INTERNATIONAL DEVELOPMENT PLANNING REVIEW
ISSN:1474-6743 | E-ISSN:1478-3401

KNOWLEDGE ABOUT HEART FAILURE KEY INFORMATION AMONG MEDICAL STAFF IN SAUDI ARABIA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: This research aims to determine the Knowledge of Heart Failure Key Information among Medical Staff in Saudi Arabia.

Methods: This study will use a cross-sectional design to assess the knowledge of heart failure information among medical staff in Saudi Arabia. A structured questionnaire will be administered to collect data from participants at various healthcare institutions across the country.

Results: The study included 450 participants. The most frequent gender among them was male (n=256, 56.9%) and female (n=194, 43.1%). The most frequent age among study participants was 36-40 years (n=150, 33.3%), followed by 40 years and more (n=96, 21.3%), then 31-35 years (n=84, 18.7%). The most frequent nationality among study participants was Saudi (n=409, 90.9%), and non-Saudi (n=41, 9.1%). Professional level among study participants, with most of them having consultant (n=95, 21.1%) followed by the general practitioner (n= 88, 19.6%), then health allied professional (n=82, 18.2%), and specialist (n=71, 15.8%), and nurse (n=52, 11.6%), the least resident (n= 46, 10.2%). The most frequent monthly income among study participants was good (n=222, 49.3%), followed by weak (n=134, 29.8%), then high (n=94, 20.9%). Participants were asked about their experience. The most frequent were 6-10 years (n= 220, 48.9%), followed by 5 years or less (n= 133, 29.6%), then more than 10 years (n=97, 21.6%). The marital status among study participants with most of them were married (n=161, 35.8%), followed by single (n=143, 31.8%), then divorced (n=108, 24%), and widow (n=38, 8.4%).

Conclusion: The study demonstrates that medical staff in Saudi Arabia possess a good level of knowledge about heart failure. However, continuous education and training are needed, particularly focusing on early diagnosis and preventive strategies to reduce the disease burden.

INTRODUCTION

A global epidemic, heart failure (HF) is characterized by a high death rate, high morbidity rate, and a poor prognosis [1]. It adds to the worldwide increase in healthcare expenses and impacts 26 million people. Also, treating HF patients incurs huge medical costs, which puts a huge financial strain on people all over the world [2,3]. The prognosis for HF is dismal, much worse than for cancer [6-8], despite the fact that there have been technological and medical advancements that have increased the life expectancy of persons with HF [4,5]. Therefore, in order to improve the prognosis of HF, additional therapy are always required. More public and medical education of HF is necessary for better treatment and preventive efforts. Few research have examined the general population's understanding of HF, despite the severity of the illness. Most of these investigations have shown that public awareness of HF is very restricted [9].

Characteristics such as educational or socioeconomic status and their association with HF knowledge and awareness have been largely ignored and understudied, despite the fact that there have been tremendous developments in HF treatment in recent years [10], including the identification of disease mechanisms. Thus, one component of illness burden management is raising public knowledge of HF. Accurate diagnosis and treatment of heart failure are made possible by early access to medical systems and correct identification of symptoms, severity, and prognosis.

Little is known on the HF understanding of the general people, especially in Europe, since 1990 [11–14]. These results show that the general public had a very poor HF identification rate. Research in nine European nations known as the Study of Heart Failure Awareness and Perception in Europe (SHAPE) in 2005 found that the average person knows very little about HF [13]. While 86% of people were familiar with the term "heart failure," only 3% could correctly identify the condition using a set of symptoms and signs; 31% were able to distinguish between angina and TIA/stroke, and 51% were able to distinguish between the two conditions. The percentage of those who think HF symptoms and signs indicate a "severe" condition is low, at 29% [13]. While 31% of people could identify the signs of angina and 55% of those who had suffered an ischemic stroke could, just 3% could do the same for heart failure. Similarly, studies done in Europe in the 2010s found that HF awareness had not increased much either [11,14].

