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Public Knowledge and Attitudes Toward Takotsubo Cardiomyopathy in Al-Ahsa, Saudi Arabia

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Abstract

Introduction: Public understanding of Takotsubo cardiomyopathy may inform community education priorities. This study assessed knowledge and attitudes toward the condition and their associations with sociodemographic characteristics among adults in Al-Ahsa, Saudi Arabia.

Methodology: A community-based cross-sectional study included 463 adult residents recruited through convenience sampling with an electronic questionnaire in September 2026. Knowledge and attitude scores were summarized descriptively. Independent-samples t tests and one-way analysis of variance assessed demographic differences, with Tukey's post hoc tests for pairwise comparisons, and multivariable linear regression identified independent associations.

Results: The mean knowledge score was 5.93 ± 4.74 out of 16, representing 37.07% of the maximum score, while the mean attitude score was 3.71 ± 0.65 out of 5. Knowledge was greatest regarding emotional stress as a trigger, with gaps concerning coronary obstruction and triggers beyond negative emotions. Willingness to contact emergency medical services received the highest attitude rating. In unadjusted comparisons, knowledge differed by marital status ($p = 0.003$) and employment status ($p = 0.044$), with higher scores among married participants than single participants and among homemakers than students, and attitudes differed by marital status ($p = 0.004$). None of these associations remained after multivariable adjustment, and neither score differed significantly by age, sex, education, or household income.

Conclusion: Knowledge was limited, although reported attitudes toward seeking care were generally favorable. Because no sociodemographic characteristic was clearly associated with either score after adjustment, community education should address the general public, correct misconceptions, and reinforce appropriate responses to acute cardiac symptoms. Further research should assess whether improved knowledge translates into timely help seeking.

Keywords: Takotsubo cardiomyopathy; Public knowledge; Health attitudes; Cross-sectional study; Al-Ahsa; Saudi Arabia.

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Introduction

Takotsubo syndrome (TTS), or Takotsubo cardiomyopathy, is an acute neurocardiac disorder characterized by transient ventricular systolic dysfunction without an acute culprit coronary obstruction. It commonly presents as apical ballooning but may involve other ventricular patterns. Emotional, physical, or neurological stress may trigger TTS, although no trigger is required. Sympathetic hyperactivation, catecholamine excess, microvascular dysfunction, and brain–heart axis dysregulation are proposed mechanisms [1,2].

TTS predominantly affects older women; 89.8% of patients in the International Takotsubo Registry were women [3]. Its global burden is uncertain because of underdiagnosis and misclassification as acute coronary syndrome (ACS). TTS is estimated to occur in 15–30 people per 100,000 annually and accounts for approximately 1–2% of suspected ACS presentations [4]. Hospital-based data have reported TTS in approximately 0.02% of United States hospitalizations in 2008 [5]. However, increasing incidence in both sexes [6] and greater recognition among men, patients with physical triggers, and patients with non-apical variants have been reported [7].

Saudi epidemiological data remain unavailable, with published evidence limited largely to case reports [8,9]. Although ventricular function frequently recovers, TTS can cause heart failure, cardiogenic shock, arrhythmias, stroke, cardiac arrest, and death [10], as well as systemic thromboembolism [4] and recurrence [11]. Because its presentation resembles ACS, urgent evaluation with electrocardiography, cardiac biomarkers, echocardiography, and coronary imaging is required. Management is supportive and individualized according to hemodynamic status and complications [12,13]. No medication has been shown in randomized trials to prevent recurrence or improve long-term survival; observational data show no reduction in recurrence with beta-blockers, angiotensin-converting enzyme inhibitors or angiotensin receptor blockers, or their combination [11], although beta-blockers have been associated with lower all-cause mortality [14].

