

# Knowledge, Attitudes and Beliefs About Acute Coronary Syndrome Among Patients Diagnosed With Acute Coronary Syndrome, Addis Ababa, Ethiopia

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## Research Article

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# Abstract

**Background.** Acute coronary syndrome (ACS) morbidity and mortality is increasing in low to middle income countries (LMICs) such as Ethiopia. The shift in resources from managing communicable diseases to chronic conditions have brought about formidable health care challenges.

**Objective.** the objective of this study was to examine the knowledge, attitudes and beliefs among ACS patients.

**Methods.** Cross-sectional design was used to enroll participants admitted to one of 3 emergency units (EU) in Addis Ababa, Ethiopia. Knowledge, attitudes and beliefs about ACS was measured using modified ACS response index questionnaires.

**Results.** Participant's (N=330) mean age was  $57.9 \pm 14.1$ , majority male (n= 219, 66.36%). Half of the study participants have inadequate Knowledge (n=147, 44.6%), unfavorable attitudes (n=152, 46 %), and belief (n=153, 46.4%) about ACS symptoms even after being diagnosed and treated in the EU. The most frequently recognized ACS symptoms were chest discomfort (n= 274, 83%), fatigue (n=267, 80.9%) and chest pain (n=266, 80.6%) while Jaw pain (n=101, 30%) neck pain (n=146,44.2%), were less often recognized. Nearly two thirds of the participants (n=214, 65 %) would not prefer to use emergency medical services (EMS) to come to the hospital. Factors associated with adequate knowledge were age < 45 (AOR= 2.16, CI (1.1-4.0) p=0.014), and female sex (AOR= 2.7, CI (1.5-4.4) p= 0.001) and diabetics (AOR=1.9, (1.18-3.0) p= 0.008). Meanwhile, lack of formal education (AOR=6.7, CI (3.1-14) p<0.001) and unemployment (AOR=2.0, CI (1.1-3.8) p=0.021) were associated with unfavorable attitude. In addition, lack of social support (AOR=1.9, (1.17-3.0) p=0.009) and unfavorable attitude (AOR=2.1, CI (1.3-3.4) P=0.001) were significantly associated with unfavorable belief.

**Conclusion.** Despite receiving treatment for ACS in an EU, roughly half of participants did not have adequate knowledge, favorable attitude and belief towards ACS. This elucidates there is significant communication gap between the health care providers and patients. The study findings stipulate there is a need to provide health awareness campaigns using different media outlet with special attention to the uneducated and unemployed groups. Furthermore, most participants were less likely to utilize EMS, which should be further investigated and addressed.

## 1. Introduction

Acute coronary syndrome (ACS) is a range of conditions that occur when there is an abrupt reduction in coronary artery blood flow. It most commonly manifests as unstable angina (UA), ST-segment elevation myocardial infarction (STEMI) or non-ST segment elevation myocardial infarction (NSTEMI) [1]. Although rates of ACS are declining in high income countries, in LMICs they are dramatically rising largely due to urbanization and westernization [2]. Unlike previous reports which indicated that rheumatic heart disease was the most prevalent cause of cardiovascular disease (CVD), coronary heart disease now ranks as the leading cause of morbidity among the Ethiopian population [3]. According to a World Health Organization