Healthcare expenditures are skyrocketing because to the ever-increasing frequency of HF in Asia. Unfortunately, there was a dearth of research that looked at how well the general public understood HF. People in Korea still don't know much about HF, according to a recent research [15]. Specifically, whereas 80% of people were familiar with the term HF, only 47% could provide a detailed description of what it is. The lifetime risk of developing HF (21%), its associated mortality (16%), readmission risk (18%), and economic cost (28%) were all accurately recognized by a minority of participants [15]. Many people severely underestimated the likelihood of heart failure due to incorrectly identifying symptoms. The proper physical activities for heart failure patients were misinterpreted by almost 50% of the participants [15]. A prior research of the elderly population found that almost 70% of the participants had the wrong understanding of the phrase "heart failure." Not only that, but more than 90% of those who took part in the survey wanted greater information and education on heart failure for both patients and caregivers [16]. Despite the fact that 99% of the general population had heard of HF, only 6% of those who participated in

a research that examined public knowledge of HF in 13 countries correctly recognized exhaustion, shortness of breath, and swelling of the legs as the key symptoms of HF [17].

The economic toll of chronic heart failure is often ignored in developing countries, even though it is very common in the Middle East [18]. Approximately 320,000 people in Saudi Arabia (SA) are receiving heart failure treatment out of an estimated 1.35 million across the Middle East. All things considered, including medical care and potential consequences, the sickness was estimated to have cost $1.92 billion. Annual expenses per patient were greatest in the UAE, next in South Africa, and finally in Egypt [19]. There is a dearth of research in the Middle East that evaluates cardiac awareness and understanding, and even less that specifically examines HF. Improving cardiovascular (CV)-related health outcomes is dependent on providing Emirati women, who are the target demographic for the survey, with accurate information on the prevalence and severity of heart disease in the UAE [20]. The study's success hinged on participants' ability to recognize the signs and symptoms of heart disease based on their age and gender. Reduced morbidity and mortality from heart disease among native females of the UAE should be achieved by addressing the potentially modifiable obstacles to healthcare procurement that were found in the research.

The majority of people(55%) did not understand what heart failure was, and a sizable percentage(67%) erred in identifying diabetes, hypertension, and coronary heart disease as major risk factors for HF [19]. Management of hypertension and dyslipidemia is subpar in the MENA region, even though risk factors are prevalent there. Seventy percent of low-income individuals had dyslipidemia, but only four percent of them were given medication to decrease their cholesterol levels [20,21].

The differences in how severe and perceived HF is may eventually make therapy more difficult and worsen the prognoses for people with HF [22]. Therefore, in order to raise HF awareness, it is crucial to determine what factors contribute to it. There would be a dramatic drop in HF progression, readmission rates, and early death if risk variables were controlled. Therefore, this research set out to determine the level of HF knowledge of key information among Saudi medical staff and the factors that predicted it.

METHODS

Study design

This study will use a cross-sectional design to assess the knowledge of heart failure key information among medical staff in Saudi Arabia. A structured questionnaire will be administered to collect data from participants at various healthcare institutions across the country.

Study approach

The study will be conducted in multiple healthcare settings, including public and private hospitals, primary care centers, and specialized cardiac centers across different regions of Saudi Arabia. The diverse settings will ensure a comprehensive representation of medical staff involved in heart failure management.

Study population

The study population will consist of medical professionals, including physicians, nurses, and allied health professionals, working in Saudi Arabia. Participants must be involved in the diagnosis, management, or care of heart failure patients.

Study sample

A stratified random sampling technique will be employed to ensure representation from various healthcare professions and settings. A sample size of approximately 300 participants will be

targeted, based on the expected population size and variability, with adjustments made to ensure statistical power and accuracy.

Study tool

For the current study, the questionnaire was adopted for data collection, which was also categorized as a study tool.

Data collection

Data will be collected using a structured self-administered questionnaire distributed to participants either in person or electronically. The questionnaire will include sections on demographics, knowledge of heart failure symptoms, risk factors, diagnostic criteria, treatment protocols, and patient education.

Data analysis

Descriptive statistics will be used to summarize demographic data and overall knowledge scores. Inferential statistics, including chi-square tests and ANOVA, will compare knowledge levels across different healthcare professions, regions, and years of experience. Multivariate regression analysis will be conducted to identify predictors of high or low knowledge levels.

