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Effects of the COVID-19 Pandemic on Emergency Department Triage Nurses' Response to Patients With Potential Acute Coronary Syndrome

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Abstract

Background: The COVID-19 pandemic added challenges to patient assessment and triage in the emergency department (ED).

Objective: To describe the effects of the COVID-19 pandemic on ED triage nurse decisions for patients with potential ACS.

Methods: This was a secondary analysis of data from a descriptive, electronic, survey-based study. Participants were asked two questions: whether the COVID-19 pandemic had affected their triage and/or assessment practices for patients with potential ACS and if so, how. Descriptive statistics were used to compare characteristics of participants. A qualitative descriptive approach was used to analyze responses to the open-ended questions about the pandemic's effect on the triage process.

Results: Participants from across the US had a mean age of 41.7 (12.3) years; 358 (80.6%) were women. The participants had a median of 10.0 (IQR 16.0) years of experience as a registered nurse, with a median 7.0 (IQR 11.0) years of ED experience. A total of 180 of 444 (40.5%) participants indicated that the COVID-19 pandemic affected their triage processes and assessment of potential ACS patients; 156 (86.7%) provided a response to the open-ended question. Responses revealed four themes, 1) Delays in Triage and Treatment; 2) Ambiguous Patient Presentation; 3) Heightened Awareness of COVID-19 Complications and Sequalae; and 4) Process Changes.

Conclusions: Forty percent of ED triage nurses participating reported that triage processes for patients with potential ACS were affected by the COVID-19 pandemic. Most expressed barriers that resulted in delayed assessment and treatment of patients and often resulted from overlapping cardiac symptoms and COVID-19.

Keywords: Triage; nurses; emergency department; acute coronary syndrome; COVID-19

Introduction

The COVID-19 pandemic created a global health crisis, and emergency department (ED) nurses were routinely challenged, emotionally and physically[1,2]. Emergency department staff were required to redesign their care delivery systems and workflow to meet the demands of patient screening and prevention of COVID-19 spread[3-5], often leading to delays in care[6].

About 1.2 million patients are diagnosed with acute coronary syndrome (ACS) annually[7]. Acute coronary syndrome includes unstable angina, non-ST-elevation myocardial infarction (NSTEMI), and ST-elevation myocardial infarction (STEMI). This time-sensitive condition requires early identification and treatment, to support positive patient outcomes, including reduced morbidity and mortality[8,9].

Nurses are typically responsible for identifying patients with ACS through their initial assessments and triage decisions[10-12]. Nurses also play a pivotal role in ensuring patients receive timely 12-lead electrocardiograms (ECG)[11,13]. Practice guidelines[8,9] state that a 12-lead ECG should be obtained and interpreted within 10 minutes of a patient presenting with ACS. Moreover, patients experiencing STEMI should receive primary percutaneous coronary intervention within 120 minutes[14].

To determine if patients are experiencing ACS, nurses consider several factors, including patient symptoms, medical history, and demographics, along with their own perceptions and beliefs[10,15]. Symptoms serve as important cues, and two of the most common symptoms of ACS include chest pain and shortness of breath[16,17]. Nearly 6 million patients present to the ED with a report of chest pain, and over 1.5 million present with dyspnea or other respiratory abnormalities annually[18]. While these symptoms are common with ACS, they are also common in COVID-19, adding complexity to patient assessment and triage.

Purpose and Research Question

The aims were to (1) determine the proportion of ED nurses that felt the COVID-19 pandemic changed triage practices for acute cardiovascular problems in the ED and (2) to describe the effects that the COVID-19 pandemic had on ED nurses' triage of patients with possible ACS.

Methods

Design, Sample, and Setting

We conducted a secondary analysis of data from a larger study exploring ED nurses' knowledge of ACS symptoms and nurses' triage/prioritization decisions for patients presenting with ACS symptoms. The parent study was a descriptive, electronic survey-based design. The present paper incorporates quantitative and qualitative analytic approaches to examine the open-ended questions. The study was deemed exempt by the **Blinded for Peer Review** Institutional Review Board (IRB-2021-177) of the sponsoring institution. Participants were eligible if they were: 1) a registered nurse, 2) worked at least part-time in an ED, 3) able to complete the online survey, and 4) able to speak, read, and write in English. Participants were recruited using three approaches. In early 2022, the survey was posted on the Emergency Nurses Association (ENA) website. In March 2022, 18,000 postcards were mailed to a stratified random sample of members of the ENA, based on the number of ENA members in each region (i.e., regions with a larger number of members received more postcards than those with fewer members). Additionally, participants were encouraged to invite other ED nurses to participate in the study.

