

Evaluation of Public Awareness regarding Risk Factors and Warning Signs of Heart Attack and Stroke: A Cross-Sectional Study in DHQ Hospital, Kohat

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Abstract

Background: Globally cardiovascular diseases such as Heart attack and stroke are the leading causes of sickness and death. For timely recognition, early intervention and better outcome people knowledge about their risk factor and warning signs is crucial. However, data from Pakistan specially from district level is quite limited. **Objective:** To assess public awareness regarding risk factor, warning sign

and preventive responses related to heart attack and stroke among adult population in Kohat. **Methods:** A hospital-based cross-sectional study was conducted among 120 adults aged ≥ 20 years using a structured questionnaire. Non probability consecutive sampling technique was used to select participants. Awareness regarding cardiovascular risk factors, warning signs and responses and preventive behavior was assessed. For data analysis SPSS version 27.0 was used. Descriptive statistics were shown in frequencies and percentages. To find out associations Kruskal–Wallis H test and Pearson’s chi-square test were applied. *P* value less than 0.05 was considered statistically significant. **Results:** Awareness regarding common cardiovascular risk factors such as stress (91.1%), obesity (85.8%), hypertension and hyperlipidemia (83.3%), and physical inactivity (78.3%) were reported by the people. Identification of major warning signs of heart attack and stroke was high. (95%) responded that they would call an ambulance if they thought someone needed help. Awareness of cardiovascular risk factors showed association with age ($p=0.002$), gender ($p=0.016$) and education level ($p=0.043$). **Conclusion:** People generally know about common heart risks and warning signs, but there are still important gaps in knowledge, especially about less well-known risks and specific signs of a stroke. These findings show that we need health education programs in the community to increase awareness about heart health and encourage people to seek medical help when needed.

INTRODUCTION

Cardiovascular diseases (CVDs), such as heart attack and stroke, remains a major global cause of morbidity and mortality, and represent a significant disease burden in population in coming decades (1)(2). Timely recognition of risk factors and warning signs is necessary for their better management and outcomes, However most of the people is unaware and public awareness is suboptimal in many populations (3)(4)(5)(6)(7)(8). Global studies, including most of the African states, Europe, North America, and south Asian countries, always account that most of their population including adults are unable to identify even a single risk factor or warning signs for heart attack and stroke (1)(9)(10)(11)(12). For example, About more than half of participants in rural Tanzania and approximately half of CVD patients in Ethiopia have poor knowledge of risk factors and warning signs (1)(9).

Sociodemographic and socioeconomic factors, such as level of education, income disparities, and urban versus rural residence, are frequently correlated with differences in CVD awareness and risk assessment (13). Helpless communities, different ethnic minorities, and migrant populaces shows lower knowledge and higher risk, emphasizing the significance of socially conscious and localized responses (14). There are also genders differences exist, as most women don't realize their risk for heart disease and thinks its a male problem, but this is not true (15).

Although more people in high-income countries know about their health issues very well, but despites this awareness many young adults and poorer population didn't get proper treatment for serious problem such as high blood pressure, diabetes and high cholesterol level (13)(16)(17)(18). Environmental factors, such as long-term contact with air pollution, further increases chances of CVD and stroke, however most of the people even don't know about these uncommon risk factors (19). Global and regional studies have given us helpful information, but there is not enough data from South Asia, especially Pakistan, where heart disease is a big problem and healthcare resources are insufficient. Most studies have looked so for people from Africa, Middle East, Europe, or North America, there are not many studies that examine both the risk factors and warning signs in the same group of people, or that investigate how social and demographic factors affect knowledge in relation to health care systems. This gap shows that we need specific research at places like DHQ Hospital in Kohat to help create health programs and strategies that fit the local culture. Fixing these problems is important for creating good prevention programs, helping people notice warnings early, and reducing the number of heart attacks and strokes in Pakistan and similar places.

