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Assessing Prevalence of Cardiovascular Diseases in Female Patients of Karachi, Pakistan

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Abstract

The current study investigated the prevalence of cardiovascular disease (CVD) among young women in Karachi, Pakistan. Utilizing a quantitative cross-sectional design, data was collected from 171 female participants (aged 18–45 years) at The Modern Hospital through convenient sampling. The findings revealed a high prevalence of CVD history (43.9%), with hypertension identified as the most common diagnosis (28.1%). Statistical analysis showed that lower educational level and middle adulthood were significant predictors of CVD history, while marital status and pregnancy did not show significance. Notably, family history emerged as the most potent predictor of disease, alongside clinical markers such as high cholesterol, diabetes, and elevated blood pressure. Interestingly, although 46% of the sample was overweight, BMI did not show a statistically significant correlation with CVD history in this specific cohort. A significant portion of participants (56.1%) reported uncertainty regarding the duration of their health discrepancies, highlighting gaps in early symptom recognition. These results emphasize the urgent need for targeted public health interventions, early screening, and improved health literacy to address the unique risk profiles of young Pakistani women and reduce cardiovascular mortality.

Introduction

Cardiovascular disease (CVD) has become a leading cause of mortality among women all over the world, showing the specific rate of mortality in female is 35% (Vervoort et al., 2024; Vogel et al., 2021; Li et al., 2025). The prevalence is about 6,400 per 100,000, with the mortality rates around 200 per 100,000 (Vervoort et al., 2024; Ashcroft et al., 2025). From 1990–2019 incident CVD cases among women

rose by nearly 74%, largely due to population growth and aging (Mansoor et al., 2025; Li et al., 2025). The prevalence is low in high income countries as compared to low- and middle-income countries—including Pakistan, that face the burden of diseases due to limited healthcare facilities and socioeconomic factors (Vervoort et al., 2024; Mansoor et al., 2025; Li et al., 2025).

In Pakistan, a result of large cross-sectional study shows the equal and higher prevalence of CVD among women (18.3%) as compared to men (16.6%) (Zubair et al., 2018), and urban surveys reported coronary artery disease (CAD) rates as high as 30% among women aged ≥40 years (Jafar et al., 2007). As compared to men, women show high risk factors, such as hypertension, diabetes, obesity, and dyslipidemia (Rauf et al., 2024; Liaquat & Javed, 2018; Uroosh et al., 2024).

Despite this high burden, underdiagnosis and undertreatment remains an issue both globally and within Pakistan (Vervoort et al., 2024; Vogel et al., 2021; Bhatti et al., 2025). There are knowledge gaps in the treatment in women diagnosing cardiovascular risk factors due to atypical symptoms and often take longer to seek care and delays in diagnosing cardiovascular risk factors due to exacerbation of psychosocial restrictions and underestimation of personal risk factors (Vervoort et al., 2024). In low- and middle-income countries (LMICs), ischemic heart disease (IHD) incidence among females increased by over 180% between 1990–2019; IHD now accounts for more than one-eighth of all female deaths (Makuvire et al., 2023). Risk factor is particularly high among South Asian women due to hypertension, diabetes, obesity/central obesity, poor diet quality, low education levels, household air pollution exposure, and physical inactivity (Joseph et al., 2022; Walli-Attaei et al., 2022; Rocha et al., 2023).

The high burden observed among Pakistani women can be attributed to both traditional risk factors and unique sociocultural determinants—such as early marriage/pregnancy-related complications/limited access to care—that are often overlooked by standard risk assessment tools developed primarily for Western populations (Rauf et al., 2024; Rajendran et al., 2023). It has to be determined that there are many young female patients who were misdiagnosed or undiagnosed related to their cardiovascular diseases despite seeking medical consultation (Bhatti et al., 2025). The current research aimed to explore the prevalence of cardiovascular diseases in young female patients in Karachi, Pakistan.

Methods

This quantitative cross-sectional study consisted of 171 female respondents aged from 18 – 45 years old, from The Modern Hospital, Karachi via convenient sampling technique. The survey form included consent form along with the demographic information, history of CVD, and comorbidities. The inclusion criteria consisted of female participants aged 18 years till 45 years, able to provide informed consent, and willing to complete the survey. Both women with and without a history of cardiovascular disease were included. Exclusion criteria consisted of males, females younger than 18 years and above 45 years, individuals unable to give consent, critically ill patients, non-residents, duplicate entries, or those who withdraw consent.

The objective of the study was discussed with them. Respondents were provided with a consent form after they agreed to take part in the study. They were informed about the objective and confidentiality of their personal information. Further, they were informed about their right to withdraw at any time during the study. Once the rapport building was done, demographic sheet followed by the survey form was filled. After collecting the data all respondents were thanked for taking part in the research study. The researcher maintained ethical consideration throughout the duration of the investigation. All respondents were selected with their consent, and confidentiality was maintained throughout the duration of the study. Only those who were willing to participate in the study. Survey was coded according to the self-developed scoring. A

chi-square test was conducted to examine the relationship between history of cardiovascular disease and demographic variables along with the risk factors and comorbidities. Descriptive statistics along was also calculated via Statistical Packa for Social Sciences (SPSS, V-25).