(WHO, 2015), an estimated 17.9 million people died from CVD which represents 31% of global deaths, of which 85% were due to an acute myocardial infarction (AMI) or stroke[4]. A recent systematic review on the prevalence of CVD in Ethiopia indicated a 1–20% occurrence [5]. Even though nationwide studies of CVD are limited in Ethiopia, evidence from global burden data in 2017 indicates that CVD is the leading cause of death [3]. Elevated blood pressure, obesity, dyslipidemia, physical inactivity, smoking and substance usage like tobacco were the most common risk factors identified to contribute to CVD in Ethiopia [6–8]. It is known that early detection of ACS symptoms and initiation of reperfusion therapy is associated with a significant reduction in mortality if individuals receive treatment within 3-hours [9]. For patients to seek treatment early, they need to have adequate knowledge, beliefs and attitudes about ACS symptoms. Knowledge of ACS symptoms and risk factors are associated with better attitudes and beliefs towards early treatment [10]. Poor knowledge has been reported to contribute to delayed treatment of ACS [11–14]. Evidence indicates that educational interventions on ACS lead to improved knowledge and earlier treatment for ACS which in turn improves clinical outcomes [10, 15, 16]. Knowledge, attitudes, and beliefs are complex, and independent constructs. Individual's Knowledge refers to the skill of understanding information or facts that is attained through experience or education. An attitude is feeling or opinion someone has while, beliefs is a feeling of certainty about the existence of something [17].

The differences among these constructs are not always clearly defined in the literature and are frequently used interchangeably[18]. Research highlights that prompt receipt of advanced treatment such as percutaneous coronary interventions (PCI) depend on early recognition of ACS symptoms[19, 20]. While numerous studies of ACS symptoms knowledge have been done in middle to high income countries, there are limited data in Africa. The purpose of this study was to examine the knowledge, attitudes, beliefs about ACS symptoms in patients diagnosed with ACS and admitted to one of 3 emergency units in Addis Ababa, Ethiopia.

## 2. Methods

**Design.** Cross-sectional study design was employed to collect data among ACS patient from November 2019 to December 2020.

**Study participants and setting.** Participants who were diagnosed with ACS and had presented within 48–72 hours to the emergency units (EU) of three tertiary care hospitals (two public tertiary and one private hospital) in Addis Ababa, Ethiopia. These hospitals were selected because visited by large volume of cardiac patients, availability of advanced cardiovascular services such as cardiac catheterization and reperfusion therapy [21]. Additionally, these hospitals have a coronary care unit (CCU) for post-surgery ACS patients, intensive care unit (ICU), well-established emergency admission unit and, emergency physician for acute cardiac emergencies.

**Sampling.** All consecutive patients with a diagnosis of ACS and met eligibility criteria were recruited from the EU. The eligibility criteria were: (a) 18 years or older, (b) ability to understand and speak Amharic or English, (c) a confirmed diagnosis of ACS documented in medical records (as evidenced by abnormal

cardiac bio-markers such as elevated cardiac enzyme (Troponin -I Creatine Kinase - MB (CK -MB) or dynamic electrocardiogram (EKG) changes indicative of STEMI, NSTEMI or UA or diagnosed by symptomatology (chest pain, shortness of breath, dizziness, or light headedness), (d) ability to recall the time symptoms started and events prior to hospital admission and, (e) hemodynamically stable as confirmed by stable vital signs, free of chest pain or discomfort at the time of data collection. Exclusion criteria included: (a) cognitive impairment or inability to understand or communicate, (b) major psychiatric disorder, (c) critically ill, (d) mechanically ventilated, (e) terminal illness or (f) multiple diagnoses that complicated symptom recognition. Sample size was estimated using two population proportion formulas using StatCalc of Epi-info version 7.2.2.6 statistical software. To get the representative sample the proportion of acute coronary syndrome who perceived their symptoms as cardiac origin is 28.6% and Odds ratio of 1.91 [12]. Out of 375 invitees, only 330 agreed to participate (88%). The level of significance for statistical analysis was set as 0.05, 95% confidence interval (CI) and power of 0.8 [22].

**Data collection procedure.** Ethical approval was obtained from Institutional Review Board (IRB) (No.078/19/Nursing) of Addis Ababa University, College of Sciences. Data were collected by face-to-face interview and review of participants medical records. Prior data collection written informed consent was obtained from eligible participants and also informed that participation is voluntary and could withdraw any time without any influence on their treatment. Additionally, participants were notified they may not directly benefit from the study, but the information may be useful for other patients with the same condition in the future. Following informed consent data was collected by nurses working in each EU after they received two-days training.

