Research Article

A Prospective Observational Study on Acute Coronary Syndrome: Exploring Knowledge, Attitude and Practice Gaps in Women Regarding Symptoms, Risk Factors and Treatment Options

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Abstract

Acute Coronary Syndrome (ACS) remains a significant global health issue, disproportionately affecting women due to delayed recognition, misdiagnosis, and under-treatment. This study aims to assess the knowledge, attitude, and practice (KAP) gaps in women regarding ACS symptoms, risk factors, and treatment. Conducted as a six-month prospective observational study at Vivekananda Super Speciality Hospital, 170 women diagnosed with ACS participated. The results highlighted that hypertension and diabetes were the most common risk factors, while chest pain was the predominant symptom. Initial assessments showed that most participants had average knowledge (53%), while 51% had poor overall KAP scores. However, post-intervention follow-up demonstrated substantial improvements, with good knowledge increasing from 13% to 36% and good KAP scores rising from 3.6% to 37.7%. Quality of Life (QOL) scores also improved significantly. These findings underscore the need for targeted educational initiatives and gender-sensitive approaches to ACS diagnosis and management. Addressing Yentl Syndrome and enhancing awareness could reduce ACS-related morbidity and mortality in women.

Introduction

Acute Coronary Syndrome (ACS) is a major global health concern and remains a leading cause of morbidity and mortality among women worldwide [1]. ACS encompasses unstable angina, non-ST-elevation myocardial infarction (NSTEMI), and ST-elevation myocardial infarction (STEMI), all resulting from a sudden reduction in coronary blood flow due to atherosclerotic plaque rupture, thrombus formation, or coronary vasospasm [2,3]. Despite advancements in diagnosis and treatment, women remain disproportionately affected due to delayed recognition, misdiagnosis, and undertreatment [4].

Gender-specific differences in acs presentation and risk factors

Historically, cardiovascular research has been predominantly male-centered, leading to an incomplete

understanding of how ACS manifests in women [4]. While men typically present with classic chest pain, women often exhibit atypical symptoms such as nausea, shortness of breath, dizziness, profound fatigue, and pain in the jaw, neck, or back [5,6]. These non-traditional symptoms contribute to delays in seeking medical attention, misdiagnosis, and suboptimal treatment, increasing the risk of adverse cardiovascular events [7,8].

ACS in women is influenced by both traditional and unique risk factors. Established risk factors include hypertension, diabetes, dyslipidemia, obesity, smoking, and physical inactivity [9,10]. However, women also experience hormonal fluctuations, pregnancy-related complications (preeclampsia, gestational diabetes), and postmenopausal estrogen decline, which accelerate vascular dysfunction and plaque instability [11,12]. Additionally, psychosocial stressors, socioeconomic disparities, and limited healthcare access further exacerbate gender-based disparities in cardiovascular health [13-15].

Challenges in ACS diagnosis and the impact of yentl syndrome

One of the key barriers to ACS management in women is the underutilization of evidence-based therapies [4]. Women are less likely to receive timely diagnostic interventions, including electrocardiograms (ECG), cardiac biomarkers (troponins, CK-MB), and coronary angiography, leading to missed or delayed diagnoses [16]. Additionally, they are less likely to undergo primary reperfusion therapy, coronary artery bypass grafting (CABG), or percutaneous coronary intervention (PCI), even when presenting with high-risk features [17].

This disparity is largely attributed to "Yentl Syndrome," a term describing gender bias in cardiovascular medicine, where women are treated less aggressively unless they present with symptoms similar to men [18]. Consequently, women with ACS experience higher hospital readmission rates, increased in-hospital mortality, and long-term cardiovascular complications [19]. Addressing these challenges requires increased awareness among healthcare providers, implementation of gender-specific diagnostic tools, and enhanced patient education to promote early recognition and timely intervention [20].

