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A study to explore the factors related to treatment seeking behaviour of patients with acute coronary syndrome in a tertiary care hospital at Chennai

Ruthmary. S[1], Aruna Subramaniam[1]*, Ramesh C[2], Jaya Kumar[3], and Pratheesha Ilangovan[4]

[1]Department of Community Health Nursing, [2]Department of Medical Surgical Nursing, [4]Department of Child Health Nursing, Sri Ramachandra Faculty of Nursing, Sri Ramachandra Institute of Higher Education and Research (Deemed to be University), Chennai

[3]Sri Ramachandra Medical center, Department of cardiac care, Sri Ramachandra Institute of Higher Education and Research (Deemed to be University), Chennai

*Corresponding author: aruna.s@sriramachandra.edu.in

Abstract

Objective: The aim of the study was to explore the factors related to treatment seeking behavior of patients with acute coronary syndrome (ACS) in a tertiary care hospital at Chennai, and to compare these factors between patients who sought treatment promptly and those who experienced delays. Method: A total of 250 patients diagnosed with ACS were included in this descriptive cross-sectional study. Participants were interviewed using standardized tools including the Acute Coronary Syndrome Response Index and the Modified Response to Symptoms Questionnaire. Data were collected on sociodemographic characteristics, clinical features, symptom recognition, attitudes, beliefs, and knowledge of ACS risk factors. Patients were categorized into timely treatment seekers (<2 hours) and delayers (2 hours or more). Results: Only 29.3% of patients sought timely treatment, while 50.6% experienced delays exceeding 8 hours. The mean knowledge score on ACS symptoms was higher among timely seekers (mean = 14.15) compared to delayers (mean = 13.27), though overall, 37.2% had inadequate knowledge. The most common interpretation of symptoms was indigestion (38.4%), and only 19.6% identified symptom onset as abrupt. A statistically significant correlation was found between knowledge of symptoms and risk factors ($\rho = 0.000$). Beliefs about ACS were also significantly associated with treatment-seeking delay ($p = 0.043$). Only 2% used ambulances, with 83.6% relying on family transport. Most symptoms began at home (67.1%), and while 70.4% told someone nearby, only 26.4% contacted emergency services. Pain was often described as discomfort (39.6%) and most commonly located in the chest (34%) and left shoulder (33.2%). Conclusion: The study concludes that limited knowledge of ACS symptoms and risk factors, misinterpretation of symptoms, low perceived seriousness, and inadequate use of emergency services are major contributors to treatment seeking delay. Strengthening community education and emergency response behaviours could reduce pre-hospital delay and improve ACS outcomes.

1. Introduction

Cardiovascular diseases (CVDs) remain the leading cause of death globally, accounting for a significant share of worldwide mortality and illness. In 2021, approximately 20.5 million deaths were linked to CVDs, making up nearly one-third of all global deaths (1). Notably, coronary artery disease alone was responsible for 7.4 million of these deaths, highlighting the severe impact of Acute Coronary Syndrome (ACS) and the urgent need for prompt medical care.

Over the past three decades, the prognosis for ST-segment elevation myocardial infarction (STEMI) has significantly improved due to advances in reperfusion therapy, such as thrombolysis and primary percutaneous coronary intervention (PCI). Numerous studies highlight that delays in reperfusion directly impact patient outcomes. Even a 30-minute delay from symptom onset to PCI raises the 1-year mortality risk by 7.5% (2–6).Despite significant advancements in emergency cardiac care, the average delay from symptom onset to hospital arrival ranges between 1.5 to 6 hours in many settings (7). A key contributor to this delay is the patient's hesitation or indecision in seeking medical care.

Multiple studies have identified factors influencing prehospital delays in ACS patients. These include inadequate knowledge, misinterpretation of symptoms, emotional responses such as denial or fear, and poor access to emergency services (8-9). Farshidi et al. (10) found that only 35.7% of patients arrived at a medical facility within one hour of symptom onset, while 7.9% delayed for more than 24 hours. Similarly, Goel et al. (11), in a study of 609 myocardial infarction patients, reported that 51.6% delayed seeking medical care by more than six hours, and 14.5% delayed by over 12 hours.

In the Indian context, systemic, logistical, and socio-cultural factors exacerbate these delays. Rural residence, financial constraints, lack of transportation, and low levels of health literacy are frequently cited barriers. George et al. (12), in a study on STEMI patients, reported a median prehospital delay of 4.8 hours, attributing it to lack of awareness, symptom onset at home, and cost-related concerns. Hwang et al. (13) emphasized the influence of lower educational levels on delayed decision-making in seeking care. Misinterpretation of symptoms was also a prominent factor in studies by Momeni et al. (14) and Khan et al. (15-16), alongside inadequate transport infrastructure.