**Data collection instrument.** The modified ACS Response Index questionnaires (ACSRI) were used to measure knowledge, attitudes, and beliefs about ACS [23], and has been widely used in the ACS population. The internal consistency has been documented as 0.81 for knowledge, 0.76 attitudes and 0.74 beliefs [23]. In the current study, internal consistency measurement was 0.76 for knowledge, 0.81 for attitudes and 0.64 for beliefs. The Amharic version ACSRI questionnaire was not previously tested in an Ethiopian population hence, was pilot-tested in 10 patients not include in the study. Knowledge was measured using a dichotomous scale from a list of 15 pre-set questions. Additional six distractor symptoms were also included to determine if participants could identify symptoms that were non-ACS related. The knowledge scale ranges from 0 to 21, with a mean score or higher reflective of adequate knowledge. Attitudes and beliefs were measured using a 4-point Likert scale. The attitudes scale had five items, which documented the patients' attitudes on their ability to recognize symptoms and initiate appropriate help-seeking behavior. The total score ranges from 5–20 (5- indicating poor recognition and less likelihood of activating help while 20-indicating the participant would identify ACS symptoms and promptly seek help). The belief subscale has 5 items that assess the participants beliefs and identifies actions for future ACS symptoms. The scores from this subscale ranges from 5 to 20 with higher scores representing beliefs that they would take action for a future ACS event.

**Data analysis.** Data were entered in to Epi data and exported to STATA version 17.1 statistical package for analysis. The data generated from medical records and self -report were screened for accuracy and completeness. The distribution of continuous data was checked using box-plots and histogram. Descriptive statistics mean  $\pm$  SD (mean and standard deviation) were used for continuous variables or frequency (%) for other variables. The knowledge, attitudes and beliefs score were divided in two group at the (mean score) those participants who scored greater than or equal to the mean were grouped as having adequate knowledge, favorable attitude and beliefs. Assumption of logistic regression was checked for linearity of the logit of dependent variable with continuous independent variable, and multicollinearity. Also, model fitness was assessed prior to data analysis and no major violation was identified. Multiple logistic regression was used to identify the independent predictors of adequate versus inadequate knowledge, favorable versus unfavorable attitudes and beliefs related to socio-demographic, clinical characteristics and psychosocial variables.

## **3. Results**

### **3.1. Demographic characteristics**

Out of three hundred seventy-five participants only 330 agreed to participate (88%, response rate). The mean  $\pm$  SD age of the study participants was  $57 \pm 14$  years and majority were male ( $n = 219, 66.3\%$ ). Most lived in urban areas ( $n = 228, 69\%$ ) and were college/university graduates ( $n = 138, 41.8\%$ ). The sociodemographic characteristics are presented in Table 1.

Table 1  
Socio-demographic characteristics of participants with acute coronary syndrome admitted in selected private and public hospitals of Addis Ababa, Ethiopia from 2019/20 year(n = 330)

<b>Variables</b>	<b>Frequency/mean (SD)</b>	<b>Percent</b>
Age (years)	56 ± 13	
<b>Sex</b>		
Male	219	66.36
Female	111	34.64
<b>Residence</b>		
Urban	228	69.09
Rural	102	30.91
<b>Mode of transport</b>		
Ambulance	49	14.85
non-ambulance	281	85.15
<b>Marital status</b>		
Never married	29	8.79
Ever Married	301	91.21
<b>Education level</b>		
No formal education	80	24.24
Never educated beyond secondary school	112	33.94
College and above	138	41.82
<b>Occupation</b>		
Employed	138	41.82
Unemployed	135	40.91
Retired	57	17.27
<b>Exposure to Mass media</b>		
Television	294	89.09
Radio	144	43.64

### 3.2. Description of knowledge, attitudes and beliefs

**Knowledge:** Participants mean knowledge score was  $14.06 \pm 3.9$  out of a total score of 21. Using mean score as the cut-off value, (n = 183, 55.4%) participants were found to have adequate knowledge. Exploring knowledge of individual ACS symptoms, majority of the participants described chest discomfort /heaviness (83%) as a symptom of a heart attack. Participants incorrectly identified arm paralysis (67.2%), numbness /tingling in the arm (63%), slurred speech (62%), and headache (58%) as ACS symptoms as shown in Table 2.

