communicable and non-communicable diseases are prevalent [7]. The incidence of CVD has been rising constantly in South Asia, which highlights the necessity to have effective management and prevention plans in place to counter this unfolding health epidemic [8]. Health workers, including doctors, nurses, and paramedics, are in the forefront of battles against cardiovascular diseases and other health hazards [9], but they are also more likely to develop cardiovascular diseases themselves due to the stressful nature of their work, exposing them to several risk factors, including chronic stress and non-conventional shift working.

By assessing the risk of cardiovascular disease (CVD) among healthcare workers (HCWs) with the QRISK2 calculator in this study, we can fill an important knowledge gap. Through categorizing healthcare workers as low, moderate, and high risk, we are better able to determine the prevalence of risk for CVD in this group.

METHODOLOGY

This is a descriptive cross-sectional study that explores the risk factors of CVD among health professionals. A total of 200 participants were involved in this study. In this study, all the participants were health professionals and their age ranged from 25 years to 60 years.

Exclusion Criteria

Patients with cardiovascular disease history were not included in this study. Furthermore, patients with comorbid illness such as cancer or chronic liver diseases were excluded in this study.

Gender, marital status, age, ethnicity, and work status as a healthcare worker were some of the demographic parameters assessed. In addition, CVD risk factors were measured, including diabetes, kidney disease, smoking status, blood pressure, heart disease family history, and physical fitness level. Biophysiological measurements, including BMI, height, weight, and blood pressure, were also recorded. The urea, creatinine, HDL, LDL, triglycerides, and cholesterol levels were also measured by biochemical assays. A pre-modified QRISK2-based questionnaire was applied to collect data. Validity for the study was ensured through informed consent. This research was approved by the Ethical Review Committee. Statistical analysis was conducted using Excel 365 and SPSS 22, with 0.05 as the level of significance. Continuous variables and categorical variables were analyzed using Independent Sample T-tests, Chi-square tests, and descriptive statistics.

RESULTS

There were a total of 200 people included in this study. All the participants were healthcare workers. Majority of the participants were male. The mean age was 36 years. The mean height was 168.3 cm. The mean weight was 71.3 kg. The mean BMI was 25.3 kg/m2.

Table number 1 shows the socio-demographic characteristics of the healthcare workers.

Table No. 1:

Characteristics	N	%
Gender		
• **Male**	124	62
• **Female**	76	38
Healthcare workers status		
• **Paramedics**	68	34
• **Nurses**	80	40
• **Doctors**	52	26
Marital Status		
• **Single**	52	26
• **Married**	144	72
• **Widowed**	4	2

Table number 2 shows cardiovascular risk factors of healthcare workers.

Table No. 2:

Characteristics	N	%
Family History		

• **Yes**	62	31
• **No**	138	69
History of diabetes		
• **Type 1**	2	1
• **Type 2**	10	5
• **None**	188	94
Smoking status		
• **Light smoker**	12	6
• **Non-smoker**	178	89
• **Ex-smoker**	8	4
• **Moderate smoker**	2	1
Physical activity		
• **Moderate Activity**	88	44
• **Sedentary lifestyle**	52	26
• **Active**	60	30
BMI (kg/m2) Categories		
• **Below 18.5**	6	3
• **18.5-24.9**	96	48
• **25.0-29.9**	68	34
• **30.0-40.0**	30	15
Mean values		
Total Cholesterol Level (mg/dl)	185.83	
Systolic BP (mmHg)	122.98	
Diastolic BP (mmHg)	79.45	
LDL Level (mg/dl)	106.87	
HDL Level (mg/dl)	47.53	
Cholesterol/HDL Ratio	4.04	
Triglyceride Level (mg/dl)	181.13	

Table number 3 shows the risks of cardiovascular diseases in the study population.