Measures

An anonymous survey using the Qualtrics platform was used. Theoretically relevant sociodemographic characteristics of participants and their location of practice were assessed since these variables could have affected the nurses' triage and assessment processes. We asked participants to indicate in a dichotomous (yes/no) fashion whether they thought the COVID-19 pandemic had affected their triage and/or assessment practices for patients with possible ACS. If participants indicated "yes," then an open-ended question was presented: "Please explain how the COVID-19 pandemic has affected the way that you assess and/or triage patients with potential cardiac problems, like ACS."

Procedures

Participants were able to access the survey via at link on the ENA website, by typing in the URL address located on the postcard and website, or by scanning a QR code on the postcard. A waiver of documentation of informed consent was granted by the Institutional Review Board, and completion of the survey implied consent. After completing the anonymous survey, participants had the option to enter a random drawing for one of fifty $20 electronic Amazon gift cards.

Data Analysis

Data were downloaded from Qualtrics into SPSS 28.0 (IBM Corp., Armonk, NY). Data were cleaned and inspected. A total of 449 surveys were received. Five participants were not included in the analysis. One participant had more than 50% missing data, and four participants did not answer the question asking whether the COVID-19 pandemic affected their triage or assessment of patients with potential ACS yielding a final sample of 444 participants.

Descriptive statistics were calculated to characterize the participants and locations in which they practiced. Chi-square tests, independent-samples *t*-tests, and Mann-Whitney U tests

were used to compare the sociodemographic characteristics of participants who indicated that the COVID-19 pandemic affected their triage or assessment of potential ACS patients with those who reported that the pandemic did not have an effect.

A qualitative descriptive approach, as described by Sandelowski,[19,20] was used to analyze responses to the open-ended question about the pandemic's effect on the triage and assessment of patients with potential ACS. Given that data were collected from an online survey, we focused on analyzing the *manifest* content of each open-ended response. We did not attempt to identify the *latent* meaning behind statements. The focus was on actual statements and words used by participants. To identify overall categories of responses to this open-ended question, two authors (X.X. and X.Y.) independently applied first-cycle codes, focusing on descriptive and emotion codes[21]. After this first round of coding, the two authors met virtually to discuss their codes. The authors then mutually collapsed some of the first-cycle codes into second-cycle codes[21]. Counting and clustering of the data were done to identify the common second-cycle codes from the data, representing the key categories of responses. We also reviewed demographic and health system variables (e.g., years of experience in the ED, certification as an ED nurse, ED size) to identify any potential differences in open-ended responses.

Results

Participant Characteristics

Seventy-four percent of participants were recruited via postcard. The response rate to postcard recruitment was 1.8%; it was not possible to calculate a response rate for the other recruitment methods. Participants had a mean age of 41.7 (12.3) years and 358 (80.6%) were women. The participants had a median of 10.0 (IQR 16.0) years of experience as a registered nurse, with a median 7.0 (IQR 11.0) years of ED experience. Most (59.9%) held baccalaureate

degrees in nursing and worked as a staff nurse (n = 236, 53.2%) or charge nurse (n = 135, 30.4%), and 214 (48.2%) were certified in emergency nursing. Participants were located across the United States, with 41.9% located in the Midwestern U.S. They reported working at EDs that were diverse in size, and 244 (55.0%) of the participants reported that their facility was a Certified Chest Pain Center.

Proportion of Participants Endorsing a Change in Triage or Assessment Practices

Of the 444 participants, 180 (40.5%) indicated that the COVID-19 pandemic affected their triage or assessment of patients with potential ACS. There were no statistically significant differences in demographic characteristics between nurses who indicated that the COVID-19 pandemic affected their triage or assessment of patients with potential ACS and those who did not (Table 1).