Table 2  
Correct and incorrect responses of ACS response index questions on individual acute coronary syndrome symptoms (n = 330) of participants admitted at private and public hospital of Addis Ababa, Ethiopia

Symptoms	n (%)
Chest discomfort/heaviness	<b>274 (83.03)</b>
Weakness /Fatigue	<b>267(80.91)</b>
Chest pain pressure/ tightness	<b>266(80.61)</b>
Shortness of breath	261(79.09)
Dizziness /lightheaded	246(74.55)
Arm pain or shoulder pain	238(72.1)
Sweating	234(70.9)
*Arm paralysis	222(67.27)
Numbness /tingling in the arm	209(63.33)
*Slurred / speech	205(62.12)
*Headache	194(58.79)
Heart burn /indigestion / stomach problem	173(52.42)
*Lower abdominal pain	171(51.82)
*Back pain	168(50.91)
*Cough	162(49.09)
Nausea /vomiting	159(48.1)
Loss of consciousness	150(45.45)
Neck pain	146(44.2)
Pale ashen or color change /palpitation /rapid heart rate	134(40.61)
Jaw pain	101(30.6)
Values: frequency (%); symptoms with "*" are distractors symptoms	

**Attitude:** the participants mean score on attitude towards ACS was  $10.0 \pm 2.96$  out of a total of 20. Using the mean score as the cutoff of value, 178 (53.9%) of the participants were found to have favorable attitude. In addition, the majority of participants were little sure of their ability to recognize ACS symptoms (N = 182, 55.1%). Only (n = 104, 31.5%) of participants indicated they were certain they would get help if they experienced future ACS symptoms. (Fig. 1).

**Belief.** the mean belief score was  $11.59 \pm 3.15$  out of total score of 20. Using the mean score as the cut-off value, (177, 53.64%) had favorable beliefs. Forty-four percent (n = 148) of the participants agreed that they would go to a hospital immediately if they were experiencing chest pain even if they were unsure of the origin of the pain. Thirty five percent (n = 116) would prefer for someone to drive them to the hospital rather than using an ambulance Table 3.

Table 3

Participants response on belief subscale of the ACS Response Index who were admitted at selected private and public hospital of Addis Ababa, Ethiopia. (N = 330).

Variable	Strongly agree	Agree	Disagree	Strongly disagree
I would be embarrassed to go to the hospital if I thought I was having a heart attack but not	44(13.33)	94(28.48)	118(35.76)	74(22.42)
If I thought I was having a heart attack, I would wait until I was very sure before going to the hospital	70(21.21)	111(33.64)	90(27.27)	59(17.88)
If I thought I was having a heart attack, I would rather have someone drive me to the hospital than have an ambulance come to my home	112(33.94)	116(35.15)	60(18.18)	42(12.73)
B/C of the cost of medical care, I would want to be absolutely sure I was having a heart attack before going to the hospital.	77(23.33)	111(33.64)	80(24.24)	62(18.79)
If I'm having chest pain and I'm not very sure if it's a heart attack, I should go to the hospital	99(30.00)	148(44.85)	59(17.88)	24(7.27)

### 3.3. Factors associated with knowledge, attitude and belief of ACS symptoms

Multivariable logistic regression was used to identify independent predictors of knowledge level, attitudes and beliefs about ACS.