METHODOLOGY

This study was conducted as a hospital-based cross-sectional survey at District Headquarter (DHQ) Hospital, Kohat. The main purpose of this to assess the public awareness regarding risk factors and warning signs of heart attack and stroke. The study population consist of adult individuals aged 20 years or older visiting the outpatient departments of the hospital and associate attendants during the data collection period. Participants were ingress using a non-probability consecutive sampling technique, whereby all eligible individuals who meet the inclusion criteria and consented to

participants were taken on until the required sample size was reached. Participants put in if they were 20 years of age or above, inclined to participate voluntarily, and able to provide informed consent. Participants were kept out if they were seriously ill or clinically unwell require immediate medical care, unable to provide informed consent, or had cognitive deficit that could affect their understanding of the questionnaire. Health professionals, include doctors, nurses, medical students and nursing students, were kept out to avoid professional bias. Additionally, participants a prior history of heart attack or stroke were excluded as past personal experience with these conditions could impact consciousness levels and responses.

The sample size was calculated using the standard formula for estimating a single population proportion: $n = Z^2 \times p \times q / e^2$, where n represents the required sample size, Z is the Z-score corresponding to the desired confidence level, p is the estimated population proportion, $q = 1 - p$, and e is the margin of error. A confidence level of 92% ($Z = 1.75$), an assumed population proportion of 0.5 due to the absence of local prevalence data, and a margin of error of 8% were used resulting in a minimum sample size of approximately 120 participants after applying finite population correction. Data were collected using a structured, interviewer-administered questionnaire developed following an extensive review of related literature and pretested prior to final use to ensure clarity and reliability. The questionnaire comprised sections assessing sociodemographic significance awareness related to risk factors of heart attack and stroke, recognition of alarming signs of heart attack recognition of warning signs of stroke, and response and preventive behaviors.

Data were put in as well coded and analyzed using the Statistical Package for Social Sciences (SPSS) version 27. Descriptive statistics were computed as frequencies and percentages. Due to non-normal distribution of awareness scores, the Kruskal–Wallis H test was used to compare awareness levels across diverse age groups. Pearson's chi-square test was applied to assess associations between awareness domains and categorical variables such as gender education level, and place of residence. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Demographic data of the study is shown in Section A. Out of 120 participants, majority of the respondents have age 40–49-year, followed by those with age 30–39 years and 20–29 years. Majority of the study sample were Females, about one-third participants were males. Most of the sample size respondents were married, illiterate, and resided in rural areas. More than half of the participants admit a positive family history of heart disease or stroke. In term of past medical history, diabetes mellitus was more common than hypertension, however majority participants account no known chronic illness. Most of the respondents were non-smokers while a small minority were Smoker. These findings show that most of the people studied live in the countryside, have low levels of education, and face many heart health risks.

Section A: *Demographic Information*

Variable	Categories	Frequency	Percentages (%)
Age	20–29	29	24.2%
	30–39	38	31.7%
	40–49	53	44.2%
Gender	Male	42	35.0%
	Female	78	65.0%
Marital Status	Single	21	17.5%
	Married	99	82.5%
Education Level	Illiterate	94	78.3%
	Educated	26	21.7%
Residence	Urban	26	21.7%
	Rural	94	78.3%
Family History of Heart Disease / Stroke	Yes	62	51.7%
	No	58	48.3%
Past Medical History	Hypertensi	7	5.8%
	on	42	35.0%
	Diabetes	71	59.2%
	None		
Smoking Status	Yes	12	10.0%
	No	108	90.0%