In a 2025 Syrian cross-sectional preprint, only 55% of 121 participants had heard of TTS [15]. No TTS-specific data are available for Saudi Arabia. A national online survey found moderate knowledge of cardiovascular diseases, with gaps in recognizing warning symptoms [16], and in an Al-Ahsa study, awareness of heart attacks was high, but many respondents did not know the ambulance number or how to respond in an emergency [17]. This study assessed knowledge of, attitudes toward, and intended emergency responses to Takotsubo cardiomyopathy among adults in Al-Ahsa, Saudi Arabia, and their associations with sociodemographic factors.

Methods

Study design and setting

A community-based analytical cross-sectional study was conducted among adult residents of Al-Ahsa Governorate in the Eastern Province of Saudi Arabia between 14 and 22 September 2026. Al-Ahsa includes the major urban centers of Al-Hofuf and Al-Mubarraz, as well as surrounding towns and villages. The study assessed factual knowledge, attitudes, and intended responses concerning Takotsubo syndrome (TTS).

Target population and eligibility

The target population comprised community-dwelling adults residing in Al-Ahsa. Individuals were eligible if they were aged 18 years or older, had resided in Al-Ahsa for at least six months, could read Arabic, and provided electronic informed consent. Visitors, individuals younger than 18 years, and those unable to provide informed consent were excluded. Duplicate submissions and incomplete questionnaires were also excluded.

Sample-size calculation

Because no reliable Saudi population estimate of TTS-specific public knowledge was identified, a conservative expected proportion of 50% was used. Assuming a 95% confidence level, 5% absolute precision, and a large source population, the single-proportion formula, $n = Z^2p(1 - p)/d^2$, yielded 384.16 participants. Allowing for approximately 10% incomplete or unusable responses increased the minimum recruitment target to 427 participants (384.16/0.90 = 426.84, rounded up). The final analysis included 463 participants.

Sampling technique and questionnaire administration

A convenience sampling technique was used to recruit eligible adults residing in Al-Ahsa. The electronic questionnaire was administered through Google Forms and distributed through community channels and social media platforms, including WhatsApp, Telegram, X, and Snapchat, with QR codes providing access to the survey. Responses came through 11 data collectors, and each response recorded the number of the collector who shared the link. The form opened with information about the study, followed by a mandatory question asking whether the participant agreed to take part; only those who answered “yes” could continue to the study questions.

Questionnaire structure and scoring

The questionnaire comprised six sociodemographic items, 16 knowledge items, and six attitude items (Tables 2 and 3). Knowledge items offered the responses “true”, “false”, and “I don’t know”. A correct response scored 1, and an incorrect or “I don’t know” response scored 0; “false” was the correct response for the six false statements (items 2, 6, 8, 10, 11, and 14). Total knowledge scores therefore ranged from 0 to 16 and are also reported as a percentage of the maximum possible score. Attitude items were rated on a five-point Likert scale from “strongly disagree” (1) to “strongly agree” (5). The three negatively worded items (4–6) were reverse-scored, and the attitude score was the mean of the six items, so higher scores indicate more favorable attitudes. The questionnaire was administered in Arabic; the Arabic version and an English translation are provided as supplementary files.

Validity of the questionnaire

The questionnaire underwent a multistep validation process. Content validity was assessed by three multidisciplinary experts. Face validity and response-process evidence were evaluated through cognitive interviews with 15 adults from diverse backgrounds in Al-Ahsa. The revised Arabic questionnaire was

then pilot-tested among 40 eligible residents, who were excluded from the final study sample, to assess its feasibility and item performance. In the study sample, Cronbach's alpha was 0.90 for the knowledge scale and 0.69 for the attitude scale. The knowledge value fell to 0.83 when the 105 participants who answered "I don't know" to every item were excluded, and the attitude value was just below the conventional 0.70 threshold.