The self-developed survey form consisted of 4 sections stated as follows: Section A consists of socio-demographics factors including age, marital status, education, occupation, and body mass index. Section B discloses the details of diagnoses such as hypertension, ischemic heart disease, or stroke etc. Section C includes risk factors focuses on both significant risks (diabetes and high cholesterol). Section D evaluates the prevalence of symptoms like chest pain, shortness of breath, swelling in legs, palpitations, and fatigue.

Results

Table 1
Demographic Characteristics of Participants in the Study

Demographic Variables	Category	F	%
Age	Early Adulthood	120	70.2%
	Middle Adulthood	51	29.8%
Body Mass Index (BMI)	Underweight	67	39.2%
	Normal Weight	25	14.6%
	Overweight	79	46.0%
Marital Status	Single	37	21.6%
	Married	134	78.4%
Pregnancy	No	124	72.5%
	Yes	47	27.5%
Educational Level	Primary	19	11.1%
	Secondary	49	28.7%
	Graduate	77	45.0%
	Postgraduate	26	15.2%
Occupation	Non-working	13	7.6%
	Working Full Time	42	24.6%
	Working Part Time	14	8.2%
	Housewife	102	59.6%
History of Cardiovascular Disease	No	96	56.1%
	Yes	75	43.9%
History of Hospitalization due to CVD	No	158	92.4%
	Yes	13	7.6%
Family History of CVD	No	94	55.0%
	Yes	77	45.0%

Table 2
Distribution of Cardiovascular Disease Diagnoses and No Diagnosis in the Sample

Diagnosis	F	%
Hypertension	48	28.1
Heart Disease		
Stroke	2	1.2
Arrhythmia	2	1.2
Others	7	4.1
No CVD	16	9.4
	96	56.1

Table 3
Frequency and Percentage of Females with Duration of Discrepancy Awareness

Duration	f	%
Less than 6 months	30	17.5
6 - 12 months	9	5.3
1 - 3 years	36	21.1
Don't Remeber / Not sure	96	56.1

Demographic Predictors of Cardiovascular Disease History

Table 3
Crosstabulation of Age and History of Cardiovascular Disease

Age Group	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
Early Adulthood	61.7%	38.3%	4.99*	.17
Middle Adulthood	43.1%	56.9%		

Note. *p < .05. Φ represents the effect size.

Table 4
Crosstabulation of Marital Status and History of Cardiovascular Disease

Marital Status	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
Single	54.1%	45.9%	.083	.02
Married	56.7%	43.3%		

Note. p < .05. Φ represents the effect size.

Table 5
Crosstabulation of Status of Pregnancy and History of Cardiovascular Disease

Pregnancy Status	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
No	58.1%	41.9%	.678	.06
Yes	51.1%	48.9%		

Note. $p < .05$. Φ represents the effect size.

Table 6
Crosstabulation of Educational Level and History of Cardiovascular Disease

Educational Level	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
Primary	25.3%	73.7%	12.91*	.274
Secondary	46.9%	53.1%		
Graduate	67.5%	32.5%		
Postgraduate	61.5%	38.5%		

Note. *$p < .05$. Φ represents the effect size.

Clinical Symptomology and Hereditary Risk Factors for CVD

Table 7
Crosstabulation of Family History of Cardiovascular Disease and History of Cardiovascular Disease

Family History	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
No	72.3%	27.7%	22.25*	.36
Yes	36.4%	63.6%		

Note. *$p < .01$. Φ represents the effect size.

Table 8
Crosstabulation of Chest Pain and History of Cardiovascular Disease

Chest Pain	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ

Table 7
Crosstabulation of Family History of Cardiovascular Disease and History of Cardiovascular Disease

Family History	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
No	66.1%	33.9%		
			20.05*	.34
Yes	27.3%	72.7%		

Note. *p < .01. Φ represents the effect size.

Table 9
Crosstabulation of Shortness of Breath and History of Cardiovascular Disease

Shortness of Breath	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
No	69.6%	30.4%		
			14.57*	.29
Yes	40.5%	59.5%		

Note. *p < .01. Φ represents the effect size.

Table 10
Crosstabulation of Palpitations and History of Cardiovascular Disease

Palpitations	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
No	69.8%	30.2%		
			21.16*	.35
Yes	33.8%	66.2%		

Note. *p < .01. Φ represents the effect size.

Table 11
Crosstabulation of Swelling in Legs and History of Cardiovascular Disease

Swelling in Legs	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
No	67.2%	32.8%	21.20*	.35

Table 11
Crosstabulation of Swelling in Legs and History of Cardiovascular Disease

Swelling in Legs	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
Yes	28.6%	71.4%		

Note. *p < .01. Φ represents the effect size.

Table 12
Crosstabulation of Fatigue and History of Cardiovascular Disease

Fatigue	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
No	72.7%	27.3%	15.65*	.30
Yes	42.6%	57.4%		

Note. *p < .01. Φ represents the effect size.