Study objective

The objective of this study is to evaluate knowledge, attitude, and practice (KAP) gaps in women regarding ACS symptoms, risk factors, and treatment options. By assessing pre- and post-intervention awareness levels, this research aims to improve early diagnosis, healthcare-seeking behaviors, and treatment adherence among women. The findings will support the development of targeted awareness programs and clinical interventions to bridge the gender gap in cardiovascular health and reduce ACS-related mortality in women.

Methodology

The methodology section describes in detail all the materials that have been used to conduct a study as well as the procedures that are under taken.

Study design: A hospital-based Prospective Observational Study

Study site: The study was conducted at the Vivekananda Super Speciality Hospital, Narasaraopet, Palnadu district.

Study period: The study was conducted over a period of 6 months.

Sample size: A total of 170 women subjects who were diagnosed with acute coronary syndrome and on regular check-ups were included in the study. Those who fulfilled the exclusion and inclusion criteria were selected for the study.

Study criteria: The study will be carried out by considering the following criteria:

Inclusion criteria

- Age > 20 years.

- Women who are diagnosed with ACS.

- Patient should be with a confirmed diagnosis of ACS in medical records by abnormal cardiac bio-markers, ECG changes symptomology.

- Patient should have ability to understand and speak Telugu, English, and Hindi.

Exclusion criteria

- Age < 20years.

- Gender- Male

- Multiple diagnosis of CVS which complicates the reorganization of ACS condition.

- Cognitive impairment or inability to understand or communicate.

Results and discussion

The information provides the summary of all the results that are characterized based on various parameters.

Table 1: The distribution based on age as shown in Table 1. The data reveals that the highest prevalence of ACS is observed in the 50-59 age group of 30%($n = 59$). Followed by the 60-69 age group 30%($n = 51$), and the 40-49 age group, with $n = 36$ (21.17%). 70-79 age group includes $n = 11$ (6.47%), 80-90 age group has $n = 5$ (2.90%), $n = 7$ (4.11%) in the 30-39 age group and only $n = 1$ (0.58%) in the 20-29 age group (Figure 1).

Table 1: Distribution based on Age of study population.

Age group	No. of patients	Percentage [%]
20-29	1	0.5
30-39	7	4
40-49	36	21
50-59	59	35
60-69	51	30
70-79	11	6.5
80-90	5	3
Grand Total	170	100

Figure 1: Distribution based on Age of study population.

Table 2: Distribution based on literacy rate of study population.

Parameters	No. of patients	Percentage [%]
Literacy rate	16	9.4
Illiteracy rate	154	90.58
Grand total	170	100

Figure 2: Distribution based on literacy rate of study population.

Table 3: Distribution based on BMI class of study population.

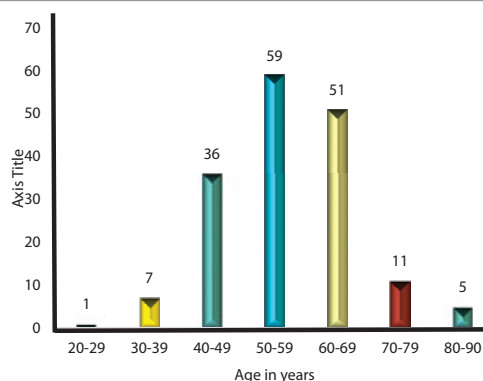| BMI ranges (kg/m²)	No. of Patients	Percentage [%]
Under weight	7	4
Normal weight	78	46
Over weight	53	31
Obesity	3	1.7
Class-I obesity	21	12.3
Class-II obesity	7	4.1
Class-III obesity	1	0.5
Grand Total	170	100

Figure 3: Distribution based on BMI class of study population.