Table No. 3:

	Risk of CVD in Healthcare workers		
Variables	**Low risk (<10%)**	**Intermediate risk (10%-<20%)**	**High risk (>20%)**
Gender			
• **Male**	87.9	8.3	3.8
• **Female**	97.9	2.1	0
History of diabetes			
• **Type 1**	50	0	50
• **Type 2**	33.3	41.7	25
• **None**	92.8	6.6	0.6
Smoking status			
• **Light smoker**	50	35.8	14.2
• **Non-smoker**	92.6	5.8	1.6
• **Ex-smoker**	80	20	0
Moderate smoker	100	0	0
Healthcare workers status			

• **Paramedics**	82.9	11.4	5.7
• **Doctors**	88.8	9.4	1.8
• **Nurses**	96.1	3.9	0
Family History			
• **Yes**	89.3	8	2.7
• **No**	87.6	9.9	2.5
Marital Status			
• **Single**	60.1	39.9	0
• **Married**	85.7	10.6	3.7
• **Widowed**	100	0	0

DISCUSSION

The aim of this research was to evaluate cardiovascular risk factors among healthcare workers (HCWs) using the QRISK2 calculator and then classify them as low, middle, and high-risk groups. There were a total of 200 participants with a mean age of 36 years consisting of 124 males and 76 females. Based on the results, there was a statistically significant difference ($p = 0.001$) between the mean risk score of females and males, the latter being significantly higher (3.9%). There were 68 paramedics, 80 nurses, and 52 doctors among the participants. Our research indicated a lower risk of cardiovascular disease (CVD) of 3.94% compared to previous studies, but Saudi Arabian (95.4%) and Nigerian (40%) research indicated significantly higher risks [10-13]. The gender distribution among the participants agreed with findings from studies conducted in Turkey and Lahore, suggesting differences which were likely due to study design and location [14, 15]. In addition, the average age of our study's participants was consistent with those reported in studies from India and Nigeria, suggesting that healthcare professional groups within most geographic locations have a uniform adult age group [16, 17]. In terms of risk factors, our study identified that, unlike previous studies, the prevalence of diabetes and smoking was lower, but that of positive family history was higher [18]. The prevalence of BMI and physical activity levels were consistent with some studies but not others [19]. The men in our study were at a higher cardiovascular risk than the women, consistent with earlier studies, as were light smokers, those with type 1 diabetes, and those with a favorable family history [20]. Interestingly, paramedics were more vulnerable than doctors and nurses, contrary to past studies which revealed that doctors were most vulnerable. These differences illustrate how occupational and environmental determinants influence healthcare workers' cardiovascular risk profiling.

CONCLUSION

Healthcare workers involved in this research had a low overall risk of cardiovascular disease (CVD).

Funding source

This study was conducted without receiving financial support from any external source.

Conflict in the Interest

The authors had no conflict related to the interest in the execution of this study.

Permission

Prior to initiating the study, approval from the ethical committee was obtained to ensure adherence to ethical standards and guidelines.

REFERENCES

1. Shah SL, Ali H, Hussain S, Ullah SA. Cardiovascular Risk Assessment Among Healthcare Workers in District Mardan Using the QRISK2 Calculator: A Multicenter Cross-Sectional Study. Pakistan Heart Journal. 2024 Mar 30;57(1):47-51.
2. Rangarajan R, Premnath SM. Evaluating Cardiovascular Disease Risk in Young Healthcare Professionals: Insights from Q-Risk 3 Calculations. Indian Journal of Occupational and Environmental Medicine. 2025:10-4103.
3. Esan A, Adeleye J, Azeez TA. Reseach Paper: Cardiovascular Risk Profile of Apparently Healthy Workers in a Tertiary Hospital in Nigeria. Assessment.;20:9.
4. Benjamin EJ, Muntner P, Alonso A, Bittencourt MS, Callaway CW, Carson AP, Chamberlain AM, Chang AR, Cheng S, Das SR, Delling FN. Heart disease and stroke statistics—2019 update: a report from the American Heart

