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Public's Knowledge of Heart Failure and its Associated Factors: A Cross-Sectional Study

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Abstract
Heart failure (HF) is a major global health concern, with increasing prevalence in low- and middle-income nations like Pakistan. Understanding the general population's knowledge and awareness of Heart Failure is essential for developing effective prevention and care strategies.
A cross-sectional study was conducted using a standardized questionnaire. The questionnaire covered demographic details, awareness of HF symptoms, risk factors, and preventive strategies. Data were collected from 400 randomly selected participants representing varied socioeconomic backgrounds.
The study revealed that 85% of participants had a basic understanding of heart failure. Awareness of key risk factors, including hypertension, diabetes, and smoking, was also low, with only 46% correctly identifying them. Educational interventions were found to improve awareness levels significantly. There is a

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substantial gap in the knowledge and awareness of heart failure among the general population in District Sialkot. Targeted educational initiatives are urgently required to enhance public understanding of HF symptoms, risk factors, and preventive measures to mitigate the disease's burden.

Keywords: Prevalence, Heart Failure, Knowledge, Awareness

Introduction

Heart failure, a global health challenge, is rising in Pakistan, especially in rural areas like District Sialkot. Despite its significance, public awareness of heart failure symptoms, risk factors, and preventive strategies remains inadequate. This deficiency leads to delayed diagnoses, poor management, and adverse outcomes (Raheel Chaudhry, 2022).

Heart failure (HF) affects approximately one in five people in developed countries, often causing significant distress among patients and their families (Ponikowski et al., 2014). It occurs when the heart cannot pump enough blood to meet the body's needs, leading to symptoms like breathlessness, fatigue, and swollen limbs.

Types of Heart Failure

Systolic vs. Diastolic Heart Failure: Systolic heart failure is marked by reduced left ventricular ejection fraction (HF-REF) due to poor contractility, often caused by coronary artery disease and cardiomyopathies. Diastolic heart failure (HF-PEF) features impaired ventricular relaxation and filling, often linked to hypertension and ischemic heart disease (Schwinger, 2021a).

Right vs. Left Heart Failure

Left-sided heart failure often stems from coronary artery disease and hypertension, while right-sided heart failure is linked to conditions like pulmonary hypertension and COPD (Schwinger, 2021a).

HF with Preserved, Mid-Range, and Reduced Ejection Fraction:

HFpEF occurs with normal or high EF and thickened heart walls, while HFrEF is characterized by a dilated left ventricle and reduced EF (Lainscak et al., 2017).

Acute vs. Chronic Heart Failure

Acute heart failure syndromes (AHFS) have worse short-term outcomes, particularly in ICU patients, whereas chronic heart failure (CHF) is more treatable, with hypertension and coronary disease being primary causes (Firth & Yancy, 1988; Tanai & Frantz, 2016).

Heart failure symptoms are influenced by which side of the heart is affected. Left-sided heart failure leads to pulmonary congestion, causing symptoms like dyspnea, orthopnea, paroxysmal nocturnal dyspnea, and tachypnea. Forward heart failure may result in fatigue and poor nutrient absorption due to reduced blood flow to the extremities and organs. In right-sided heart failure, blood accumulates in veins, leading to peripheral edema, ascites, hepatomegaly, and distended jugular veins, while forward failure causes fatigue, cyanosis, and hypoxia (R D S Watson, 2000).

Pulmonary manifestation**s** occur as fluid leaks into lung tissues, producing crackling sounds. Mild heart failure initially uses lymphatic drainage to manage

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fluid, but over time, this compensatory process fails. **Cardiac symptoms** like dilated cardiomyopathy (DCM) involve heart enlargement and weakening, contributing to cardiac cachexia (Iqbal et al., 2024). **Vascular signs** include jugular vein distention due to increased pressure in the superior vena cava (Bethany Cadman, 2023).