**Knowledge.** the following predictor variables such as age, gender, place of residence, history of diabetes, family history of premature death and social support were entered into a logistic regression model. However, only age, gender and patient with diabetes were significantly associated with level of

knowledge. Participants with an age less than or equal to 45 years were 2.16 times more likely to have adequate knowledge than those above 56 years age (AOR = 2.16, 95%CI: [1.16, 4.0], p = 0.014). Females were also 2.7 more likely to have an adequate knowledge of ACS than males (AOR = 2.7, 95% CI; [ 1.59, 4.44], p = < 0.001). In addition, participants with diabetes comorbidity were 1.9 times more likely to identify ACS symptoms compared to those with no diabetes (AOR = 1.9, 95% CI; [ 1.18, 3.0], p = 0.008) Table 4a.

**Attitude.** regarding attitudes five predictor variables (education, occupation, exposure to mass media, living arrangement, social support) in the model were statistically significant predictors attitude towards ACS. Those with lower educational levels were 86% less likely to have favorable attitudes towards ACS symptoms (AOR = 0.14 95% CI: [0.06, 0.31], p < 0.001). Unemployed participants were 53% times less likely to have favorable attitudes compare to those employed (AOR = 0.47, 95% CI [0.25, 0.89], p = 0.021). In addition, the odds of a favorable attitude regarding ACS among participants with exposure to mass media was 1.6 times higher than those without media exposure. Those with adequate social support had a 1.76 times more favorable attitude than those who had inadequate social support (AOR = 1.76, 95% CI [1.03, 3.01], p = 0.038). Moreover, participants who reported to live with distant family members were found to have 2.55 times favorable attitudes towards ACS. (AOR = 2.55,95% CI [1.12, 5.83], p = 0.026) Table 4b.

**Belief.** Those who perceived themselves as having good social support were 1.9 more likely to have favorable belief towards ACS symptoms (AOR = 1.9, 95% CI (1.24, 3.16), p = 0.004). Conversely, those participants with unfavorable attitudes score were 55% times more likely to have unfavorable beliefs towards ACS symptoms (AOR = 0.45, 95% CI (0.28, 0. 71), p = 0.001) Table 4c.

Table 4  
Predictors of knowledge, attitude and belief of participants towards acute coronary syndrome

Variables	AOR with (95% CI)	P-value
<b>4a. Knowledge</b>		
Age: <=45years <sup>a</sup>	2.16 (1.16, 4.00)	0.014*
Gender: Female	2.7(1.59, 4.44)	< 0.001***
Diabetes <sup>b</sup>	1.9 (1.18, 3.0)	0.008**
<b>4b. Attitude</b>		
<b>Level of education <sup>c</sup></b>		
Never attend formal education	0.14 (0.06, 0.31)	< 0.001 ***
Primary /secondary education	0.44 (0.24, .81)	0.009**
Occupation <sup>d</sup> : Unemployed	0.47 (0.25, 0.89)	0.021 *
Exposure to mass media: Radio	2.13 (1.23, 3.68)	0.006**
Adequate social support <sup>e</sup>	1.76(1.03, 3.01)	0.038*
Living with others ( <i>non- family</i> ) <sup>f</sup>	2.55(1.12, 5.83)	0.026*
<b>4c. Belief</b>		
Adequate social support	1.96(1.24, 3.16)	0.004*
Unfavorable attitudes <sup>g</sup>	0.45(0.28, 0. .71)	0.001**

AOR; adjusted odds ratio reported; confidence interval in parenthesis; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

<sup>a</sup> Age group compare with < 56 years <sup>b</sup>, Diabetes with non-diabetes, <sup>c</sup> All level of education with college diploma or higher, <sup>d</sup> Employment status un employment compares with Employed, <sup>e</sup> social support adequate with inadequate, <sup>f</sup>Living arrangement live with children with non-family member, <sup>g</sup> attitude favorable versus unfavorable.