The participants' knowledge about the things that can lead to a heart attack and stroke is shown in Figure 1. 70% of people knew that smoking is a risk, while 30% didn't show much understanding. 83.3% of people understood that high blood pressure and cholesterol is a risk factor, while 16.7% did not know about it. 74.2% were aware that diabetes was a risk factor, while the remaining 25.8% were not aware. 85.8% believed that people who are overweight or obese carried a significant health risk because of this, while 14.2% were unsure. 78.3% of the respondents had learned about the dangers of inactivity, 21.7% did not know about the risk factor for inactivity. Eating foods high in salt or fat was recognized as a risk by 84.2% of the participants, while 15.8% showed little awareness. Most people 91.7% understood that too much stress raises the risk of heart attack or stroke, while only a small number 8.3% did not know this. 78.3% of participants said that family history played a role, while 21.7% were not aware of it. About 64.2% of people know that drinking alcohol can raise the risk of heart diseases, while 35.8% do not have good knowledge about it.

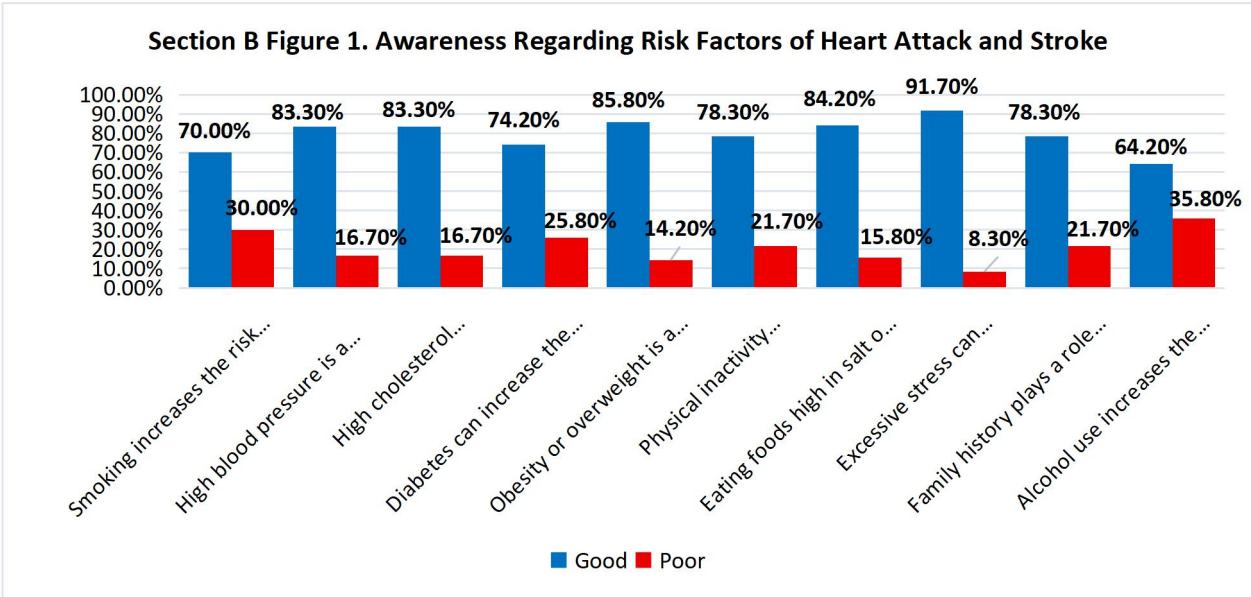


Figure 2 shows how well the people in the study recognize common warning signs of a heart attack. 90.4% identified chest pain or pressure as a warning sign, but a 9.6% did not understand. About 86.8% of people noticed shortness of breath, while 13.2% did not realize it. 83.8% realized that pain in the arms, neck, or jaw is a warning sign. However, 16.2% were unaware of this. 86.8% noticed sweating and dizziness correctly, while 13.2%

did not understand them well. 87.4% of the participants noticed their hearts beating fast or in an irregular way, while 12.6% did not know about it.