Table 13
Crosstabulation of Physical Activity and History of Cardiovascular Disease

Physical Activity	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
No	53.8%	46.2%	.030	.01
Yes	56.3%	43.7%		

Note. p < .05. Φ represents the effect size.

Physiological Markers and Comorbid Conditions in CVD Patients

Table 14
Crosstabulation of Diabetes Mellitus and History of Cardiovascular Disease

Diabetes Mellitus	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
No	59.1%	40.9%	5.47*	.17
Yes	29.4%	70.6%		

Table 14
Crosstabulation of Diabetes Mellitus and History of Cardiovascular Disease

Diabetes Mellitus	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ

Note. *p < .05. Φ represents the effect size.

Table 15
Crosstabulation of Cholesterol and History of Cardiovascular Disease

Cholesterol	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
No	61.7%	38.3%	14.77*	.29
Yes	18.2%	81.8%		

Note. *p < .01. Φ represents the effect size.

Table 6
Crosstabulation of Body Mass Index (BMI) and History of Cardiovascular Disease

BMI	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
Underweight	59.7%	40.3%		
Normal Weight	68%	32%	3.694	.147
Overweight	44.4%	55.6%		

Note. p < .05. Φ represents the effect size.

Table 17
Crosstabulation of Blood Pressure and History of Cardiovascular Disease

Blood Pressure	History of Cardiovascular Disease			
	No	Yes	χ^2	Φ
Low	46.2%	53.8%	11.57*	.260

Table 17
Crosstabulation of Blood Pressure and History of Cardiovascular Disease

Blood Pressure	History of Cardiovascular Disease			
	No	**Yes**	**χ^2**	**Φ**
Normal	60.5%	39.5%		
High	9.1%	90.9%		

Note. *p < .01. Φ represents the effect size.

Discussion

The result of this study shows the demographic characteristics of study participants, all of them were female with the age range of early adulthood (70.2%) and middle adulthood (28.9%) with the high proportion of overweight (46%) followed by underweight (39.2%), shows the high potential of metabolic risks. Most of them are married (78.4%) and housewives (59.6%). The group is well-educated, with 45.0% holding graduate degrees and 15.2% having postgraduate qualifications. Approximately 27.5% of the participants are pregnant.

As far as occupation is concerned 24.6% are working full time, while smaller percentages are non-working (7.6%) and working part time (8.2%). The cardiovascular profile shows that 43.9% are having the history of cardiovascular diseases with only 7.6% have a history of hospitalization. This data also showed the strong genetic predisposition, with 45.0% reporting a family history of CVD and 56.1% of the population shows no history of CVD.

Regarding the specification of cardiovascular disease, hypertension standout among the most common problem 28.1%, followed by arrhythmia (4.1%), heart disease (1.2%), and stroke (1.2%), while 9.4% of the sample reported 'other' cardiovascular-related issues.

The major findings of the study are the duration of discrepancy between their early symptoms and their final diagnosis. Most of the women do not remember about their diagnosis of CVD (56.1%). 21.1% women reported the discrepancy of 1 to 3 years, followed by 17.5% which shows the discrepancy of less than 6 months, however 5.3% reported 6 to 12 months. It can be concluded that delayed or misdiagnosis causes high mortality rate shows the significance of accurate and effective early screening to reduce the mortality rate due to this factor (Johnson et al., 2021).

According to the correlation between sociodemographic factors and history of cardiovascular diseases. The role of educational level in CVD shows that females with higher educational level (e.g. graduate) shows no history of CVD as compared to primary education. The results are confirmed by previous research shows that low educational level is a significant predictor of high CVD (Harris et al., 2025). The result related to age is aligned with the research of Rodgers et al., (2019) confirmed that middle-aged women show history of CVD as compared to early adulthood. Pregnancy and marital status are not significant, thus did not reliably correlate with the presence of cardiovascular disease. There are various risk factors including biological and social factors that are contributing to the misdiagnosis of cardiovascular diseases in young women as depicts in the research of Kaur (2024), shows that early addressing the atypical symptoms, social barriers and early evaluation by clinicians can detect early intervention and reduce mortality.

Further analysis shows the correlation between clinical symptoms and cardiovascular disease. The significance of family history followed by other factors such as, swelling in legs, palpitations, chest pain, fatigue, and shortness of breath. Notably, family history shows the strongest association as compared to other factors. However, physical activity was not found to be significantly associated with CVD status.

Moreover, clinical risk factors were also measured to explore their correlation with CVD, showed Cholesterol, blood pressure, and diabetes mellitus are significantly correlated with CVD. However, BMI was insignificant among them. As supported by the research of Huxley et al., (2015) shows that cardiovascular diseases are the major cause of mortality worldwide due to the number of modifiable risk factors including blood pressure, smoking diabetes, cholesterol, and raised BMI.

The current study shows the significance of genetic factor in CVD and suggested that while middle age and lower educational attainment are significant risk indicators, family history remains the most potent predictor of all. These results highlight a critical need for early screening and metabolic management. Globally, CVD is the leading cause of mortality, in young female patients in Asian population as compared to western population; by emphasizing various risk factors we can overcome social barriers along with early interventions may lead to better disease prevention and reduce mortality.

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