## 4. Discussion

Our findings are among the first to describe the knowledge, attitudes and beliefs among Ethiopian patients hospitalized for ACS. The findings showed that slightly more than half of the participants were able to correctly identify some, but not all ACS symptoms which is similar to other reports [24, 25]. Albarquoin et al., 2016 identified that half of the patients (n = 285, 58%) demonstrated high knowledge of ACS and the majority (n = 476, 98%) recognized at least one ACS symptom. In addition, a study that was

conducted in 3 countries (United States, Australia and New Zealand) also reported comparable results with 56% of participants having adequate knowledge of ACS symptoms [25]. An Irish study (n = 964, 49.5%) demonstrated a slightly lower level of ACS knowledge compared with the present study but the majority were able to recognize chest pain/pressure as a symptom (98.9%) [10]. Similarly, in the present study most participants identified chest discomfort/ heaviness (83.6%) as a symptom of ACS. Conversely, a Pakistan study reported that 81% of 720 participants failed to recognize symptoms and only 6% were able to identify one or more symptoms of ACS [26]. This finding was also supported by Nouredine et.al, 2020 where only 13 out of 50 participants scored greater than 70% in the knowledge questions. However, greater than 85% recognized typical symptoms such as chest pain and sweating [27]. Suboptimal knowledge related to cardiovascular disease was also reported by Negesa et al., (n = 132, 46%) from Ethiopia[28]. The result is slightly lower than the report from the current study. Based on the literature, we found considerable variability concerning the identification of ACS symptom knowledge. There are several potential explanations including differences in study settings, socioeconomic status, health literacy level and the level of exposure to mass media campaigns. Unlike previous studies in LMICs that showed males were more likely to be knowledgeable about ACS symptoms [29–33]. our findings showed that females to be more knowledgeable and is supported by studies conducted in high income countries [25]. The reason for these differences is unclear but may reflect that more highly educated women are living in urban areas such as Addis Ababa and may not reflect women in the general population in Ethiopia. Additional explanations may be that most Ethiopian women are housewives and have a greater opportunity to be exposed to media. Culturally, Ethiopian women are primarily responsible for providing information on health-related issues concerning their family and may have greater interest from this perspective. Other demographic characteristics that predicted ACS knowledge included younger age < 45 years which is supported by several studies conducted in LMICs [34, 35]. From a clinical perspective, diabetic participants were more likely to be knowledgeable about ACS and is supported by several LMIC studies [36]. Conversely, in study elsewhere diabetic patients identified as having lower knowledge of ACS symptoms [37].

Diabetes self-management is complex, and patients are more likely to experience atypical ACS symptoms which can potentially result in poor symptom recognition as other studies have reported [38]. Our findings showed that participants had unfavorable attitudes and beliefs about ACS symptoms. Compared to the report from Jordan by Alfasfos and colleagues (2016), our study participants had slightly lower mean attitude scores (10 vs 11.5) [39]. Similarly, the finding on the mean belief score was much lower than reported elsewhere [27, 39]. The reasons for these differences are unclear, but may reflect dissimilarity in health care provisions, accessibility and educational level.

According to the European society of cardiology guidelines, patients with ACS symptoms should call the emergency medical system (EMS) or seek treatment as soon as possible, [40] ideally within 10-minutes of symptom onset to reduce morbidity and mortality. It is estimated that for every 1-minute delay to treatment, there is an 2% increase in mortality[41]. Use of EMS is an essential service that has been shown to reduce delay in ACS treatment in LMICs [42]. In the present study, the majority preferred for someone to drive them to the hospital rather than have EMS come to their home. This may be due to a

lack of awareness about the existing prehospital system, limited access and fear of delays in transport. In Ethiopia, EMS is underdeveloped and limited to major cities, and individuals are required to pay out of pocket, with no insurance coverage which may further limit accessibility. Currently, there is no coordinated dispatch center in Ethiopia for EMS, the ministry of health however, in collaboration with major urban cities are trying to establish the centers to better support cardiac care in the country [43, 44]. Participants who were exposed to mass media and had adequate social support, had favorable attitudes and beliefs about ACS. This finding clearly identifies exposure to media as a good source for acquiring knowledge about ACS in Ethiopia and needs to be utilized more prominently. This is supported by evidence which identified mass media for enhancing public health education on a variety of topics[45]. An intervention study using mass-media also demonstrated that this format was able to improve knowledge, attitude and beliefs towards ACS in Ireland [10]. Mass media campaigns using radio/television are essential to improve public awareness about ACS, its causes and what actions to take when symptoms occur.