Table 2: The data represents the literacy distribution among a total of 170 patients. Out of the total, 16 patients (9.4%) were literate, while a significantly larger group of 154 patients (90.58%) were illiterate. This indicates that the majority of the patients had not received formal education. The table underscores a high illiteracy rate within the patient population surveyed (Figure 2).
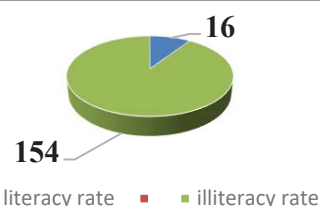
Table 3: Distribution based on BMI as shown in Table 2. Among 170 selected subjects most of the patients were overweight (n = 53), 31.17%, while the fewest were in class-III obesity 1 patient, 0.588%. The breakdown includes 7 underweight patients, 78 with normal weight, 3 with obesity, 21 in class-I obesity, and 7 in class-II obesity. This data highlights that overweight individuals formed the largest group, whereas severe obesity was rare (Figure 3).

Table 4: Distribution based on risk factors as shown in Table 3. Among 170 selected subjects, most of the population has major risk factor of hypertension n = 48, (28.23%), followed by type 2 diabetes mellitus (T2DM) alone n = 27, (15.88%), HTN with T2DM n = 24, (14.11%) and subjects with no risk factors n = 43 (23.5%) (Figure 4).

Table 5: Distribution based on occupation as shown in Table 4. Most of the highest incidence was observed among housewives, accounting for 47.05% (n = 80). Followed by daily wagers at 18.82% (n = 32), agriculture workers at 9.41% (n = 16), and household workers at 7.64% (n = 13). Teachers comprised 7.05% (n = 12) of the cases, while factory workers represented 2.94% (n = 5). Additionally, cigar workers, tailors, and software professionals each accounted for 2.35% (n = 4) of the cases (Figure 5).
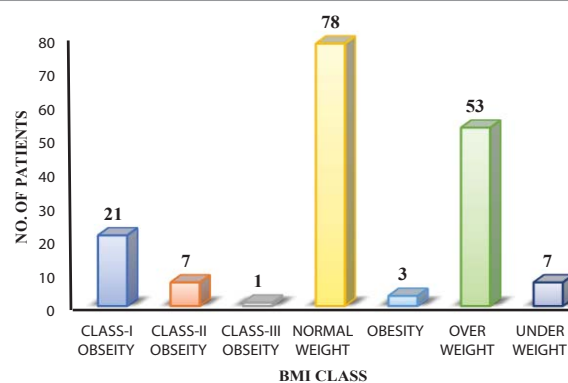
Table 4: Distribution based on risk factors of study population.

Risk Factors	No. of Patients	Percentage [%]
Htn	48	28
Htn, cad	4	2.5
Htn, hyperthyroidism	1	0.6
Htn, hypothyroidism	3	2
Htn, t2dm	24	14
Htn,t2dm,hypothyroidim	4	2.3
Htn,t2dm,hypothyroidim, cad	1	0.6
Htn, tobacco smoker	1	0.6
Hyperthyroidism	2	1.1
Hypothyroidism	3	2
None	43	25.3
T2dm	27	16.2
T2dm, cad	2	1.1
T2dm, hypothyroidism	4	2.5
T2dm, mi	1	0.6
T2dm, ptca	1	0.6
Tobacco smoker	1	0.6
Grand Total	170	100

Figure 4: Distribution based on risk factors of study population.

Table 5: Distribution based on occupation of study population.

Occupation	No. of Patients	Percentage [%]
Agriculture worker	16	9.4
Cigar worker	4	2.3
Daily wager	32	19
Factory worker	5	3
House hold worker	13	7.6
House wife	80	47
Tailor	4	2.3
Teacher	12	7.05
Software holder	4	2.35
Grand total	170	100

Figure 5: Distribution based on occupation of study population.