Although international literature has explored this issue in depth, there is limited research from Indian tertiary care settings using standardized instruments such as the Acute Coronary Syndrome Response Index**.** Understanding the patient's knowledge, attitudes, and beliefs using validated tools is essential to develop evidence-based interventions.

This study aims to examine the factors influencing treatment-seeking behaviour among patients diagnosed with ACS at a tertiary care hospital in Chennai. The findings are expected to contribute to the design of tailored educational programs, community awareness initiatives, and improved emergency response strategies to minimize treatment delays and enhance patient outcomes.

Methodology

Research Design

A descriptive cross-sectional design was employed. This allowed the investigator to assess and describe various aspects of ACS patients' treatment-seeking behaviour and knowledge during a single time frame without any manipulation of variables.

Study Setting

The study was conducted in the Cardiology Department of Sri Ramachandra Medical Centre (SRMC), Porur, Chennai**.** The hospital, a 1300-bed tertiary care center, hosts several specialty departments including Cardiology, Neurology, and Nephrology. The cardiology unit consists of several specialized wards such as the Coronary Care Unit (CCU), Cardiothoracic ICU, and Cardiac Care Centre. The data collection took place specifically in cardiac wards like E5, D5, F5, D3, and A5.

Population and Sample

The target population consisted of adult patients diagnosed with Acute Coronary Syndrome. The accessible population included patients transferred from cardiac ICUs and OPDs to cardiac/general wards within SRMC, who met the study’s inclusion criteria.

Sample

The sample included patients aged 18 to 75 years**,** admitted with a confirmed diagnosis of ACS, and who were stable, alert, and oriented at the time of data collection. A purposive sampling techniquewas used to recruit patients during their hospital stay, ensuring relevance to the study objectives.

Sample Size

The sample size of 250 patients was calculated using the StatCalc tool of Epi Info version7.2.2.6, based on an estimated 28.6% prevalence of pain-related reactions in ACS, an odds ratio of 1.91, a significance level of 0.05, and80% power.

Sampling Criteria

Inclusion Criteria

- Patients with medically confirmed ACS based on ECG changes and/or elevated cardiac biomarkers (Troponin T, CK-MB).
- Hemodynamically stable at the time of interview.
- Aged between 18 and 75 years, alert, oriented, and able to give informed consent.
- Free from chest pain/discomfort at the time of data collection.

Exclusion Criteria

- ACS was not the primary reason for hospital admission.
- History of previous ACS episodes.

Data Collection Instruments

Part I: Background Variables

This section included two components:

- **Section A:** Socio-demographic data (age, sex, education, income, marital status, area of residence).
- **Section B:** Clinical information (distance from hospital, diagnosis, treatment received).

Part II: Myocardial Infarction Symptoms Survey (m-RSQ)

A modified version of the Response to Symptoms Questionnaire (m-RSQ) by Dr. Kathleen Dracup was used with permission. It included 13 items assessing:

- Circumstances and location of symptom onset.
- Emotional and behavioral responses.
- Interpretations of symptoms.
- Reactions from people nearby.

This tool used both forced-choice and Likert-type responses to explore perceptions and actions during ACS onset.

Part III: ACS-Response Index

Developed by Dr. Barbara Riegel, this standardized tool assessed knowledge (21 items), attitude (5 items), and beliefs (7 items) regarding ACS symptoms. Permission was obtained for use and modification.

- **Knowledge Subscale**: Consisted of 15 correct ACS symptoms and 6 incorrect (reverse-coded) items. Scores ranged from 0–21.
    - *Scoring*:
        - Adequate (16–21)
        - Moderately adequate (11–15)
        - Inadequate (0–10)
- **Attitude Subscale**: Rated on a 4-point scale from not at all sure *to* very sure. Score range: 5–20.
- **Beliefs Subscale**: Used a 4-point agreement scale with three reverse-coded items. Score range: 7–28. Higher scores reflected more favorable attitudes and beliefs.

Part IV: Cardiovascular Risk Factor Knowledge Questionnaire

This researcher-developed tool assessed knowledge about 17 risk factors (modifiable, non-modifiable, and psychosocial) for cardiovascular disease. Participants rated each factor's impact using a 3-point scale: increases risk, decreases risk, or no effect. Items were scored as correct if the participant accurately identified the role of each factor.