Ethical considerations

Ethical approval will be obtained from an institutional review board (IRB) before the commencement of the study. All participants will provide informed consent, and the confidentiality of responses will be maintained. Participation will be voluntary, and no personal identifiers will be used in data analysis or reporting.

RESULTS

The study included 450 participants. The most frequent gender among them was male (n=256, 56.9%) and female (n=194, 43.1%). Figure 1 shows the gender distribution among study participants. The most frequent age among study participants was 36-40 years (n=150, 33.3%), followed by 40 years and more (n=96, 21.3%), then 31-35 years (n=84, 18.7%). Figure 2 shows the age distribution among study participants. The most frequent nationality among study participants was Saudi (n=409, 90.9%) and non-Saudi (n=41, 9.1%). Figure 3 shows the distribution of nationality among study participants.

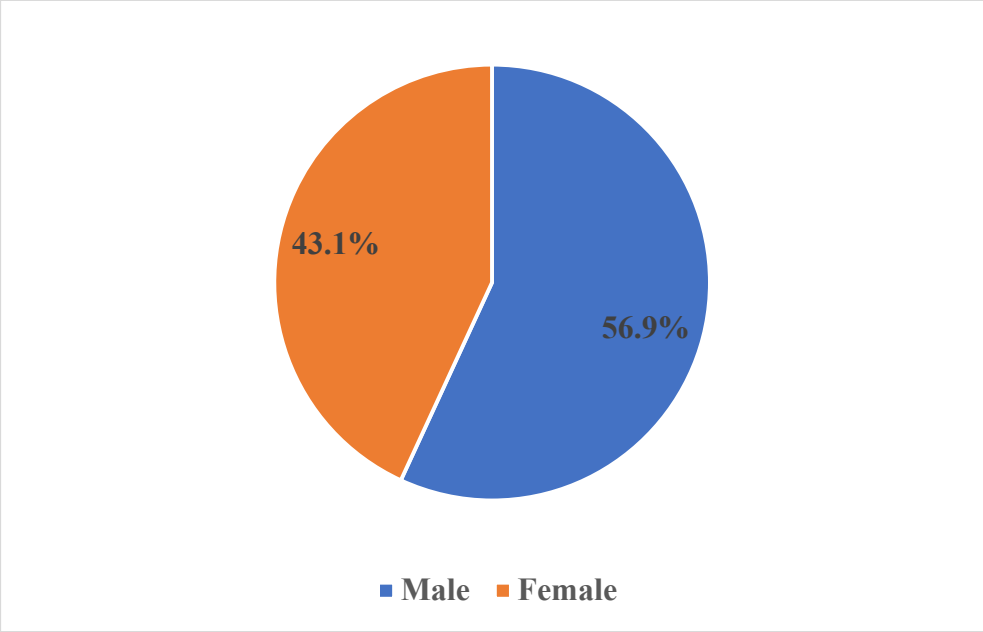

Figure 1: Gender distribution among study participants

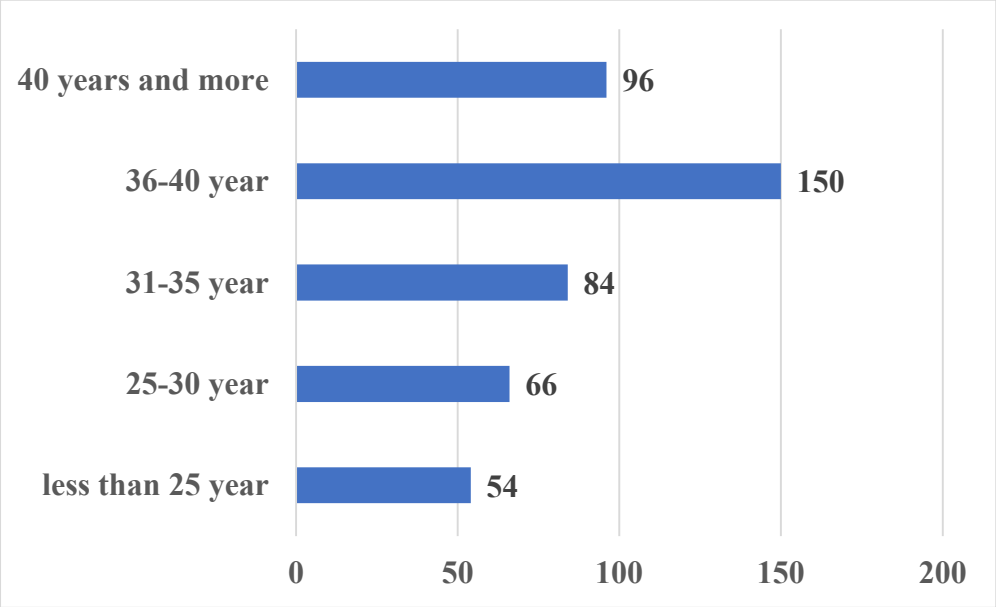

Figure 2: Age distribution among study participants

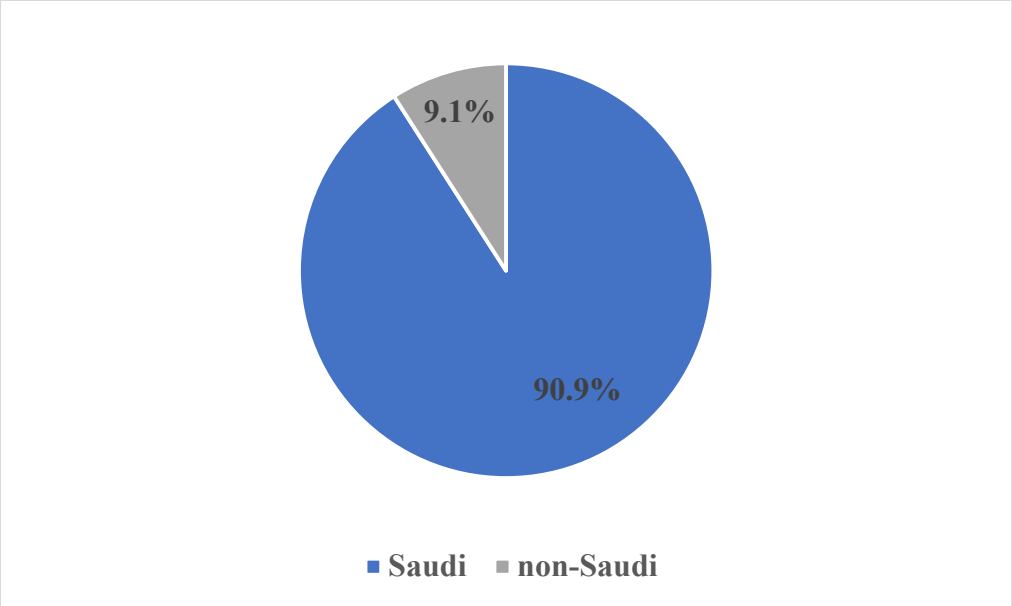

Figure 3: Nationality distribution among study participants

Professional level among study participants, with most of them having consultant (n=95, 21.1%) followed by the general practitioner (n= 88, 19.6%), then health allied professional (n=82, 18.2%), and specialist (n=71, 15.8%), and nurse (n=52, 11.6%), the least resident (n= 46, 10.2%).

The marital status among study participants with most of them were married (n=161, 35.8%), followed by single (n=143, 31.8%), then divorced (n=108, 24%), and widow (n=38, 8.4%). Marital status is presented in Figure 4.