Anemia is common in heart failure patients, often caused by iron deficiency or impaired nutrient absorption, which reduces oxygen transport (Sîrbu et al., 2018). **Extremity symptoms** include cold, pale limbs and peripheral edema (Kataoka, 2013). **Gastrointestinal symptoms** such as anorexia, nausea, and hepatomegaly result from systemic congestion (Schwinger, 2021b). **Cachexia**, characterized by severe muscle and body mass loss, often accompanies heart failure (Krysztofiak et al., 2020). **Cerebral symptoms** include confusion, dizziness, and mood changes, sometimes leading to cardiogenic dementia (Zannad et al., 2009).

Heart failure (HF) is a progressive condition that arises from various causes such as systemic hypertension, aortic stenosis, volume overload, and decreased contractility. Pathophysiological changes include ventricular remodeling, myocyte hypertrophy, and alterations in cardiac structure, leading to both diastolic and systolic dysfunction. The activation of neurohormonal systems, including the sympathetic nervous system (SNS) and the renin-angiotensin-aldosterone system (RAAS), plays a significant role in exacerbating HF symptoms (Sayer & Bhat, 2014). Elevated levels of biomarkers such as BNP and NT-proBNP are commonly used for diagnosing HF (Inamdar & Inamdar, 2016). Risk factors include coronary artery disease, hypertension, diabetes, obesity, and smoking, all of which contribute to the development and worsening of HF (Oh & Cho, 2020; Baena-Díez et al., 2010). Effective early detection and management are crucial to improving patient outcomes, preventing disease progression, and reducing associated morbidity and mortality (Gaggin & Januzzi, 2013).

Alcohol abuse, especially excessive consumption of >90 g per day over five years, is linked to alcoholic cardiomyopathy (ACM), a form of non-ischemic dilated cardiomyopathy. Symptoms like heart failure may develop in chronic users (Laonigro et al., 2009). Age, particularly over 65, and family history also increase heart failure risk, with preventive measures focusing on managing diabetes, blood pressure, and weight (Chamberlain et al., 2020).

Management includes self-care, fluid and salt restriction, exercise, and lifestyle modifications. Non-pharmacological treatment includes education on diet, physical activity, and smoking cessation. Pharmacologically, heart failure treatment relies on diuretics (e.g., furosemide), ACE inhibitors (e.g., enalapril), and beta-blockers to improve symptoms and prognosis (Deniau et al., 2023).

Proper medication and monitoring are vital for elderly patients, particularly those on ACE inhibitors to manage side effects like hypotension and renal issues. Angiotensin II Receptor Blockers (ARBs), such as Losartan and Valsartan, are used to manage heart failure by binding to the AT1 receptor, reducing symptoms like cough common with ACE inhibitors. Side effects of ARBs include dizziness, nausea, and elevated potassium, while rare issues like kidney failure and allergic reactions may occur (Jong et al., 2002). Beta-blockers, once contraindicated, are now first-line treatments, reducing mortality by 30%. Common side effects include fatigue, cold extremities, and depression, with interactions with other drugs like clonidine and verapamil requiring monitoring (Doughty et al., n.d).

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Digoxin, a cardiac glycoside, improves heart function, particularly in patients with atrial fibrillation, but has side effects like nausea and confusion (Campbell, 2003).

In elderly patients, treatment is tailored to manage comorbidities and ensure proper medication use, with emphasis on lifestyle adjustments, exercise, and careful monitoring (Blanck et al., 2002).

Methodology

The study used a descriptive cross-sectional design to assess knowledge and awareness of heart failure among the general population and affected patients in Sialkot, Punjab, Pakistan. The study was conducted in Sialkot, with data collected from both urban and rural areas.

The target population included both male and female participants aged 15-60 years. The sample size was calculated at 384 with a 5% margin of error, and an additional 10% was added to account for non-responses, resulting in 400 participants. Convenience sampling was used, and participants gave verbal consent. The study included individuals who were willing to participate and mentally fit.

A structured questionnaire was developed after a literature review to collect data on demographic characteristics, knowledge, and awareness regarding heart failure. Face-to-face interviews were conducted to gather authentic responses. The validity and reliability of the tool were reviewed by experts, and data analysis was performed using Microsoft Excel, calculating frequency and percentages.