- *Scoring*:
    - Adequate (13-17)
    - Moderately adequate (9-12)
    - Inadequate (0–8)

Pilot Study

A pilot study was carried out from November 10 to 29, 2022, involving 30 patients (10% of sample). It tested the feasibility, language clarity, and applicability of the instruments. The study confirmed the practicality of the tools and data collection procedures. Ethical clearance and administrative permission were obtained prior to the pilot.

Data Collection Procedure

Data collection occurred over four months (January–May 2023). After screening patients for eligibility, informed consent was obtained. Interviews were conducted in Tamil, lasting 20–30 minutes per participant, using structured tools. Each day, 3–4 patients were interviewed in a private, comfortable environment. Participants' confidentiality and privacy were maintained throughout.

Plan for Data Analysis

Data were coded and entered into SPSS version 19.

- **Descriptive statistics** (frequency, percentage, mean, SD) were used to describe variables.
- **Inferential statistics** (independent t-test, ANOVA, Pearson's correlation) were used to examine relationships and associations. A p-value of <0.05 was considered statistically significant.

Ethical Considerations

The study received approval from the Institutional Ethics Committee, SRMC. Permissions were also obtained from the Principal of the College of Nursing, Medical Director, and Head of the Department of Cardiology. Participants were informed about the purpose, benefits, and confidentiality aspects of the study. Written informed consent was obtained. Health education regarding ACS symptom recognition and risk factor modification was provided at the end of the interview.

Results

A total of 250 participants with symptoms of Acute Coronary Syndrome (ACS) were included in the study. The mean age of the participants was 55.23 ± 12.83 years, ranging from 25 to 83 years. More than half (55.2%) were above 55 years of age. A majority were male (81.2%) and married (94%). Regarding residence, 48.4% resided in urban areas, 47.2% in rural, and 4.4% in semi-urban areas. Nearly one-third were illiterate, and only 28% had education above graduation. Concerning income, 40.8% had monthly income between ₹10,000–₹24,999.

Only 29.3% of patients sought treatment within 120 minutes of symptom onset. Half (50.6%) delayed seeking care for more than 8 hours. The average delay was 129.19 minutes, with some taking up to 3624 minutes (over 2 days). The majority (83.6%) reached the hospital with help from family members, and very few (2%) used ambulances.

Pain experience varied, with discomfort (39.6%) and squeezing (35.2%) being the most common. Chest (34%) and shoulder (33.2%) pain were frequently reported. Most symptoms began at home (67.1%), with 48.4% reporting gradual onset. Despite this, only 19.8% had adequate knowledge of ACS symptoms. Around 38.4% misinterpreted symptoms as indigestion. A considerable number of participants perceived the symptoms as moderately or very serious, yet only 8.4% took immediate medication.

In terms of attitudes, participants moderately believed they could recognize ACS symptoms in others or themselves, with a mean score of 12.2 ± 2.92. Beliefs were mixed; though 92.4% agreed chest pain requires immediate attention, cost and embarrassment were deterrents to timely help-seeking.

A statistically significant correlation was found between knowledge of ACS symptoms and knowledge of risk factors (p<0.01). Knowledge was significantly associated with education (p=0.013) and area of residence (p=0.006). Beliefs were significantly associated with timely treatment-seeking (p<0.05), while attitude showed no significant association with demographic variables (Tables 1-3).

Table 1: Distribution of Treatment Seeking Delay Among ACS Patients

Level of Delay	Frequency	Percentage
On time (<2 hrs)	73	29.3%
Slight delay (2–4 hrs)	26	10.0%
Average delay (4–8 hrs)	25	10.0%
Long delay (>8 hrs)	126	50.6%

Table 2: Knowledge Levels Regarding ACS Symptoms (N=250)

Knowledge Level	Frequency	Percentage
Adequate (76–100%)	49	19.8%
Moderately Adequate (51–75%)	106	42.9%
Inadequate (0–50%)	92	37.2%
Mean ± SD	13.95 ± 4.13	

Table 3: Correlation Between Knowledge, Attitude, Belief, and Risk Factor Awareness

Variables	Knowledge	Attitude	Belief	Risk Factors
Knowledge	1	.003	.034	.237 (p=0.000)
Attitude	.003	1	.007	-.095
Belief	.034	.007	1	.047

Discussion

This study assessed the factors influencing treatment-seeking behaviour among patients with Acute Coronary Syndrome (ACS) in a tertiary care hospital in Chennai, focusing on knowledge of symptoms, attitudes, beliefs, and risk factor awareness.