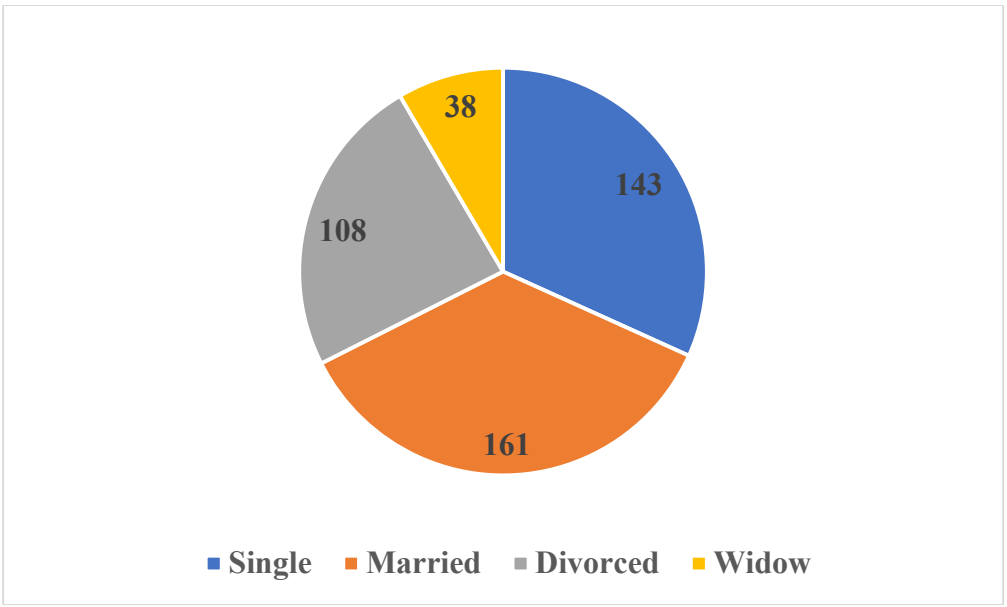

Figure 4: Marital status distribution among study participants

The most frequent monthly income among study participants was good (n=222, 49.3%), followed by weak (n=134, 29.8%), then high (n=94, 20.9%). Figure 5 shows the monthly income distribution among study participants.

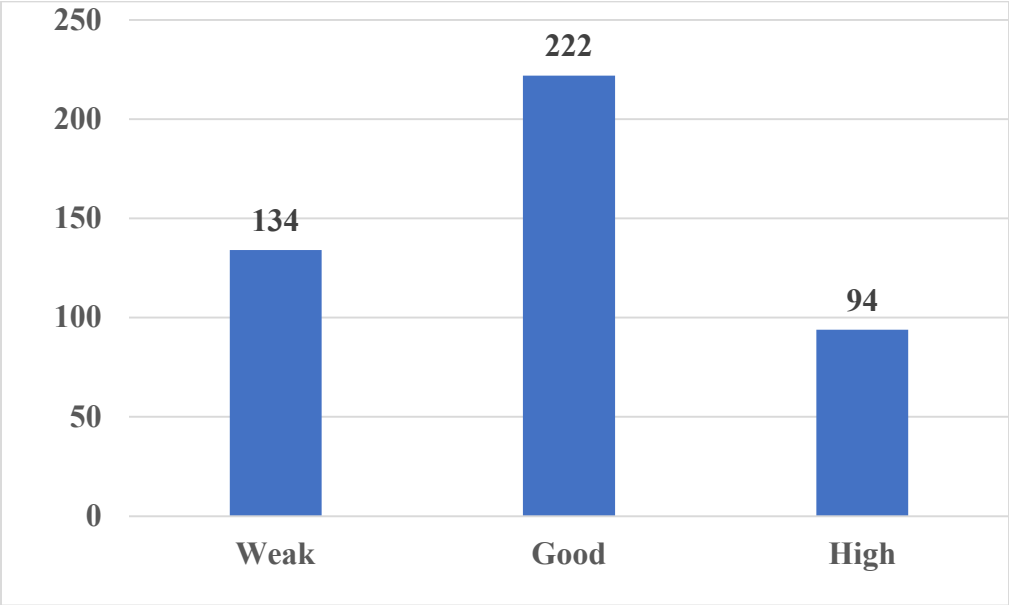

Figure 5: Monthly income distribution among study participants

Participants were asked about knowledge about heart failure keys. Their responses and results are presented in Table 1.