Table 6: Distribution base on type of presentation as shown in Table 5. It highlights chest pain as the most prevalent symptom, affecting 33% (n = 56), followed by chest pain associated with sweating 16%,(n = 28). Pain radiating to the shoulders, neck, and back accounts for 8.8% (n = 15), while shortness of breath (SOB) is reported by 6% (n = 11). Other notable symptoms include palpitations 5%,(n = 9), nausea 4%,(n = 7), and vomiting (3.5%,(n = 6), fatigue 3%, (n = 5), jaw pain 3%, (n = 5), indigestion 1%,(n = 2), nausea, vomiting, and dizziness (1-4%), as well as anxiety and confusion (1%) (Figure 6).

Table 7: Distribution based on knowledge levels at initial visit as shown in Table 6. The data shows that most patients had average knowledge n = 90(52.94%). Followed by poor knowledge has n = 58(34.17%), fewer in good knowledge has n = 22(12.94%) (Figure 7).
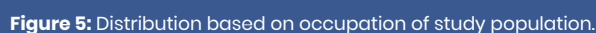
Table 8: Distribution based on attitude levels at initial visit as shown in Table 7. The data shows that most patients had average attitude n = 128(75.3%). Followed by poor attitude has n = 35(20.5%), fewer in good attitude has n = 7 (4.11%) (Figure 8).

Table 6: Distribution base on type of presentation of study population.

Type Of Presentation	No. of Patients	Percentage [%]
Chest Pain	56	33
Chest Pain Associating with Sweating	28	16
Pain Radiating to Shoulders, neck, & back	15	8.8
SOB	11	6
Headache	4	2.3
Diarrhoea	2	1
Fatigue	5	3
Palpitations	9	5
Fainting	5	3
Giddiness	3	1.7
Nausea	7	4
Vomitings	6	3.5
Jaw Pain	5	3
Fever	2	1
Stomach Pain	3	1.7
Dyspnea	2	1
Pedal Edema	2	1
Loss Of Appitite	1	0.5
Abdominal Pain	1	0.5
Indigestion	2	1
Confusion	2	1
Anxiety	1	0.5
Acidity	1	0.5
Pedal Edema	2	1
Grand total	170	100

Figure 6: Distribution base on type of presentation of study population.

Table 7: Distribution based on knowledge at initial visit of study population.

Knowledge	No. of patients	Percentage [%]
Poor	58	34
Average	90	53
Good	22	13
Grand total	170	100

Figure 7: Distribution based on knowledge at initial visit of study population.

Table 8: Distribution based on Attitude at initial visit of study population.

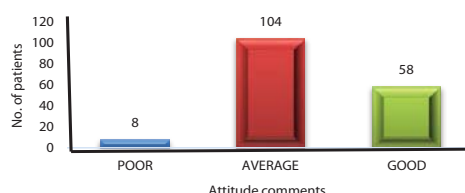| Attitude	No. of patients	Percentage[%]
Poor	35	20.5
Average	128	75.5
Good	7	4
Grand Total	170	100

Figure 8: Distribution based on Attitude at initial visit of study population.

Table 9: Distribution based on Practice at initial visit of study population.

Practice	No. of patients	Percentage [%]
Poor	97	57
Average	70	41
Good	3	2
Grand total	170	100

Figure 9: Distribution based on Practice at initial visit of study population.

Table 9: Distribution based on practice levels at initial visit as shown in Table 8. The data shows that most patients had average practice *n* = 70(41.17%). Followed by poor practice has *n* = 97(57.05%), fewer in good practice has *n* = 3(1.76%) (Figure 9).

Table 10: Distribution based on overall KAP scoring at Initial visit as shown in Table 9. A significant portion of the patients, 87 individuals (51.17%), were classified as having a poor KAP score, indicating that more than half of the patient population demonstrated lower levels of knowledge, attitude, and practice. The next largest group, 77 patients (45.3%), had an average KAP score, suggesting that many patients performed at a moderate level in these areas. Only 6 patients (3.52%) were classified as having a good KAP score, reflecting a very small proportion with higher knowledge, attitude, and practice. This distribution emphasizes that most patients fall within the average to poor range in terms of KAP (Figure 10).