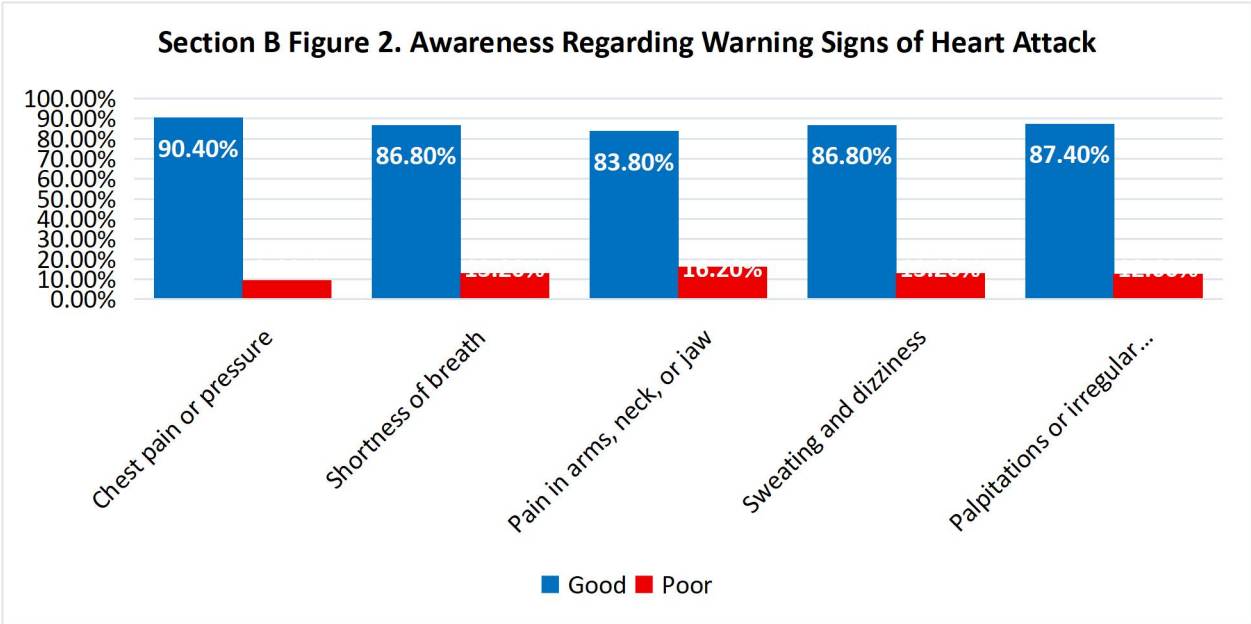


Figure 3 shows what the participants know about the warning signs of a stroke. Most people, 89.2%, were able to recognize sudden weakness or numbness in the face, arm, or leg. However, 10.8% did not understand this well. 80% of the participants noticed problems with speaking or understanding speech, while 20% did not realize it. About 72.5% of people reported sudden vision problems in one or both eyes, while 27.5% were not aware of this issue. A sudden, strong headache was seen as a warning sign by 82.5% of the people, while 17.7% did not recognize it. Almost 89.2% people recognized that they had problems with balance or coordination, but about 10.8% were not aware of it. Sudden dizziness was noticed by 90.8% of the people, while only 9.2% showed that they did not understand it well.