### **Strengths**

This study was unique by examining knowledge, attitudes and beliefs from currently admitted ED patients diagnosed with ACS. To our knowledge, this is the first study to examine these factors in Ethiopia and provides evidence for the need to implement a national ACS public awareness campaign to reduce future morbidity and mortality. The ACS response Index had adequate psychometric properties instrument and was successfully back translated and used in an Ethiopian population. It will be possible to use this instrument in other segments of the Ethiopian population to compare differences and similarities in knowledge, attitudes and beliefs about ACS. Approximately 35% were female in the study which is much higher than in most LMICs examining ACS. Additionally, the study conducted in tertiary care center is visited by every single Ethiopian patient with CVD from each corner of the country which increases external validity of the study.

### **Limitations**

The cross-sectional design was a limitation since we were not able to follow patients and outcomes over time. In addition, recall bias may have occurred which could potentially alter study findings. Participants were provided with a list of ACS symptoms in the EU by their treating physician which may have altered their responses and led to an overestimation of knowledge. Since participants are from the private and Tertiary care hospitals and were in an urban setting, the results may not be generalizable to community hospitals in rural geographic locations and might not reflect the general Ethiopian community. Many of our study participants were well educated and high in socioeconomic status, particularly among those who used a private hospital which may have also influenced their responses and may not represent others who are lower in socioeconomic status. Finally, our study population had access to cardiologists and equipped to take care of ACS, many hospitals in Ethiopia do not have staff or hospitals that have the capacity to care for cardiac emergencies.

## **5. Conclusion**

Our findings suggest, despite receiving treatment for ACS in an ED, roughly half of participants have inadequate knowledge, attitude and belief towards ACS symptoms. The study finding elucidates the overall all poor health literacy coupled with significant communication gap between the treating health care providers in EU and patients. Contrary to international ACS treatment guidelines, most of our participants did not prefer to use EMS for transport which should be further investigated and addressed. Therefore, our finding showed there is a need to provide health awareness campaigns using different media outlets, focusing on high-risk groups to improve the knowledge attitude and belief of participants towards ACS symptoms. Future large-scale research is also needed to further understand the problem and address the observed gaps.

## **Declarations**

### **Ethics approval and consent to participate**

Ethical approval was obtained from Institutional Review Board (IRB) of Addis Ababa University, College of Health Sciences with IRB grant reference number of (No.078/19/Nursing). The purpose, general content and nature of the study was explained in the language preferred by the study participant and informed consent was obtained from all participant prior to the data collection. The participants were informed that they had the right to be involved or refuse to participate in the study and the right to withdraw from the study at any time during the interview. They were also assured that the data would be handled exclusively by the investigators and used only for the purpose of the study. In addition, the confidentiality of the information obtained from each participant was maintained. Moreover, all procedures involved in this study have adhered to the principles of the Helsinki Declaration.

### **Consent for publication**

Not applicable

### **Availability of data and materials**

The datasets generated and/or analyzed during the current study are not publicly available as public data sharing was not approved by IRB but are available from the corresponding author on reasonable request.

### **Competing interest**

The authors declare they have no competing interest to report.

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### **Authors contribution**

LB (principal investigator) made considerable contribution to conception, design, data analysis and interpretation, drafting of the manuscript and review. RG assisted with design, and critical review of the drafted manuscript, BA assisted, inception, design, review drafted manuscript review, AA assisted in review of drafted manuscript, All the authors read and endorsed the final manuscript.