Table 11: Distribution based on knowledge levels at follow up visit as shown in Table 10. The data shows that most patients had average knowledge *n* = 102(60%). Followed by good knowledge has *n* = 61(35.9%), poor knowledge has *n* = 7(4.117%) (Figure 11).

Table 12: Distribution based on attitude levels at follow up visit as shown in Table 11. The data shows that most patients had average attitude *n* = 104(61.17%). Followed by good attitude has *n* = 58(34.11%), poor practice has *n* = 8(4.70%) (Figure 12).

Table 13: Distribution based on practice levels at follow up visit as shown in Table 12. The data shows that most patients had average attitude *n* = 105(61.76%). Followed by good practice has *n* = 43(25.30%), poor practice has *n* = 22(12.94%) (Figure 13).

Table 14: Distribution based on KAP (Knowledge, Attitude, and Practice) scores at follow up visit as shown in table 13. With most (97 individuals or 57.05%) falling into the average category, indicating a moderate level of understanding and adherence. A notable 64 patients (37.64%) achieved a good KAP score, reflecting strong knowledge and practice.
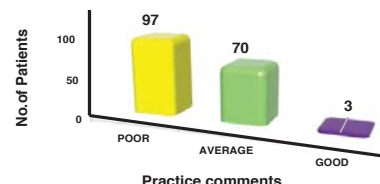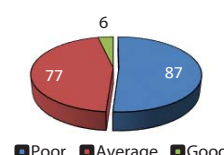
Table 10: Distribution based on overall KAP scoring at Initial visit of study population.

KAP Scoring	No. of Patients	Percentage [%]
Poor	87	51.1
Average	77	45.3
Good	6	3.6
Grand Total	170	100%

**Figure 10:** Distribution based on overall KAP scoring at Initial visit of study population.

Table 11: Distribution based on knowledge levels at follow up visit of study population.

Knowledge	No. of patients	Percentage [%]
Poor	7	4
Average	102	60
Good	61	36
Grand total	170	100
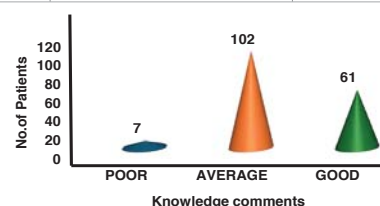
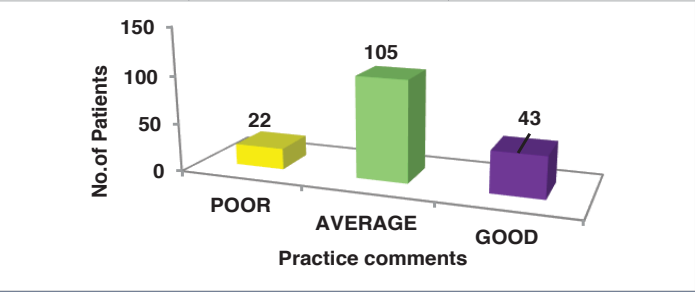**Figure 11:** Distribution based on knowledge levels at follow up visit of study population.

Table 12: Distribution based on Attitude levels at follow up of study population.

Attitude	No. of patients	Percentage [%]
POOR	8	4.7
AVERAGE	104	61.2
GOOD	58	34.1
Grand Total	170	100%
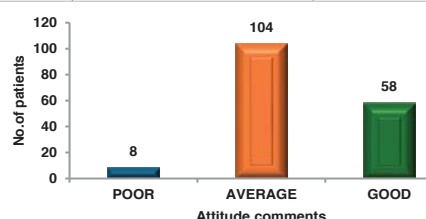
Figure 12: Distribution based on Attitude levels at follow up of study population.