Results

The respondents were categorized by age, with the highest number of participants being in the 26-35 age group (36%) and the lowest in the 15-25 and above 60 categories (10% each). Regarding marital status, the majority were married (54%), while 25% were single, 7% widowed, and 6% divorced.

In terms of education, most respondents had secondary or higher education, with 31% holding a Master's degree and 11% uneducated. Participants came from both urban (46%) and rural (51%) areas.

Table 1: Socio-demographic factors

Sr.no	Questions	Options	Frequency	Percentage (%)
1	Age	15-25	40	10
		26-35	144	36
		36-45	60	15
		46-60	116	29
		Above 60	40	10
2	What is your marital status?	Single	100	25
		Married	216	54
		Divorced	24	6
		Widowed	28	7
3	Education Level	Uneducated	44	11
		Primary	32	8
		Middle	52	13

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		Secondary	24	6
		Higher Secondary	84	21
		Masters	124	31
		Ph. D	28	7
4	Location	Urban	182	46
		Rural	204	51

When asked about prior knowledge of heart failure, 85% of respondents had some awareness, with the main sources being healthcare professionals (55%) and the internet or TV (31%). Additionally, most participants (85%) had witnessed a case of heart failure, predominantly in family members (59%).

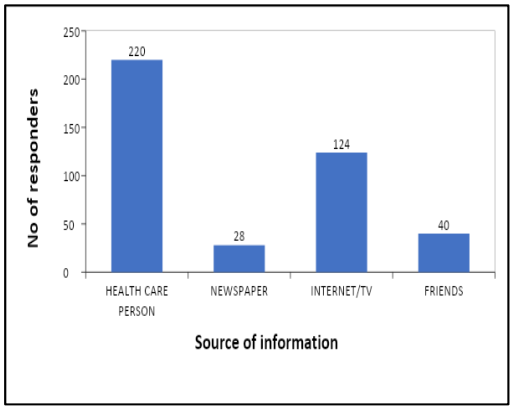

Figure 1: Source of information

The majority (78%) recognized heart failure as a life-threatening condition. Regarding risk factors, high blood pressure, coronary artery disease, and diabetes were the most commonly identified, with 35%, 23%, and 34% of respondents acknowledging these. In terms of lifestyle modifications to avoid heart failure, a healthy diet and exercise were most frequently cited, with 45% and 39% respectively, while 8% mentioned avoiding alcohol and smoking.

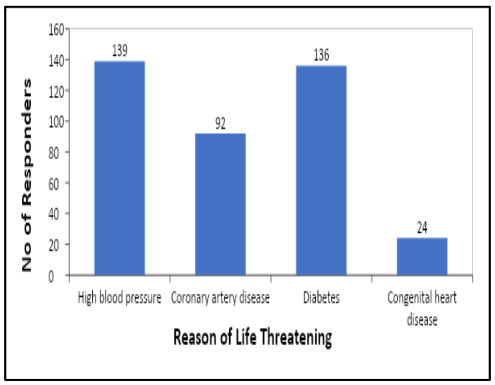

Figure 2: Reason of Life-Threatening

A significant 88% of respondents were aware of heart failure's risk factors, and 25% believed those aged 36-45 were most at risk.

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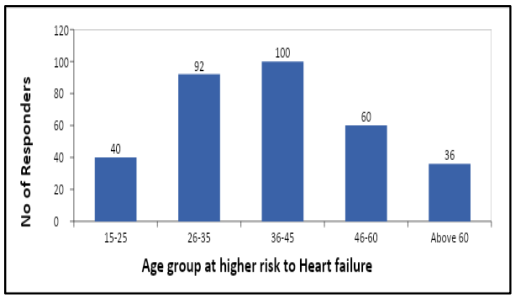

Figure 3: Age Group At Higher Risk

Most respondents (82%) knew the signs and symptoms, such as shortness of breath (53%), with fewer recognizing swelling in legs and ankles (8%). When asked about their overall awareness, 37% rated it as very high, and 12% rated it as very low.