Statistical analysis

Data were analyzed using IBM SPSS Statistics, version 32.0 (IBM Corp., Armonk, NY, USA). Categorical variables were summarized as frequencies and percentages, while knowledge and attitude scores were presented as means and standard deviations. Descriptive statistics were calculated for individual questionnaire items and overall scores. Independent-samples t tests were used to compare mean knowledge and attitude scores between male and female participants, with Welch's correction when Levene's test showed unequal variances. One-way analysis of variance (ANOVA) was used to compare scores across categories of age, marital status, educational attainment, employment status, and monthly household income. Participants who selected "Prefer not to answer" for household income (n = 71) were excluded from the income comparisons (n = 392). Tukey's post hoc test was used to identify significant pairwise differences following statistically significant ANOVA results. Multivariable linear regression with heteroscedasticity-consistent (HC3) standard errors was then used to identify characteristics independently associated with each score. For these models, sparse categories were merged (55 years or older; divorced, separated, or widowed; secondary school or less; and employed or self-employed), and "prefer not to answer" was kept as a separate income category so that all 463 participants were included. The regression models were fitted in Python (statsmodels, version 0.15). Statistical significance was defined as a two-sided P value of less than 0.05.

Ethical considerations

Ethical approval was obtained from the Research Ethics Committee at King Faisal University on 9 September 2026 (approval number: KFU-REC-2026-SEP-ETHICS4474). Participation was voluntary. The information sheet explained the study purpose, procedures, expected duration, potential inconvenience, absence of direct clinical benefit, confidentiality protections, and participants' right to stop before submission without penalty. Consent was recorded electronically through the mandatory consent question at the start of the form. Data were stored in encrypted, access-restricted files.

Results

Table 1. Sociodemographic characteristics of the participants (N = 463)

Characteristics	Categories	N	%
Age group	18-24 years	115	24.8
	25-34 years	73	15.8
	35-44 years	99	21.4
	45-54 years	124	26.8
	55-64 years	50	10.8
	65 years or older	2	0.4
Sex	Male	263	56.8
	Female	200	43.2
Marital status	Single	144	31.1
	Married	304	65.7
	Divorced or separated	11	2.4
	Widowed	4	0.9
Highest educational level completed	Less than secondary school	20	4.3
	Secondary school	108	23.3
	Diploma	66	14.3
	Bachelor degree	245	52.9
	Postgraduate degree	24	5.2
Current employment status	Employed	192	41.5
	Self-employed	10	2.2
	Unemployed	34	7.3
	Student	89	19.2
	Retired	51	11.0
	Homemaker	87	18.8
Approximate monthly household income	Less than SAR 5,000	72	15.6
	SAR 5,000-9,999	109	23.5
	SAR 10,000-14,999	95	20.5
	SAR 15,000 or more	116	25.1
	Prefer not to answer	71	15.3

SAR, Saudi riyal.

A total of 463 adult residents of Al-Ahsa were included in the study. The largest age groups were 45–54 years (n = 124, 26.8%) and 18–24 years (n = 115, 24.8%), and only two participants (0.4%) were aged 65 years or older. Most participants were male (n = 263, 56.8%), married (n = 304, 65.7%), and held a bachelor's degree (n = 245, 52.9%). Employed participants formed the largest employment group (n = 192, 41.5%), followed by students (n = 89, 19.2%) and homemakers (n = 87, 18.8%). The most frequently reported monthly household income was SAR 15,000 or more (n = 116, 25.1%), and 71 participants (15.3%) preferred not to report their income (Table 1).