Table 13: Distribution based on Practice levels at follow up of study population.
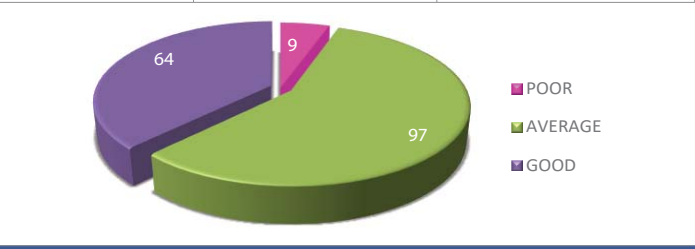
Practice	No. of patients	Percentage [%]
Poor	22	13
Average	105	61.7
Good	43	25.3
Grand total	170	100

Figure 13: Distribution based on Practice levels at follow up of study population.

Table 14: Distribution based on KAP scoring at follow up of study population.

KAP Score	No. of Patients	Percentage [%]
Poor	9	5.3
Average	97	57
Good	64	37.7
Grand Total	170	100

Figure 14: Distribution based on KAP scoring at follow up of study population.

Meanwhile, only 9 patients (5.29%) had poor scores, showing lower levels of awareness and adherence. Overall, the data suggests that the majority of patients performed at an average or good level, with only a small fraction scoring poorly (Figure 14).

Table 15: Distribution based on overall KAP % of both Initial and Follow up visit as shown in Table 14. Poor scores dropped from 28.82% (*n* = 49) to 3.53% (*n* = 6), while average scores declined from 58.82% (*n* = 100) to 35.29% (*n* = 60), reflecting overall progress. Good scores increased from 11.76% (*n* = 20) to 45.88% (*n* = 78), and excellent scores saw the most remarkable rise, from 0.59% (*n* = 1) to 15.29% (*n* = 26). This data highlights a clear upward trend in patients' knowledge, attitude, and practice over time (Figure 15).

Table 16: Distribution based on Quality of Life (QOL) comments from initial and follow-up visits as shown in Table 15. Highlights a noticeable shift in perception. Initially, the majority of comments (*n* = 101) rated QOL as Poor, while *n* = 69 were categorized as Average, and none were considered Good. However, by the follow-up visit, there was a significant improvement, with Average ratings rising to (*n* = 132), Poor ratings decreasing to (*n* = 12), and (*n* = 26) comments reflecting a good rating (Figure 16).

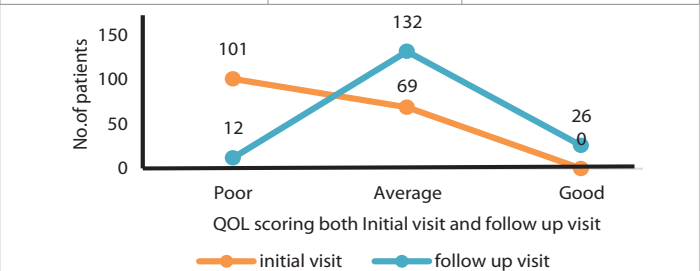**Table 15:** Distribution based on overall KAP % of both Initial and Follow up visit of study.

KAP%	Initial visit	Follow up visit
Poor	49	6
Average	100	60
Good	20	78
Excellent	1	26
Grand total	170	170
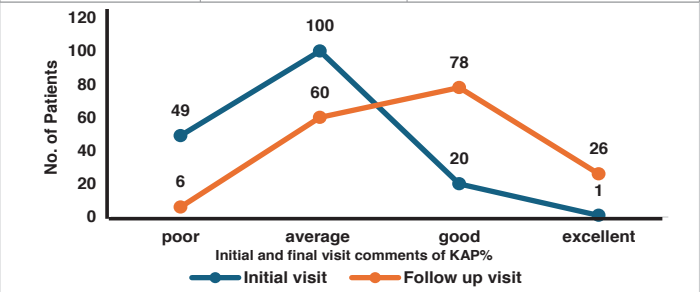
Figure 15: Distribution based on overall KAP % of both Initial and Follow up visit of study population.