Treatment-Seeking Behaviour and Knowledge of ACS Symptoms

Our study found that 37.2% of participants had inadequate knowledge about ACS symptoms, and only 19.8% demonstrated adequate knowledge (≥75% correct responses). The mean knowledge score was 13.95 ± 4.13, lower than those reported in studies conducted in developed countries (17–19). For instance, O'Brien et al. (17) and Noureddine et al. (18) reported a significantly higher proportion of participants correctly identifying ACS symptoms. This gap could be attributed to differences in health literacy, access to healthcare education, and socio-cultural context.

Only 3.3% of participants answered more than 70% of the questions in the ACS-Response Index knowledge subscale correctly, much lower than the 70% adequacy threshold used in previous studies (17–19). This suggests the need for targeted awareness programs to improve early symptom recognition among patients, especially in low-resource settings.

Attitudes and Beliefs about ACS

The mean attitude score in our study was 12.20 ± 2.92**,** with most participants unsure of their ability to identify symptoms in others or seek help promptly. This aligns with findings from Demisse et al. (20) and Johnson et al. (21), who observed uncertainty among patients in recognizing ACS symptoms and initiating timely action. Our data also suggest a gap in self-efficacy, with less than half of the participants confident in managing ACS symptoms independently, a crucial factor influencing prehospital delay.

Regarding beliefs, the overall mean score was 18.30 ± 2.9. The highest mean response was for the item, *"If I have chest pain that doesn't stop after 15 minutes, I should get to the hospital as soon as possible"* (mean = 3.5), reflecting an understanding of urgency. However, beliefs such as embarrassment about a false alarm (mean = 1.65) were evident, consistent with other studies (21,22). Such beliefs can lead to hesitancy and delays in seeking care during ACS events.

Prehospital Delay and Related Factors

Only 29.3% of participants reached the hospital within 120 minutes of symptom onset, while 50.6% delayed for more than eight hours, and 23.2% sought care after two days. These findings indicate significant prehospital delays, worse than those reported by Mujtaba et al. (23), who found that 33.3% of patients reached the hospital within one hour and 46.25% within six hours.

Several barriers contributed to delays in our study: only 3.9% used ambulance services, most relied on family members (83.6%), and a substantial proportion misinterpreted ACS symptoms as indigestion (38.4%), similar to findings by Panda et al. (24). Gradual symptom onset was noted in 48.4%**,** which may have contributed to delay. Interpretation of symptoms plays a crucial role in determining urgency; in many cases, ACS was not perceived as serious enough for immediate medical attention.

Our results also support earlier findings that a considerable number of patients describe pain in atypical locations such as the arms, back, or shoulder, without reporting classic chest pain (25,26). In this study, discomfort (39.6%), squeezing (35.2%), and pressure were the most common pain descriptors, consistent with the study by Teoh et al. (27).

Correlations Among Knowledge, Attitudes, Beliefs, and Risk Factor Awareness

There was a statistically significant positive correlation between knowledge of ACS symptoms and knowledge of cardiovascular risk factors (ρ = 0.000), similar to findings reported by Garrido et al. (28), who found strong correlations between knowledge and attitudes, beliefs, and perceived risk. These findings highlight the importance of integrated educational interventions that simultaneously address symptom recognition and risk factor awareness.

Associations with Socio-Demographic Variables

Our study found a significant association between knowledge of ACS symptoms and educational status (p = 0.013) and area of residence (p = 0.006), suggesting that people with higher education and urban backgrounds are more likely to recognize ACS symptoms. Though Alfasfos et al. (29) observed an increase in knowledge with higher education, their study did not find the association statistically significant.

Beliefs about ACS were significantly associated with on-time treatment-seeking, emphasizing that perception and cognitive responses to symptoms play a vital role in determining action. Knowledge of risk factors was significantly associated with marital status (p = 0.000)**,** residence (p = 0.010)**,** andfamily income (p = 0.002)**.** Similar findings were reported by Pandey et al. (28), who noted that married individuals accessed outpatient services more frequently and exhibited better health-seeking behaviour.

Limitations

This study has certain limitations. Recall bias may have influenced participant responses regarding the timing and nature of symptoms. As the study was conducted in a private tertiary care hospital**,** findings may not be generalizable to rural or lower-income populations seeking care at government or community health centers. The overrepresentation of rural, low-income patients in a private setting may also affect the interpretation of findings, as their behaviour may differ from the general population with similar socioeconomic profiles.

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