Table 1: Knowledge about Heart Failure Key Information

Item	Agree	Not sure	Disagree
Heart failure is the inability of the heart to pump enough blood to meet the body's needs.	440 (97.8%)	8 (1.8%)	2 (0.4%)
Hypertension, diabetes, and coronary artery disease are common causes of heart failure.	436 (96.9%)	12 (2.7%)	2 (0.4%)
Obesity, smoking, and a sedentary lifestyle increase the risk of developing heart failure.	438 (97.3%)	8 (1.8%)	4 (0.9%)
Left ventricular dysfunction is a primary mechanism involved in heart failure.	433 (96.2%)	10 (2.2%)	7 (1.6%)
Heart failure can be classified into systolic heart failure and diastolic heart failure.	434 (96.4%)	10 (2.2%)	6 (1.3%)

Shortness of breath is a common symptom of heart failure.	432 (96%)	14 (3.1%)	4 (0.9%)
An echocardiogram is an essential tool for diagnosing heart failure.	427 (94.9%)	17 (3.8%)	6 (1.3%)
Edema and elevated heart rate are typical clinical findings in heart failure.	425 (94.4%)	15 (3.3%)	10 (2.2%)
BNP (B-type natriuretic peptide) is often elevated in patients with heart failure.	430 (95.6%)	12 (2.7%)	8 (1.8%)
ACE inhibitors, beta-blockers, and diuretics are commonly prescribed for heart failure management.	426 (94.7%)	16 (3.6%)	8 (1.8%)
Low-sodium diet, smoking cessation, and increased physical activity are recommended lifestyle changes for heart failure patients.	440 (97.8%)	6 (1.3%)	4 (0.9%)
Implantable cardioverter defibrillators (ICD) and pacemakers are used in the management of severe heart failure.	430 (95.6%)	12 (2.7%)	8 (1.8%)
The average 5-year survival rate for heart failure patients is approximately 50%.	436 (96.9%)	8 (1.8%)	6 (1.3%)
Controlling blood pressure and maintaining a healthy weight are important preventive measures for heart failure.	433 (96.2%)	10 (2.2%)	7 (1.6%)
Kidney failure, stroke, and arrhythmias are common complications of heart failure.	428 (95.1%)	13 (2.9%)	9 (2%)

Participants were asked about their experience. The most frequent were 6-10 years (n= 220, 48.9%), followed by 5 years or less (n= 133, 29.6%), then more than 10 years (n=97, 21.6%). Figure 6 shows the experience of participants.

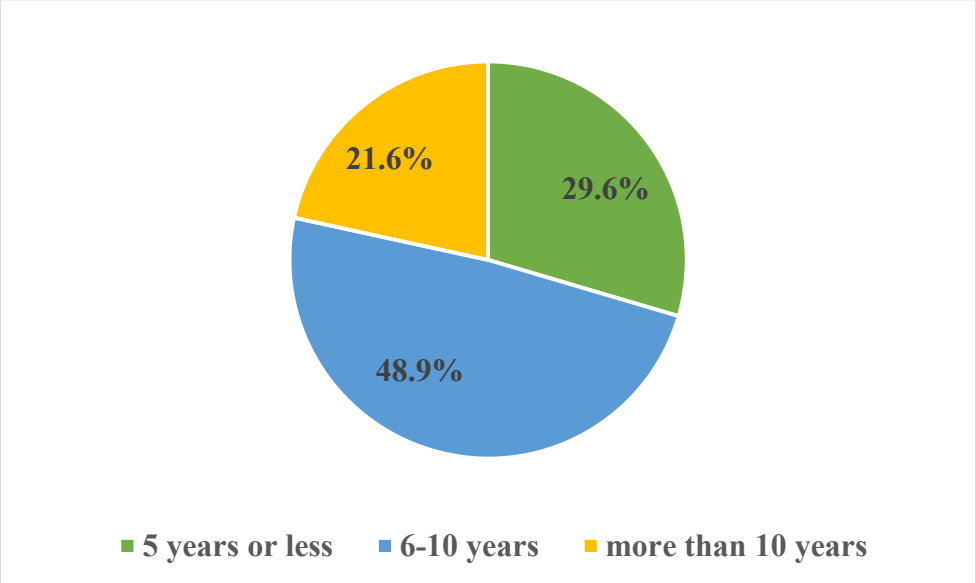

Figure 6: experience distribution among study participants

DISCUSSION

A complicated clinical illness that develops from any anatomical or functional impairment of ventricular filling or ejection of blood is heart failure (HF), according to the American College of Cardiology (ACC) and the American Heart Association (AHA). Both global mortality and CHF are mostly caused by ischemic heart disease. CHF is a prevalent disease that causes a lot of suffering and death all over the globe. Heart failure (CHF) affects an estimated 26 million individuals globally, which raises healthcare expenses, decreases functional ability, and has a major impact on quality of life. In order to improve patient outcomes, reduce morbidity and mortality, and avoid unnecessary hospitalizations, it is critical to identify the condition and treat it properly [21].