Table 2. Knowledge of Takotsubo cardiomyopathy: item scores (N = 463)

No	Item	Mean	SD
1	Takotsubo cardiomyopathy can temporarily weaken the heart's ability to contract and pump blood	0.49	0.50
2	Takotsubo cardiomyopathy is always caused by a blocked coronary artery†	0.15	0.36

No	Item	Mean	SD
3	Its symptoms can resemble those of an acute heart attack	0.41	0.49
4	Severe emotional stress can trigger Takotsubo cardiomyopathy	0.59	0.49
5	Serious physical illness or surgery can trigger Takotsubo cardiomyopathy	0.27	0.45
6	Only sadness or other negative emotions can trigger Takotsubo cardiomyopathy†	0.17	0.38
7	Takotsubo cardiomyopathy can occur without an obvious trigger	0.22	0.42
8	Takotsubo cardiomyopathy cannot occur in men†	0.46	0.50
9	Sudden chest pain and shortness of breath can occur with Takotsubo cardiomyopathy	0.54	0.50
10	Chest pain that begins after emotional stress can safely be watched at home without urgent assessment†	0.29	0.45
11	Takotsubo cardiomyopathy can be diagnosed from symptoms alone†	0.35	0.48
12	Tests such as an ECG, blood tests, heart imaging, and assessment of the coronary arteries may be needed to diagnose it	0.54	0.50
13	Heart function often improves or returns toward normal within days to weeks	0.35	0.48
14	Because recovery is common, Takotsubo cardiomyopathy cannot cause serious complications†	0.25	0.43
15	Possible complications include heart failure, dangerous heart rhythms, shock, blood clots or stroke, and death	0.44	0.50
16	Takotsubo cardiomyopathy can recur after recovery	0.40	0.49
	Total knowledge score (range 0–16)	5.93	4.74

Item values are the proportion of participants answering correctly (correct = 1; incorrect or "I don't know" = 0). †False statement; "false" was the correct response. SD, standard deviation; ECG, electrocardiogram.

The mean total knowledge score was 5.93 ± 4.74 out of 16 (37.07% of the maximum possible score). One hundred and ten participants (23.8%) scored zero, including 105 (22.7%) who answered "I don't know" to all 16 items. The item with the highest level of knowledge was "Severe emotional stress can trigger Takotsubo cardiomyopathy," with a mean score of 0.59, followed by "Sudden chest pain and shortness of breath can occur with Takotsubo cardiomyopathy" and "Tests such as an ECG, blood tests, heart imaging, and assessment of the coronary arteries may be needed to diagnose it," with a mean score of 0.54 for both. The lowest item score was for "Takotsubo cardiomyopathy is always caused by a blocked coronary artery," with a mean score of 0.15, followed by "Only sadness or other negative emotions can trigger Takotsubo cardiomyopathy," with a mean score of 0.17 (Table 2).

Table 3. Attitudes toward Takotsubo cardiomyopathy: item scores (N = 463)

No	Item	Mean	SD
1	Suspected Takotsubo cardiomyopathy should be treated with the same urgency as a suspected heart attack	4.08	0.88
2	I would call an ambulance or emergency medical services for sudden severe chest pain, severe shortness of breath, or fainting.	4.41	0.78
3	I would not delay seeking help simply because symptoms began after an emotional event	4.02	0.92
4	Heart symptoms that begin after emotional stress are 'just psychological' and need less medical attention	2.90	1.23
5	Medical follow-up is unnecessary once heart function has recovered	3.49	1.16
6	If the symptoms improve quickly, it is acceptable to cancel urgent medical assessment	3.38	1.16
	Overall attitude score (mean of the six items)	3.71	0.65

Items were scored from 1 (strongly disagree) to 5 (strongly agree), and items 4–6 were reverse-scored, so higher scores indicate more favorable attitudes for every item. The overall attitude score is the mean of the six item scores. SD, standard deviation.

The overall mean attitude score was 3.71 ± 0.65 out of 5. The highest item score was for "I would call an ambulance or emergency medical services for sudden severe chest pain, severe shortness of breath, or fainting," with a mean score of 4.41, followed by "Suspected Takotsubo cardiomyopathy should be treated with the same urgency as a suspected heart attack" (4.08). The lowest item score was for "Heart symptoms that begin after emotional stress are 'just psychological' and need less medical attention," with a mean score of 2.90 (Table 3).