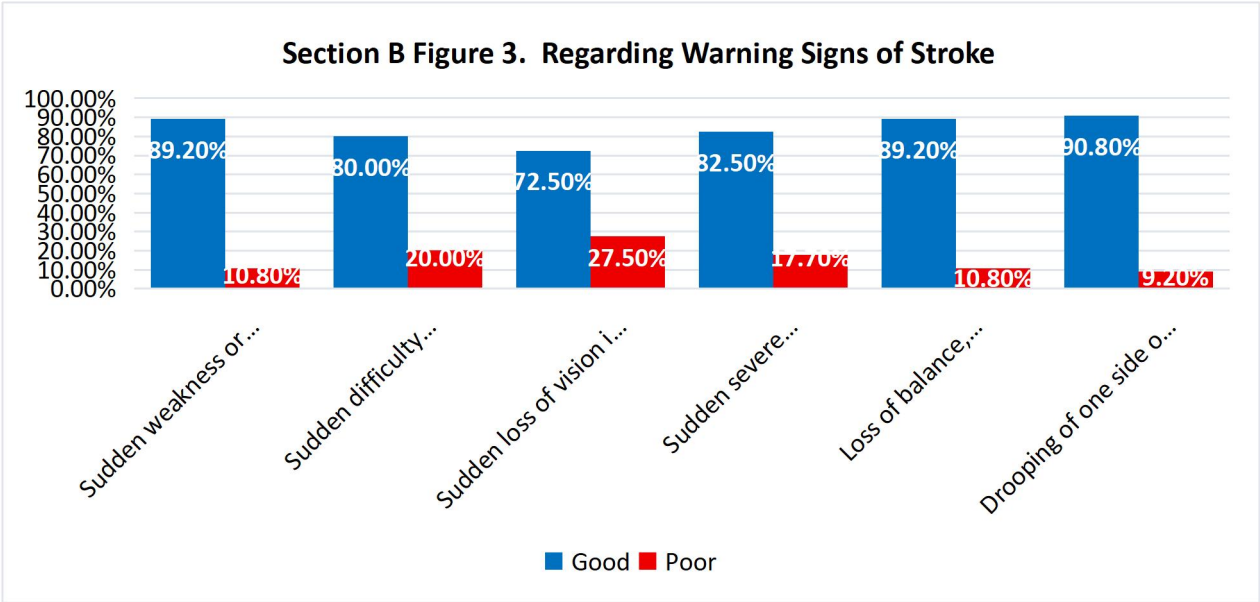
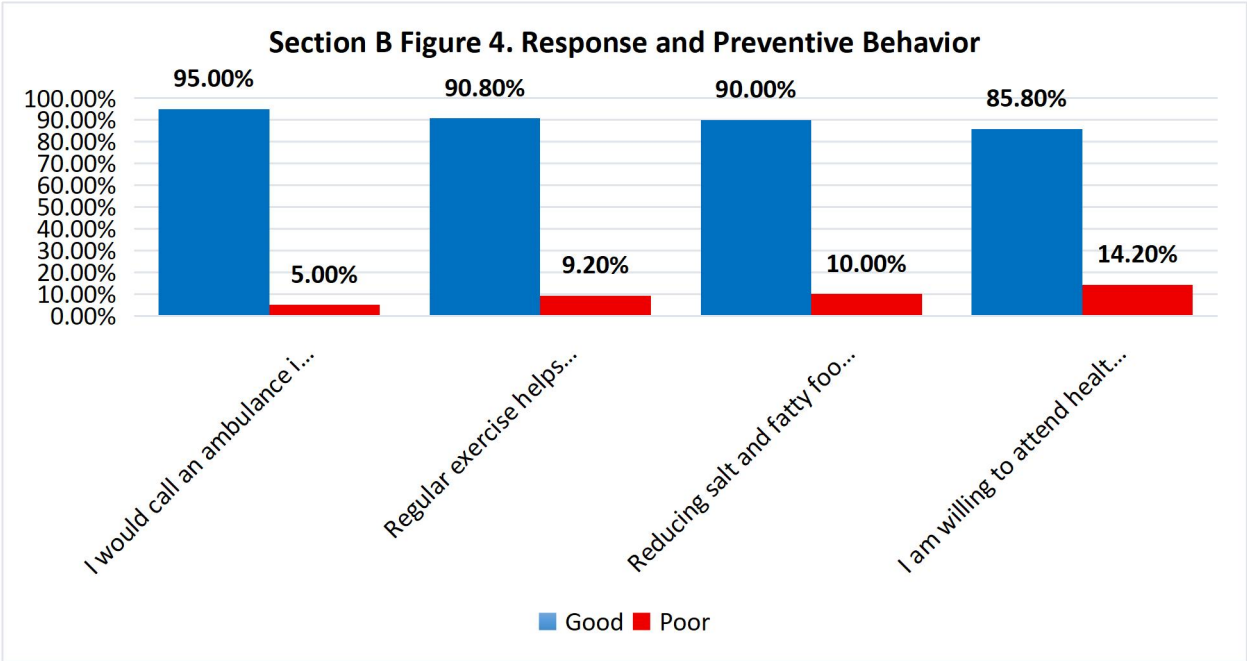