Heart failure (HF) has a far-ranging and diverse set of causes. No matter what the underlying reason may be, the overarching goal of treatment is to alleviate systemic and pulmonary congestion while stabilizing hemodynamic state. A multipronged strategy including patient education, effective medicine delivery, and reduction of acute exacerbations is necessary for the management of HF.

Left ventricle ejection fraction (LV EF) is used to classify HF [21].

- HF with reduced ejection fraction (HFrEF): LV EF ≤ 40%
- HF with mildly reduced ejection fraction: LV EF 41% - 49% and evidence of HF (elevated cardiac biomarkers or elevated filling pressures)
- HF with preserved ejection fraction (HFpEF): LV EF ≥ 50% and evidence of HF (elevated cardiac biomarkers or elevated filling pressures)
- HF with improved ejection fraction: LV EF >40%, with previously documented LV EF ≤ 40%

Patients with HFpEF make up 44% to 72% of all instances of CHF, yet they have historically been underdiagnosed. Echocardiography shows left ventricular ejection fraction (EF) equal to or more than 50% and signs of diminished diastolic function. Older age, being female, and diabetes are additional risk factors, with hypertension (HTN) being the most important [22]. Jointly, the ACC and the AHA divide HF into four phases, the first two of which are characterized by a lack of symptoms and the second two by the intensity of those symptoms.

ACC/AHA Heart Failure Stages

- Stage A: At risk for HF. No symptoms, structural heart disease, or evidence of elevated cardiac biomarkers, but risk factors are present. Risk factors include hypertension, diabetes, metabolic syndrome, cardiotoxic medications, or having a genetic variant for cardiomyopathy.
- Stage B: Pre-HF. Patients have no signs or symptoms of HF but have structural heart disease, evidence of elevated filling pressures (by invasive or noninvasive assessment), or persistently elevated cardiomarkers in the absence of other reasons for elevated markers, like chronic kidney disease or myocarditis.
- Stage C: Patients with structural heart disease and current or past history of HF symptoms.
- Stage D: Patients with refractory symptoms that interfere with daily life or recurrent hospitalization despite targeted guideline-directed medical therapy.

The New York Heart Association Functional Classification is used for patients with symptoms of HF. This system is subjectively determined by clinicians and is widely used in clinical practice to direct therapy.

CONCLUSION

The study demonstrates that medical staff in Saudi Arabia have good knowledge about heart failure. However, continuous education and training are needed, mainly focusing on early diagnosis and preventive strategies to reduce the disease burden.

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ANNEX 1: DATA COLLECTION TOOL

Age (years)			**Gender**		Male		Female
Marital Status	Single		Married		Divorced		Widow
Professional level	General Practitioner		Resident		Specialist		Consultant
Others	Nurse		Health Allied Professional				
Monthly income	Weak		Good		High		
Experience	=<5 years		6-10 years		>10 years		
Nationality	Saudi	Non-Saudi	**Working hours per week**				

Knowledge about Heart Failure Key Information

Item	Agree	Not sure	Disagree
Heart failure is the inability of the heart to pump enough blood to meet the body's needs.			
Hypertension, diabetes, and coronary artery disease are common causes of heart failure.			
Obesity, smoking, and a sedentary lifestyle increase the risk of developing heart failure.			
Left ventricular dysfunction is a primary mechanism involved in heart failure.			
Heart failure can be classified into systolic heart failure and diastolic heart failure.			
Shortness of breath is a common symptom of heart failure.			
An echocardiogram is an essential tool for diagnosing heart failure.			
Edema and elevated heart rate are typical clinical findings in heart failure.			
BNP (B-type natriuretic peptide) is often elevated in patients with heart failure.			
ACE inhibitors, beta-blockers, and diuretics are commonly prescribed for heart failure management.			
Low-sodium diet, smoking cessation, and increased physical activity are recommended lifestyle changes for heart failure patients.			
Implantable cardioverter defibrillators (ICD) and pacemakers are used in the management of severe heart failure.			
The average 5-year survival rate for heart failure patients is approximately 50%.			