Table 4. Knowledge scores by sociodemographic characteristics (N = 463)

Characteristics	Categories	Mean ± SD	Test	Test statistic	P-value
Age group	18-24 years	5.05 ± 4.60	ANOVA	1.401	0.222
	25-34 years	6.07 ± 4.86			
	35-44 years	6.55 ± 5.13			
	45-54 years	6.03 ± 4.61			
	55-64 years	6.14 ± 4.30			
	65 years or older	9.50 ± 0.71			
Sex	Male	5.75 ± 4.91	Welch's t test	-0.958	0.338
	Female	6.17 ± 4.50			
Marital status	Single	4.99 ± 4.59[a]	ANOVA	4.617*	0.003
	Married	6.37 ± 4.75[b]			
	Divorced or separated	4.45 ± 4.30[ab]			
	Widowed	10.75 ± 2.87[ab]			

Characteristics	Categories	Mean ± SD	Test	Test statistic	P-value
Highest educational level completed	Less than secondary school	5.30 ± 4.68	ANOVA	1.005	0.404
	Secondary school	5.80 ± 4.87			
	Diploma	6.98 ± 4.40			
	Bachelor degree	5.76 ± 4.70			
	Postgraduate degree	5.88 ± 5.44			
Current employment status	Employed	6.14 ± 4.95[ab]	ANOVA	2.304*	0.044
	Self-employed	6.60 ± 4.67[ab]			
	Unemployed	4.65 ± 4.31[ab]			
	Student	4.90 ± 4.69[a]			
	Retired	5.92 ± 4.37[ab]			
	Homemaker	6.95 ± 4.48[b]			
Approximate monthly household income	Less than SAR 5,000	6.51 ± 4.40	ANOVA	0.808	0.490
	SAR 5,000-9,999	6.46 ± 4.47			
	SAR 10,000-14,999	6.20 ± 4.92			
	SAR 15,000 or more	5.61 ± 4.92			

Within each characteristic, groups with different superscript letters differ significantly according to Tukey's post hoc test ($p < 0.05$); groups sharing a letter do not. *$p < 0.05$. Household income comparisons exclude participants who preferred not to answer (n = 392). ANOVA, analysis of variance; SD, standard deviation; SAR, Saudi riyal.

Knowledge scores differed significantly by marital status (F = 4.617, P = 0.003). Tukey's post hoc test revealed that married participants had significantly higher scores than single participants. Knowledge scores also differed significantly by current employment status (F = 2.304, P = 0.044). Tukey's post hoc test indicated that homemakers had significantly higher scores than students. No significant differences were observed by age group, sex, highest educational level completed, or approximate monthly household income (Table 4).

Table 5. Attitude scores by sociodemographic characteristics (N = 463)

Characteristics	Categories	Mean ± SD	Test	Test statistic	P-value
Age group	18-24 years	3.62 ± 0.68	ANOVA	1.301	0.262
	25-34 years	3.67 ± 0.69			
	35-44 years	3.82 ± 0.64			
	45-54 years	3.76 ± 0.61			
	55-64 years	3.67 ± 0.59			
	65 years or older	3.83 ± 0.24			
Sex	Male	3.67 ± 0.67	Independent-samples t test	-1.749	0.081
	Female	3.77 ± 0.61			
Marital status	Single	3.61 ± 0.70[a]	ANOVA	4.516*	0.004
	Married	3.77 ± 0.60[ab]			
	Divorced or separated	3.44 ± 0.83[a]			
	Widowed	4.46 ± 0.42[b]			
Highest educational level completed	Less than secondary school	3.90 ± 0.69	ANOVA	1.237	0.295
	Secondary school	3.62 ± 0.62			
	Diploma	3.68 ± 0.54			
	Bachelor degree	3.74 ± 0.66			
	Postgraduate degree	3.76 ± 0.75			
Current employment status	Employed	3.66 ± 0.67	ANOVA	0.843	0.519
	Self-employed	3.75 ± 0.61			
	Unemployed	3.67 ± 0.70			
	Student	3.70 ± 0.66			
	Retired	3.82 ± 0.59			
	Homemaker	3.80 ± 0.58			
Approximate monthly household income	Less than SAR 5,000	3.67 ± 0.65	ANOVA	0.593	0.620
	SAR 5,000-9,999	3.67 ± 0.68			
	SAR 10,000-14,999	3.75 ± 0.62			
	SAR 15,000 or more	3.77 ± 0.63			