Figure 4 shows what people said about their actions to prevent heart attacks and strokes. Most people 95.0% said they would call for an ambulance if someone had chest pain or their face was drooping, while 5.0% did not respond well. About 90.8% of the people understood that exercising regularly can help prevent heart attacks and strokes, while 9.2% did not know this well. In the same way, 90% of people agreed that eating less salt and fatty foods helps prevent heart disease, while 10% said they didn't agree. Also, 85.8% of people said they were open to going to health education sessions about heart attacks and strokes, while 14.2% did not want to attend.



The association between age and awareness regarding cardiovascular risk factors and warning signs is presented in Table C1. Analysis using the Kruskal–Wallis H test demonstrated a statistically significant difference in awareness scores related to risk factors of heart attack and stroke across different age groups ($p = 0.002$), indicating that awareness varied significantly with age. In contrast, no statistically significant differences were observed across age groups for awareness regarding warning signs of heart attack, warning signs of stroke, or response and preventive behavior, suggesting relatively uniform but suboptimal knowledge in these domains irrespective of age.

Variables	Kruskal-Wallis H-value	df	P-value
Awareness Regarding Risk Factors of Heart Attack and Stroke	12.983	12.983	0.002
Awareness Regarding Warning Signs of Heart Attack	1.448	1.448	0.485
Awareness Regarding Warning Signs of Stroke	0.485	0.485	0.785
Response and Preventive Behavior	1.691	1.691	0.429

Section C Table 1: *Kruskal-Wallis H-test and p-value of awareness regarding risk factor and warning signs of heart attack and stroke with age.*

Table C2 shows the relationship between gender and knowledge about risk factors, warning signs, and how people respond, based on Pearson's chi-square test. A significant link was found between gender and knowledge about heart attack and stroke risk factors ($p = 0.016$). This means that men and women have different levels of awareness about these risks. However, there was no strong connection found between gender and the knowledge of heart attack and stroke warning signs, or how people respond and take preventive measures. This shows that both men and women have gaps in recognizing these signs and knowing what to do.

Variables	Pearson Chi-Square value	df	Significance
Awareness Regarding Risk Factors of Heart Attack and Stroke	20.387	9	0.016
Awareness Regarding Warning Signs of Heart Attack	5.668	5	0.340
Awareness Regarding Warning Signs of Stroke	4.318	6	0.634
Response and Preventive Behavior	5.212	4	0.101

Section C Table 2: Pearson Chi-Square and p-value of awareness regarding risk factor and warning signs of heart attack and stroke with gender

The relationship between education level and awareness domains is shown in Table C3. Pearson's chi-square analysis revealed a statistically significant association between educational status and awareness regarding risk factors of heart attack and stroke ($p = 0.043$), with educated participants demonstrating better awareness compared to illiterate respondents. Conversely, education level did not show a significant association with awareness of warning signs of heart attack, warning signs of stroke, or response and preventive behaviors, indicating that even educated individuals had limited knowledge in these critical areas.

Variables	Pearson Chi-Square value	df	Significance
Awareness Regarding Risk Factors of Heart Attack and Stroke	17.388	9	0.043
Awareness Regarding Warning Signs of Heart Attack	5.419	5	0.367
Awareness Regarding Warning Signs of Stroke	3.000	6	0.809
Response and Preventive Behavior	3.725	4	0.445

Section C Table 3: Pearson Chi-Square and p-value of awareness regarding risk factor and warning signs of heart attack and stroke with education level.