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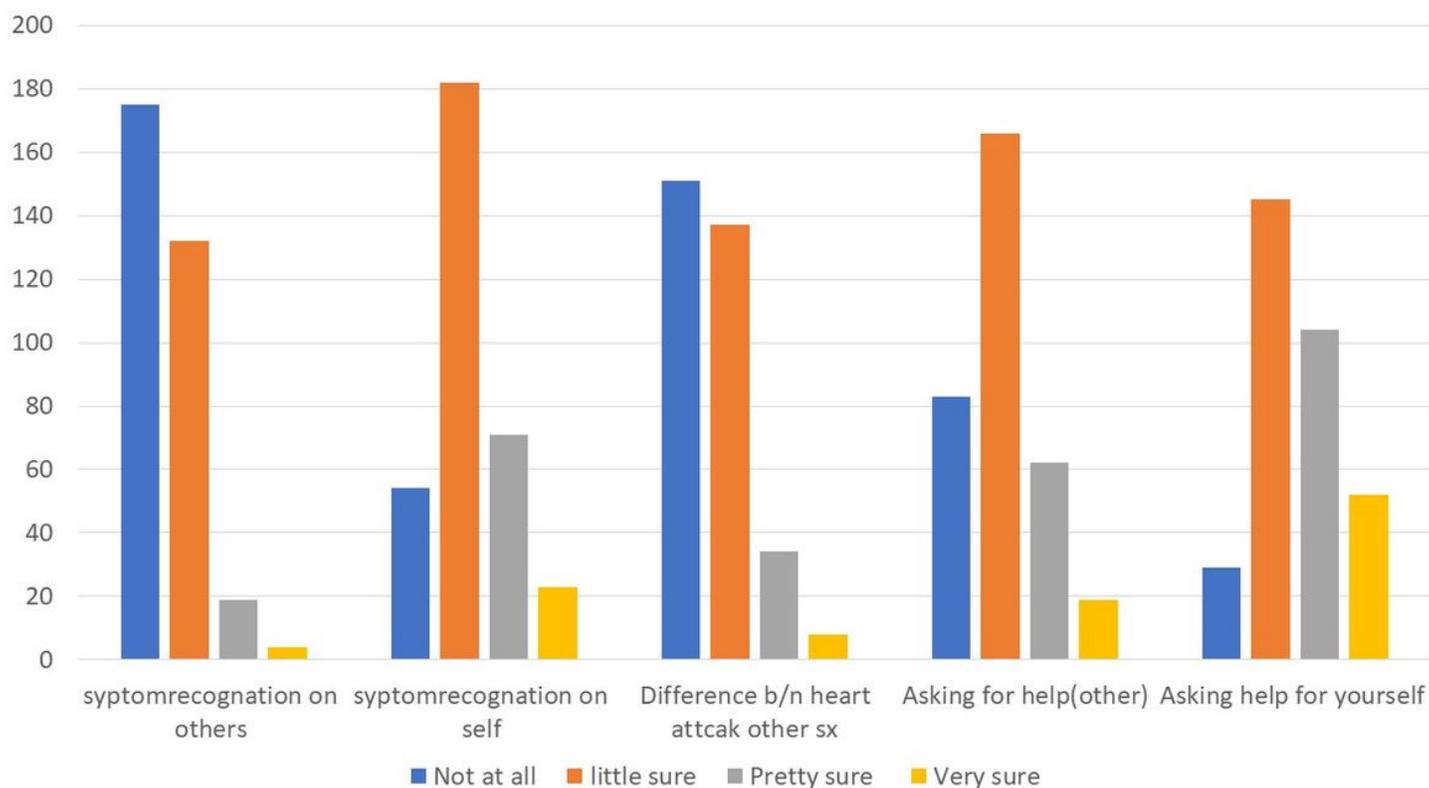
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## Figures



**Figure 1**

Participant's response on attitude sub scale of the ACS Response Index who were admitted at selected private and public hospital of Addis Ababa, Ethiopia