Within each characteristic, groups with different superscript letters differ significantly according to Tukey's post hoc test ($p < 0.05$); groups sharing a letter do not. *$p < 0.05$. Household income comparisons exclude participants who preferred not to answer (n = 392). ANOVA, analysis of variance; SD, standard deviation; SAR, Saudi riyal.

Attitude scores differed significantly by marital status (F = 4.516, P = 0.004). Tukey's post hoc test revealed that widowed participants had significantly higher scores than single and divorced or separated participants, although the widowed group comprised only four participants. No significant differences were observed by age group, sex, highest educational level completed, current employment status, or approximate monthly household income (Table 5).

Table 6. Multivariable linear regression of knowledge and attitude scores (N = 463)

Characteristic	Category	Knowledge B (95% CI)	p	Attitude B (95% CI)	p
Age group	18–24 years	Reference		Reference	
	25–34 years	−0.28 (−2.26 to 1.69)	0.777	0.08 (−0.22 to 0.38)	0.600
	35–44 years	−0.31 (−2.49 to 1.86)	0.776	0.22 (−0.10 to 0.54)	0.173
	45–54 years	−0.57 (−2.73 to 1.58)	0.601	0.12 (−0.21 to 0.44)	0.489

Characteristic	Category	Knowledge B (95% CI)	p	Attitude B (95% CI)	p
	55 years or older	−0.15 (−2.38 to 2.09)	0.898	−0.02 (−0.38 to 0.34)	0.902
Sex	Male	Reference		Reference	
	Female	0.18 (−0.99 to 1.35)	0.762	0.08 (−0.09 to 0.25)	0.361
Marital status	Single	Reference		Reference	
	Married	0.91 (−0.58 to 2.39)	0.231	0.15 (−0.09 to 0.39)	0.211
	Divorced, separated, or widowed	0.60 (−2.39 to 3.58)	0.695	0.09 (−0.44 to 0.62)	0.737
Highest educational level completed	Secondary school or less	Reference		Reference	
	Diploma	0.94 (−0.62 to 2.50)	0.238	0.03 (−0.17 to 0.23)	0.745
	Bachelor degree	−0.06 (−1.24 to 1.13)	0.927	0.08 (−0.08 to 0.25)	0.320
	Postgraduate degree	0.22 (−2.33 to 2.78)	0.865	0.07 (−0.29 to 0.44)	0.696
Current employment status	Employed or self-employed	Reference		Reference	
	Unemployed	−1.39 (−3.19 to 0.41)	0.129	0.03 (−0.23 to 0.30)	0.802
	Student	−0.75 (−2.66 to 1.16)	0.442	0.28 (−0.02 to 0.58)	0.067
	Retired	−0.46 (−2.01 to 1.09)	0.559	0.23 (0.00 to 0.45)	0.048
	Homemaker	0.53 (−0.98 to 2.05)	0.491	0.09 (−0.12 to 0.30)	0.395
Approximate monthly household income	Less than SAR 5,000	Reference		Reference	
	SAR 5,000–9,999	−0.15 (−1.53 to 1.23)	0.829	−0.03 (−0.24 to 0.17)	0.737
	SAR 10,000–14,999	−0.43 (−1.92 to 1.05)	0.570	0.03 (−0.18 to 0.24)	0.770
	SAR 15,000 or more	−0.76 (−2.25 to 0.73)	0.319	0.09 (−0.12 to 0.30)	0.400
	Prefer not to answer	−1.45 (−3.01 to 0.11)	0.068	0.04 (−0.19 to 0.27)	0.752
Model	R^2 (adjusted R^2)	0.046 (0.008)		0.046 (0.007)	
	Robust F (p)	1.29 (0.188)		1.27 (0.204)	

