Journal of Media Horizons
ISSN: 2710-4060 2710-4052 Volume 7, Issue 6, 2026

ASSESSMENT OF PUBLIC AWARENESS REGARDING RISK FACTORS AND WARNING SIGNS OF HEART ATTACK AND STROKE IN DISTRICT MARDAN

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DOI: https://doi.org/10.5281/zenodo.21192221

Keywords
Heart attack, Stroke, Public awareness, Risk factors, Kruskal-Wallis test, Mann-Whitney U test, Preventive behavior.

Article History
Received: 25 April 2026
Accepted: 04 June 2026
Published: 21 June 2026

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Abstract

Background: *In Pakistan, heart attacks and strokes represent critical public health crises leading to avoidable morbidity and mortality, frequently driven by a lack of public understanding and delayed symptom recognition. This study evaluates adult public awareness regarding cardiovascular risk factors and acute warning indicators within District Mardan.*

Methods: *A descriptive cross-sectional community survey was executed among 167 adults in District Mardan utilizing a structured questionnaire adapted from validated literature. Bivariate associations between demographic factors and awareness levels were calculated using descriptive statistics, Kruskal-Wallis, and Mann-Whitney U tests.*

Results: *Approximately 70% of respondents successfully identified core cardiovascular risk factors, including smoking, hypertension, diabetes, obesity, unhealthy diet, and physical inactivity. Acute warning signs were widely recognized: chest pain (90.4%), abrupt weakness/numbness (89.8%), shortness of breath (86.8%), and dizziness/sweating (86.8%). A statistically significant correlation was observed between risk factor knowledge and age ($p=0.016$). Females demonstrated slightly higher awareness of stroke symptoms ($p=0.041$) and higher preventive activity ($p=0.018$). No significant urban-rural distinctions were detected.*

Conclusion: *Adults in District Mardan exhibit a moderate baseline awareness of heart attacks and strokes, with notable knowledge disparities among younger populations and males. Expanding nursing-led health promotion campaigns can bridge these gaps, lower the regional cardiovascular burden, and foster early care-seeking behaviors.*

1. Introduction

1.1 Background of the Study

Heart attacks and strokes account for approximately 31% of deaths globally, with 85% of these acute events caused by ischemic heart disease and cerebrovascular accidents. Despite advancements in clinical emergency response systems, the burden of cardiovascular diseases (CVDs) continues to grow rapidly in low- and middle-income countries like Pakistan. Pre-hospital delay is a major barrier to successful intervention, as patient outcomes depend significantly on the speed of accessing reperfusion therapies. Research consistently points out that over two-thirds of treatment delays stem directly from a failure to seek medical help immediately. Modifiable risk factors such as smoking, sedentary lifestyles, poor diet, obesity, high blood pressure, diabetes, high cholesterol, and stress heavily drive this escalating crisis.

1.2 Problem Statement & Rationale

In Pakistan, critical symptoms—such as chest discomfort, dyspnea, facial drooping, or slurred speech—are frequently unrecognized or dismissed, leading to life-threatening delays. While the general national burden is documented, localized data regarding community understanding remain scarce. District Mardan encapsulates a highly diverse mix of urban and rural populations with varying degrees of educational attainment and access to health information. This study aims to systematically evaluate public knowledge gaps concerning heart attack and stroke risk factors and warning signs in District Mardan to help guide targeted community health interventions, support nursing-led health literacy campaigns, and reduce avoidable cardiovascular mortality.

2. Methodology

2.1 Study Design and Setting

A descriptive cross-sectional survey was conducted among the adult population of District Mardan, Khyber Pakhtunkhwa, Pakistan. Data collection was carried out across multiple community locations representing both urban and rural cohorts to maximize sample diversity.

2.2 Selection Criteria

Inclusion Criteria: Permanent residency in District Mardan, age ≥20 years, voluntary participation, and capability to provide informed verbal consent.

Exclusion Criteria: Individuals who were severely ill requiring emergency care, individuals presenting cognitive impairments, active healthcare professionals or students (medical/nursing), and individuals with a prior clinical history of heart attack or stroke.

2.3 Sampling and Data Collection Tool

A non-probability convenience sampling technique was utilized. Raosoft software determined a minimum sample size of 167 individuals, assuming a 93% confidence interval and a 7% margin of error. Data were obtained via face-to-face interviews using a structured questionnaire adapted from Pallangyo et al. The tool evaluated four primary domains:

Sociodemographic: Age, gender, education, marital status, occupation, and residency.

CVD Risk Factors: 10 items evaluated on a binary Yes/No scale.

Warning Signs: 5 items for myocardial infarction and 6 items for stroke.

Preventive Intentions: Emergency activation responses and lifestyle behaviors.

2.4 Data Analysis

Statistical analysis was carried out using specialized social science software. Descriptive statistics captured frequencies and percentages. Due to the non-parametric nature of the score distributions, a Kruskal-Wallis test evaluated differences across age cohorts, while Mann-Whitney U tests compared awareness scores across gender and residency groups ($p<0.05$ defined significance).