Controlling blood pressure and maintaining a healthy weight are important preventive measures for heart failure.			
Kidney failure, stroke, and arrhythmias are common complications of heart failure.			

APPENDIX 2: Participants responses to scale items

gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	256	56.9	56.9	56.9
	Female	194	43.1	43.1	100.0
	Total	450	100.0	100.0	

age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 25 year	54	12.0	12.0	12.0
	25-30 year	66	14.7	14.7	26.7
	31-35 year	84	18.7	18.7	45.3
	36-40 year	150	33.3	33.3	78.7
	40 years and more	96	21.3	21.3	100.0
	Total	450	100.0	100.0	

Nationality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Saudi	409	90.9	90.9	90.9
	non-Saudi	41	9.1	9.1	100.0
	Total	450	100.0	100.0	

Marital status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	143	31.8	31.8	31.8
	Married	161	35.8	35.8	67.6
	Divorced	108	24.0	24.0	91.6
	Widow	38	8.4	8.4	100.0
	Total	450	100.0	100.0	

Monthly income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Weak	134	29.8	29.8	29.8
	Good	222	49.3	49.3	79.1
	High	94	20.9	20.9	100.0
	Total	450	100.0	100.0	

Professional level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	General Practitioner	88	19.6	19.6	19.6
	Resident	46	10.2	10.2	29.8
	Specialist	71	15.8	15.8	45.6
	Consultant	95	21.1	21.1	66.7
	Nurse	52	11.6	11.6	78.2
	Health Allied Professional	82	18.2	18.2	96.4
	others	16	3.6	3.6	100.0
	Total	450	100.0	100.0	

Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 years or less	133	29.6	29.6	29.6
	6-10 years	220	48.9	48.9	78.4
	more than 10 years	97	21.6	21.6	100.0
	Total	450	100.0	100.0	

Knowledge about Heart Failure Key Information

Item	Agree	Not sure	Disagree
Heart failure is the inability of the heart to pump enough blood to meet the body's needs.	440 (97.8%)	8 (1.8%)	2 (0.4%)
Hypertension, diabetes, and coronary artery disease are common causes of heart failure.	436 (96.9%)	12 (2.7%)	2 (0.4%)
Obesity, smoking, and a sedentary lifestyle increase the risk of developing heart failure.	438 (97.3%)	8 (1.8%)	4 (0.9%)
Left ventricular dysfunction is a primary mechanism involved in heart failure.	433 (96.2%)	10 (2.2%)	7 (1.6%)
Heart failure can be classified into systolic heart failure and diastolic heart failure.	434 (96.4%)	10 (2.2%)	6 (1.3%)
Shortness of breath is a common symptom of heart failure.	432 (96%)	14 (3.1%)	4 (0.9%)
An echocardiogram is an essential tool for diagnosing heart failure.	427 (94.9%)	17 (3.8%)	6 (1.3%)
Edema and elevated heart rate are typical clinical findings in heart failure.	425 (94.4%)	15 (3.3%)	10 (2.2%)
BNP (B-type natriuretic peptide) is often elevated in patients with heart failure.	430 (95.6%)	12 (2.7%)	8 (1.8%)
ACE inhibitors, beta-blockers, and diuretics are commonly prescribed for heart failure management.	426 (94.7%)	16 (3.6%)	8 (1.8%)
Low-sodium diet, smoking cessation, and increased physical activity are recommended lifestyle changes for heart failure patients.	440 (97.8%)	6 (1.3%)	4 (0.9%)
Implantable cardioverter defibrillators (ICD) and pacemakers are used in the management of severe heart failure.	430 (95.6%)	12 (2.7%)	8 (1.8%)
The average 5-year survival rate for heart failure patients is approximately 50%.	436 (96.9%)	8 (1.8%)	6 (1.3%)
Controlling blood pressure and maintaining a healthy weight are important preventive measures for heart failure.	433 (96.2%)	10 (2.2%)	7 (1.6%)
Kidney failure, stroke, and arrhythmias are common complications of heart failure.	428 (95.1%)	13 (2.9%)	9 (2%)