Table 16: Distribution based on overall QOL scoring of both Initial and Follow up visit of study population.

QOL Comments	Initial visit	Follow up visit
Poor	101	12
Average	69	132
Good	0	26
Grand Total	170	170

Figure 16: Distribution based on overall QOL scoring of both Initial and Follow up visit of study population.

Discussion

This 6-month prospective observational study conducted at Vivekananda Super Speciality Hospital in Narasaraopet involved 170 women diagnosed with Acute Coronary Syndrome (ACS). Most of the patients were middle-aged to older adults, with the highest prevalence in the 50-59 and 60-69 age groups. The very low occurrence in younger patients (20-29) aligns with the understanding that ACS is more common in older individuals due to the natural stiffening of arteries and plaque accumulation.

A majority of the patients had a normal weight (45.88%) or were overweight (31.17%), with fewer in other categories. Being overweight can increase the risk of atherosclerosis, highlighting the importance of weight management. The most common risk factor was hypertension (28.23%), followed by a combination of hypertension and Type 2 Diabetes Mellitus (14.11%). Other prevalent conditions included coronary artery disease and thyroid disorders.

In terms of occupation, housewives (47.05%) and daily

wage earners (18.82%) were most affected, likely due to socio-economic factors, sedentary lifestyles, and limited access to healthcare. Chest pain was the most frequent symptom, followed by shortness of breath and sweating. Atypical symptoms, such as jaw pain and confusion, were also observed, underscoring the need for careful clinical evaluation.

At the initial visit, 52.94% of patients had an average level of knowledge, 34.17% had poor knowledge, and only 12.94% demonstrated good knowledge. A majority (75.3%) had a neutral attitude toward their health, and 57.05% showed poor adherence to recommended practices, indicating the necessity for enhanced education and behavioral support. The majority (51.17%) of patients had poor KAP scores.

By the follow-up visit, there was a noticeable improvement in patient knowledge, with 35.9% achieving good knowledge. A shift toward more proactive health behaviors was evident, with 34.11% exhibiting a positive attitude. Furthermore, 25.3% demonstrated improved practice adherence. Most patients (37.64%) achieved good KAP scores.

There was a significant improvement in KAP scores, with the percentage of patients with poor scores declining from 28.82% to 3.53%, while those with good scores increased from 11.76% to 45.88%. The proportion of patients with excellent scores grew from 0.59% to 15.29%. Quality of Life (QOL) also saw substantial improvement, with poor QOL dropping from 59.41% to 7.06%, and the percentage of patients reporting good QOL rising from 0% to 15.29%.

This study underscores the importance of enhancing knowledge, attitude, and practice for effective ACS management. The significant improvements in KAP and QOL scores emphasize the need for targeted educational initiatives and behavioral interventions, particularly for middle-aged individuals affected by hypertension and obesity.

Conclusion

This research highlights the pressing need to improve women's awareness, perceptions, and behaviors regarding Acute Coronary Syndrome (ACS). It brings attention to the significant gender-based differences in symptom identification and access to medical care, with Yentl Syndrome contributing to delays in diagnosis and poorer health outcomes. The study reveals a high prevalence of conditions such as hypertension, diabetes, and obesity, emphasizing the importance of routine health screenings and comprehensive cardiovascular risk evaluations. Educational initiatives have been shown to significantly enhance awareness, encourage proactive health practices, and support better adherence to treatment and lifestyle modifications.

The results demonstrate a considerable improvement in KAP levels and overall quality of life after targeted interventions. A decline in the number of individuals with poor scores, alongside an increase in those achieving good or excellent scores, reflects the positive impact of awareness campaigns. Addressing these disparities requires the implementation of gender-sensitive diagnostic approaches and specialized educational programs to ensure earlier detection and better ACS management in women. Continued research and public health efforts should focus on maintaining these improvements through sustained education, lifestyle interventions, and systemic healthcare advancements to lower cardiovascular-related mortality among women.

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