B, unstandardized regression coefficient; CI, confidence interval; SAR, Saudi riyal. Both models include all six characteristics and use heteroscedasticity-consistent (HC3) standard errors; the robust F tests all coefficients jointly with the same standard errors. Knowledge scores range from 0 to 16 and attitude scores from 1 to 5.

In the multivariable models, the six characteristics together explained little of the variation in knowledge (R^2 = 0.046; robust F = 1.29, p = 0.188) or attitude scores (R^2 = 0.046; robust F = 1.27, p = 0.204). No characteristic was independently associated with knowledge. The difference between married and single participants fell from 1.38 to 0.91 points after adjustment (95% confidence interval [CI] −0.58 to 2.39, p = 0.231), and employment status was no longer significant (robust F = 1.16, p = 0.329). For attitudes, retired participants scored slightly higher than employed or self-employed participants (B = 0.23, 95% CI 0.00 to 0.45, p = 0.048), but employment status as a whole was not significant (robust F = 1.94, p = 0.102), and marital status was not associated with attitudes once widowed participants were grouped with divorced and separated participants (robust F = 0.79, p = 0.455) (Table 6).

Discussion

Knowledge of Takotsubo cardiomyopathy was limited in this sample. On average, participants answered just over a third of the knowledge items correctly, and almost a quarter answered none correctly. Stated willingness to seek emergency care was much stronger. The largest gaps concerned coronary obstruction and triggers other than negative emotions, whereas emotional stress as a trigger, the main symptoms, and the need for diagnostic tests were better known. In unadjusted comparisons, married participants and homemakers had higher knowledge scores and widowed participants had more favorable attitudes, but none of these differences held after adjustment for the other characteristics.

A Saudi online survey found moderate knowledge of cardiovascular diseases alongside favorable attitudes toward prevention [16]. Our lower proportion of the maximum score may indicate a particular need for education about Takotsubo cardiomyopathy, although differences in questionnaire content, scoring, recruitment, and populations prevent a direct comparison. In a Syrian preprint, just over half of respondents had heard of the condition, and responses linked it mainly to psychological or emotional events [15]. Having heard of a condition is not the same as knowing facts about it, and the Syrian sample was small and mostly young and female [15].

The item scores suggest that participants linked the condition with emotion more readily than with its other triggers. The popular name ‘broken heart syndrome’ may encourage this narrow view, although we did not test how terminology influenced responses. Physical triggers are common, some patients have no identifiable trigger [2,3], and in the International Takotsubo Registry, physical triggers were more frequent than emotional ones [3]. Pleasant emotional events can also precede the condition [18]. Education should therefore cover physical stress, positive emotions, and the possibility of no obvious trigger, which correspond to some of the weakest knowledge items.

The low score on the coronary obstruction item matters because Takotsubo syndrome is defined by the absence of an acute culprit coronary blockage, and coexisting coronary artery disease does not rule it out [2]. Education can explain this in plain terms, so that the condition is seen neither as an ordinary blocked-artery heart attack nor simply as a reaction to sadness.

Symptoms and diagnostic tests were better recognized, which gives education a starting point. Fewer participants rejected the statement that chest pain after emotional stress can safely be watched at home, so some participants who recognize the symptoms may not know how to act on them. Takotsubo syndrome can resemble acute coronary syndrome, and clinical assessment and investigations are needed to tell the two apart [2,12]. Ventricular function often recovers, but serious acute complica-

tions, including cardiogenic shock, arrhythmias, and thromboembolic events, still occur [3,12]. Educational messages should link symptom recognition with prompt assessment and explain why an emotional trigger or an expected recovery is no reason to delay care.