Association. Circulation. 2019;139(10):e56-28

5. Cooney MT, Cooney HC, Dudina A, Graham IM. Assessment of cardiovascular risk. Curr Hypertens Rep. 2010;12(5):384-93. 6. ClinRisk Ltd. QRISK®3: The Future: Press Release February 2023. Available at: https://clinrisk.co.uk/ClinRisk/index.php/news/. Accessed September 18, 2023
6. Azeez TA. Cardiovascular Risk Profile of Apparently Healthy Workers in a Tertiary Hospital in Nigeria. Caspian Journal of Health Research. 2021 Jan 1.
7. Pillay R, Rathish B, Philips GM, Kumar RA, Francis A. Cardiovascular and stroke disease risk among doctors: a cross-sectional study. Tropical doctor. 2020 Jul;50(3):232-4.
8. Olubiyi OA, Rotimi BF, Afolayan MA, Alatishe-Muhammad BW, Olubiyi OM, Balami AD. The ten-year risk of developing cardiovascular disease among public health workers in North-Central Nigeria using Framingham and atherogenic index of plasma risk scores. BMC Public Health. 2022 Apr 27;22(1):847.
9. Sijuade SA. Prevalence of Cardiovascular Disease Risk Factors Among Health Professionals in A Tertiary Care Hospital in India.
10. Raheem A, Ahmed S, Kakar AW, Majeed H, Tareen I, Tariq K, et al. Burden of cardiovascular diseases in South Asian region from 1990 to 2019: Findings from the global burden of disease study. Pak Heart J. 2022;55(1):15-21.
11. Alam MN, Ekka A, Khatoon S. A Ten-year Risk Assessment Study of Cardiovascular Events Among Adults Visiting a Tertiary Care Institution in Northern India. Nat J Lab Med. 2022;11(3):MO13-MO16
12. Kuan PX, Chan WK, Chua PF, Yeo J, Sapri FE, Bujang MA, et al. Lifestyle factors associated with cardiovascular risk among healthcare workers from the tertiary hospitals in Sarawak. Malays Fam Physician. 2020;15(1):15-22
13. Ambakederemo TE, ChikezieEU. Assessment of some traditional cardiovascular risk factors in medical doctors in Southern Nigeria. Vasc Health Risk Manag. 2018;14:299-309.
14. Badawy MA, Naing L, Johar S, Ong S, Rahman HA, Tengah DS, et al. Evaluation of cardiovascular diseases risk calculators for CVDs prevention and management: scoping review. BMC Public Health. 2022;22(1):1742
15. Habib Z, Akram S, Kauser R. Cardiovascular diseases and their risk factors among office workers of Lahore, Pakistan. Asian J Multidiscipli Stud. 2018;6(9):60-2
16. Ezber R, Gülseven ME, Koyuncu A, Sar G, Imek C, Sar G. Evaluation of cardiovascular disease risk factors in healthcare workers. Family Med Prim Care Rev. 2023;25(2):150-4.
17. Pappaccogli M, Ravetto Enri L, Perlo E, Di Monaco S, Pignata I, Baratta F, et al. Assessment of a non-physician screening program for hypertension and cardiovascular risk in community pharmacies. Nutr Metab Cardiovasc Dis. 2019;29(12):1316-22
18. Sharma D, Vatsa M, Lakshmy R, Narang R, Bahl VK, Gupta SK. Study of cardiovascular risk factors among tertiary hospital employees and their families. Indian Heart J. 2012;64(4):356-63.
19. Doran K, Resnick B. Cardiovascular Risk Factors of Long-Term Care Workers. Workplace Health Saf. 2017;65(10):467-77.
20. Copertaro A, Bracci M, Barbaresi M. Assessment of plasma homocysteine levels in shift healthcare workers. Monaldi Arch Chest Dis. 2008;70(1):24-8.