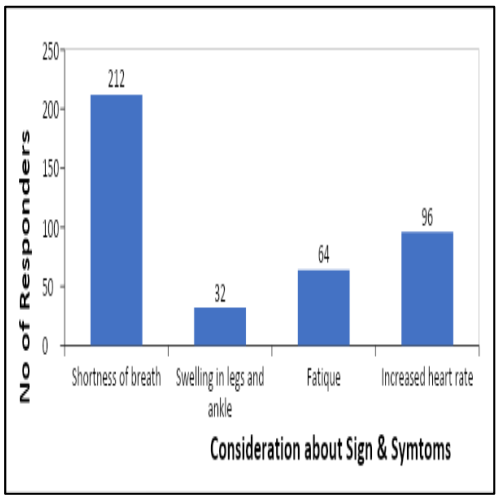

Figure 4: Consideration of signs & symptoms

Regarding diagnostic procedures, 71% of respondents were familiar with the methods used to diagnose heart failure, with ECG being the most recognized (78%).

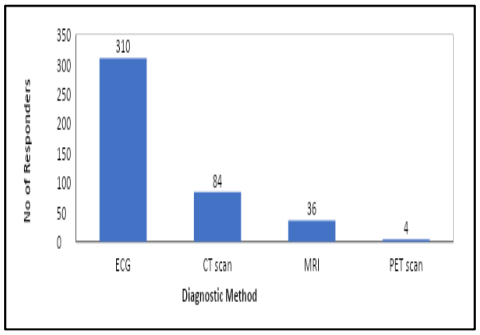

Figure 5: Diagnostic procedure of heart failure

Finally, 83% knew about treatment options for heart failure, and 66% considered surgery to be the most effective treatment, followed by chemotherapy (25%).

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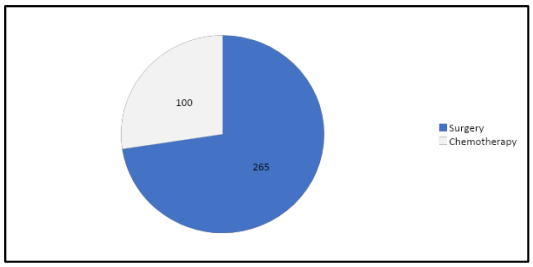

Figure 6: Treatment options of heart failure

Discussion

The study provides insights into the awareness and knowledge of heart failure (HF) among the general population of Sialkot, Punjab, Pakistan. Data was collected from 400 participants, categorized by age, marital status, education, and location. The results showed the following demographics: 36% were aged 26-35, 54% were married, and 31% had a Master's degree. About 46% of participants lived in urban areas, and 51% in rural areas.

Most respondents (85%) were aware of heart failure, with healthcare professionals (55%) being the primary source of information. Additionally, 85% had witnessed heart failure cases, primarily in family members (59%). Most participants (78%) considered heart failure life-threatening, with high blood pressure, coronary artery disease, and diabetes cited as major risk factors.

Regarding knowledge of symptoms, 82% were aware, with shortness of breath being the most recognized symptom (53%). Regarding diagnostics, 71% were knowledgeable, with ECG being the most recognized procedure (78%). For treatment, 83% were aware, with 50% considering surgery as the best option. Lifestyle modifications, such as a healthy diet and exercise, were most commonly suggested by participants affected by heart failure.

Overall, the study indicates a moderate level of awareness about heart failure among the general population, with a strong understanding of risk factors, symptoms, and treatment options.

Conclusion

This study provides valuable insights into the awareness of heart failure in Sialkot, Punjab, Pakistan. It reveals that 85% of respondents are aware of heart failure, primarily through healthcare professionals. However, gaps exist in knowledge about diagnostic procedures (71%) and treatment options (83%). Although 88% know the risk factors, such as smoking, age, and obesity, many do not recognize heart failure as life-threatening. Lifestyle changes and medications are seen as effective treatments, but awareness remains limited. The study emphasizes the need for increased education, especially in rural areas and among those with lower education levels. Strengthening public health campaigns and involving healthcare professionals in disseminating information could improve early diagnosis and treatment, reducing the disease's impact.

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