Limited knowledge and favorable stated attitudes coexisted in this sample, which suggests that willingness to seek help may not depend on detailed understanding of the disease. We did not analyze the relationship between the two scores, and participants may have chosen the socially expected answer to emergency-care statements without knowing how they would act. Local studies point to a gap between intention and action. In an Al-Ahsa study of heart attack awareness, respondents described hesitating to seek immediate care because of embarrassment, cost, and uncertainty about symptom severity [17]. In another Al-Ahsa survey, only slightly more than half chose calling an ambulance as the first response to myocardial infarction symptoms [19]. The contrast with our results may reflect the condition studied, the wording of the questions, or the difference between endorsing an ideal response and weighing practical barriers. Agreeing with a hypothetical statement is not the same as choosing the right first action, so actual decision-making needs to be studied directly.

The unadjusted differences by marital and employment status did not persist in the multivariable models, so they may reflect differences in age, health experience, or other characteristics rather than independent effects. The only adjusted difference, slightly more favorable attitudes among retired than employed or self-employed participants, was borderline ($p = 0.048$), and employment status as a whole was not significant. Married participants and homemakers may have more contact with family health matters, but we did not measure such exposure. A Saudi cardiovascular survey found the opposite pattern, with lower odds of higher knowledge among married than single participants [16], which argues against marriage itself as an explanation. The higher attitude scores of widowed participants rested on four respondents and were not seen once widowed participants were grouped with divorced and separated participants.

Educational level was not associated with knowledge, whereas higher educational attainment was associated with greater awareness of myocardial infarction symptoms and risk factors in a Saudi community sample [20]. The difference may reflect limited exposure to this particular condition across educational groups, differences in questionnaire content or sample composition, or measurement variability. As in the Saudi cardiovascular survey [16], knowledge did not differ by sex. Non-significant results do not show that groups are equal, but they give no reason to direct education at particular groups rather than the public as a whole.

This study has limitations. The cross-sectional design cannot establish causation. Recruitment through the data collectors' networks and social media over nine days may have under-represented residents with limited internet access or little interest in health surveys, so the results describe this sample rather than the population of Al-Ahsa. Attitudes were self-reported and may be affected by social desirability. Several subgroups were small, and the internal consistency of the attitude scale was just below the conventional 0.70 threshold. Many unadjusted comparisons were made, and some may have reached significance by chance. Even so, the item-level results show which misconceptions education should address first.

Brief Arabic educational materials delivered through primary care services, community activities, and social media could cover the range of triggers, the misconception about coronary obstruction, the possibility of complications, and the need for urgent assessment. Scenario-based messages could connect facts with decisions about seeking help, and materials should be tested for clarity before wider use. Future studies should use more representative sampling, explore in qualitative interviews why people link the condition mainly with emotional distress and what delays care, and run controlled educational studies that follow up knowledge retention, responses to realistic scenarios, and, where feasible, actual help-seeking.

Conclusion

Knowledge of Takotsubo cardiomyopathy was limited among surveyed adults in Al-Ahsa, while stated willingness to seek emergency care was comparatively strong. The largest gaps concerned coronary obstruction and the range of possible triggers. No sociodemographic characteristic was clearly associated with either score after adjustment, which supports accessible education for the general public that links accurate knowledge with the right response to concerning symptoms. Interventional studies in more representative samples should test whether better knowledge leads to timely help-seeking.

Declarations

Ethical approval: The study was approved by the Research Ethics Committee at King Faisal University on 9 September 2026 (approval number KFU-REC-2026-SEP-ETHICS4474).

Consent to participate: Participants gave electronic informed consent through a mandatory question at the start of the questionnaire.

Use of artificial intelligence: An artificial intelligence tool was used during editorial processing to check the analysis against the raw data and to verify the references.

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