3. Results

3.1 Demographic Attributes

Of the 167 respondents, 62.3% were female and 37.7% were male. The plurality belonged to the 40–50 age group (38.3%), 82.6% were married, and 76.6% were illiterate. Nearly half (49.1%) reported a family history of heart disease or stroke.

Table 1: Demographic Characteristics of Participants

S. No	Variable	Category	Frequency (%)
1	**Age**	20–29	46 (27.5%)
		30–39	57 (34.1%)
		40–50	64 (38.3%)
2	**Gender**	Male	63 (37.7%)
		Female	104 (62.3%)
3	**Marital Status**	Single	29 (17.4%)
		Married	138 (82.6%)
4	**Education Level**	Illiterate	128 (76.6%)
		Educated	37 (22.2%)
5	**Occupation**	Laborer	67 (40.1%)
		Employee	39 (23.4%)
		Housewife	61 (36.5%)
6	**Residence**	Urban	45 (31.7%)
		Rural	45 (31.7%)

3.2 Awareness of Risk Factors and Warning Signs

Participants demonstrated moderate-to-high baseline awareness across major parameters:

Risk Factors: Excessive stress (92.2%), obesity (86.2%), high fat/salt diets (86.2%), high cholesterol (84.4%), and hypertension (83.2%) were widely identified. Alcohol use (64.1%) and smoking (71.9%) scored lowest.

Heart Attack Symptoms: Chest pain or pressure was identified by 90.4%, palpitations by 87.4%, and shortness of breath alongside dizziness/sweating by 86.8%.

Stroke Symptoms: Loss of balance/coordination led symptom awareness at 91.6%, followed closely by unilateral weakness/numbness (89.8%), severe headache (87.4%), and facial drooping (86.8%).

Table 2: Inferential Hypotheses Testing (Age, Gender, Residence)

Demographic Factor	Awareness Domain	Statistical Test Value	P-value
	Risk Factors	H=8.320 (Kruskal-Wallis)	**0.016***
Age	Heart Attack Signs	H=0.776	0.678
	Stroke Signs	H=0.818	0.664
	Risk Factors	U=2873.5 (Mann-Whitney)	0.172
	Heart Attack Signs	U=3090.5	0.451
Gender	Stroke Signs	U=2719.0	**0.041***
	Preventive Response	U=2738.0	**0.018***
	Risk Factors	U=1722.5 (Mann-Whitney)	0.028
Residence	Heart Attack Signs	U=2024.5	0.247
	Stroke Signs	U=2072.0	0.406

*Significant at $p<0.05$.

4. Discussion

The findings indicate that adults in District Mardan possess intermediate to high baseline awareness regarding major modifiable risk factors and primary clinical presentations of cardiovascular crises. Over 80% of the sample correctly linked hypertension, physical inactivity, high-fat diets, and obesity to elevated risk profiles. This corresponds closely with regional literature, such as community-based surveys in Fayoum Governorate, Egypt, where high recognition of obesity and hypertension was also documented.

However, critical differences appear when looking at broader global contexts. While recent studies in sub-Saharan Africa (e.g., Tanzania) highlighted severe public knowledge gaps where less than half of the public could adequately identify CVD warning signs, the Mardan cohort showed significantly better basic symptom recognition. For instance, chest pain was recognized by 90.4% of our sample, surpassing the 80% baseline reported in similar studies in the United Arab Emirates.

The significant correlation between age and risk factor recognition ($p=0.016$) suggests that life experience or cumulative exposure to healthcare environments increases risk literacy over time. Conversely, the lower awareness among younger adults underscores a critical public health vulnerability. Furthermore, the finding that females possess better stroke symptom recognition ($p=0.041$) and superior preventive behaviors ($p=0.018$) highlights a clear need to target public health messaging toward men, who are often statistically at a higher risk for early-onset cardiovascular events. Given their frequent interactions with patients, community nurses are in an ideal position to bridge these gaps by introducing culturally tailored counseling into routine primary care visits.

5. Conclusion and Recommendations

5.1 Conclusion

This study demonstrates that the adult population of District Mardan has a respectable baseline understanding of cardiovascular risk

factors and acute warning symptoms. However, significant differences persist across demographic groups, with younger adults and males showing lower overall awareness. The absence of significant urban-rural disparities suggests that knowledge access and limitations are uniform across the district's geography.

5.2 Recommendation

1. **Targeted Community Education:** Implement tailored educational campaigns focused on cardiovascular risks, specifically targeting younger adults and male cohorts who demonstrated lower awareness. Broadcast messages via modern and localized media, such as radio, television, and social media networks.
2. **Institutional Curricula Integration:** Introduce basic cardiovascular health literacy, risk modification, and emergency recognition concepts into school and college health programs.
3. **Emergency Preparedness Training:** Establish community workshops focusing on basic life support (CPR) and rapid recognition of stroke and heart attack symptoms to minimize pre-hospital delays.
4. **Future Research:** Future studies should implement randomized probability sampling methods across a broader geographical scope to address the limited generalizability and potential self-reporting biases identified in this convenience-sampled study.

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