Table C4 presents the association between place of residence and awareness regarding cardiovascular risk factors, warning signs, and preventive responses. No statistically significant association was observed between residency (urban versus rural) and awareness of risk factors, warning signs of heart attack, warning signs of stroke, or response and preventive behavior. This finding suggests that deficiencies in awareness were prevalent across both urban and rural populations.

Variables	Pearson Chi-Square value	df	Significance
Awareness Regarding Risk Factors of Heart Attack and Stroke	15.004	9	0.091
Awareness Regarding Warning Signs of Heart Attack	4.599	5	0.467
Awareness Regarding Warning Signs of Stroke	6.217	6	0.399
Response and Preventive Behavior	6.636	4	0.156

Section C Table 4: Pearson Chi-Square and p-value of awareness regarding risk factor and warning signs of heart attack and stroke with residency.

DISCUSSION

Cardiovascular diseases, including heart attack and stroke, continue to be major cause of morbidity and mortality worldwide, particularly in low income and middle-income countries such as Pakistan, where preventive measures remain limited (1)(2). Early identification of risk factors and warning signs necessary for timely intervention and

improved outcomes (3)(8). The present study assessed public awareness regarding cardiovascular risk factors, warning signs, and response behaviors among adults attending DHQ Hospital, Kohat, and shown important insights into existing knowledge gaps and strengths.

Overall, participants demonstrated moderate to good awareness of common cardiovascular risk factors, such as hypertension, obesity, stress, unhealthy diet, and physical inactivity. Similarly to the study, where traditional and frequently discussed risk factors were better recognized than hereditary or lifestyle related factors such as alcohol consumption (20)(17). Despite this, gap existed, particularly regarding the role of family history and alcohol use, indicating incomplete understanding of comprehensive cardiovascular risk profiles.

Awareness of heart attack warning signs, including chest pain, shortness of breath, palpitations, and radiating pain, was relatively high among respondents. These findings are similar to the previous studies showing better recognition of heart attack symptoms compared to stroke symptoms in general populations (8)(20).

Participants also demonstrated generally good awareness of major stroke warning signs such as, sudden weakness, loss of balance, facial drooping, and dizziness. Nevertheless, recognition of visual disturbances and speech difficulties was comparatively lower, is similar to the findings from other south Asian and low resource setting(21)(22). Lack of significant associations between stroke awareness and sociodemographic variables suggest that gaps in knowledge are widespread rather than confined to specific subgroups.

Regarding response and preventive behaviors, most participants reported appropriate intended actions, such as calling an ambulance in the event of suspected heart attack or stroke. Additionally, a high proportion acknowledged the preventive role of regular exercise and dietary modification. These findings align with the previous studies shown that while attitudes toward prevention may be positive, detailed knowledge and correct emergency response may still be inadequate (17). Evidence from interventional studies suggests that structured community-based education can significantly improve recognition and response to cardiovascular emergencies (21). Statistically significant association were observed between awareness of cardiovascular

risk factors and age, gender, and education level, with better awareness among middle aged and educated participants. This supports existing literature highlighting education as a key determinant of cardiovascular health literacy(7)(23). Contrary to studies reporting urban to rural disparities, this study found no significant differences based on residence, indicating that insufficient awareness is prevalent across both settings.

Overall, the findings showed that there are persistent deficiencies in cardiovascular knowledge despite acceptable awareness of certain risk factors and warning signs.

CONCLUSION

Despite an averagely acceptable public awareness regarding common risk factors and warning signs of heart attack and stroke among adults in DHQ hospital, Kohat significant knowledge gap persist, particularly regarding less recognized risk factors and stroke specific symptoms. These findings emphasize the need for targeted community based cardiovascular health education programs to enhance comprehensive awareness and promote timely health care seeking behavior.

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