Effect of COVID-19 on Triage Practices

Of the 180 participants who indicated that the COVID-19 pandemic affected their triage or assessment of patients with potential ACS, 156 (86.7%) provided a response to the open-ended question. Responses revealed four themes: 1) Delays in Triage and Treatment, 2) Ambiguous Patient Presentation, 3) Heightened Awareness of COVID-19 Complications and Sequalae, and 4) Process Changes. These four themes are illustrated in Figure 1 and detailed in the remainder of the results. We did not observe differences in open-ended responses based on demographic and health system characteristics, such as ED size and years of ED experience. A key message, as noted by one participant, was that the pandemic "changed everything."

Delays in Triage and Treatment

Delay in processing patients was the most prevalent response to a change in practice. A plurality (n = 68, 43.6%) of the participants who answered the open-ended question used the

term "delay." Delay in overall triage times (n = 22, 14.1%) and not being able to obtain a 12-lead ECG within 10 minutes (21, 13.5%) were reported. Other respondents did not specify aspects of care that were delayed.

Delay Due to Process Changes. Participants often noted that the process changes necessitated by the pandemic led to delays in processing patients. Specific precautionary measures for COVID-19, including the use of personal protective equipment (PPE) were noted by 13 (8.3%) of participants. One participant noted that there was *"Delayed patient care due to the extra PPE needed."* Another participant added that it, *"takes longer to triage them if we need to be in all precautions… takes longer to get an EKG, almost never within 10 minutes."*

Twenty-two (14.1%) of the respondents explicitly stated that patient screening for COVID-19 symptoms, COVID testing, and/or or patients who had tested positive for COVID-19 led to delays in treatment. One participant stated, *"treatment has been delayed due to needing results from their COVID test. If COVID result is positive, other interventions need to be implemented, delaying care."* Another participant commented that, *"Patients are placed in isolation right away. It might delay the EKG. We have been so focused on COVID-19 symptoms and isolating these patients…*" Another noted that the COVID screening process for walk-ins was detrimental to the overall recognition of ACS symptoms stating: *"Due to COVID-19 screening requirements for 'walk-ins,' … there can be a delay in an ACS patient getting to the triage process and cardiac protocol being initiated."*

Process changes within the electronic health record (EHR) also led to delays with participants mentioning the cumbersome screening questions delaying the cardiac assessment. One participant noted, *"It has slowed down the triage process by having our EHR triage process ask far too many irrelevant questions about COVID and prevents me from moving rapidly*

through the triage section to be able to place EKG/standing chest pain orders." Other participants stated that cleaning protocols affected the triage process. A participant reported that they, *"have to take time to clean triage"* after a patient with any *"cold symptoms"* are seen.

Delay Due to a Lack of Resources and Patient Volumes. A lack of physical and human resources for increased patient volumes were noted by 23 (14.7%) participants. The most common comments related to the overwhelming number of patients crowding the ED. One participant commented that there have been, *"too many patients with not enough staff."* Another participant reported that, *"We are so overrun with patients, it's hard to do a full triage. We do quick shorts now and try to do our best to get people seen in (sic) EKGs within 10 minutes. There is a great nursing shortage and way too many patients."* Others noted limited physical space and room availability reducing prompt triage and care: *"We don't have rooms or staff available…Care is delayed, time to room is delayed, time to see a physician is delayed. Patients sit out in the waiting room for hours with positive troponins and cardiac symptoms."*

Ambiguous Patient Presentation

Over one third of participants (n = 57, 36.5%) who answered the open-ended question made a comment about patient presentation being ambiguous. Participants often had difficulty discerning whether symptoms were associated with a cardiovascular problem, COVID-19, or both. While some participants stated that COVID-19 and cardiac patients are similar, 46 of the 57 (80.7%) specifically mentioned the term "symptoms" or listed specific symptoms that are common with COVID-19 and acute cardiovascular problems, especially chest pain and shortness of breath. One participant noted that *"It has blurred the lines of ACS and COVID symptoms,"* while another reported that *"Patients with COVID do have similar symptoms, such as chest pain, shortness of breath, fatigue, weak."* Participants noted that this ambiguous presentation has

altered their thinking about potential cues for ACS. One participant noted that, *"The cues I normally use, such as chest pain, shortness of air, fatigue, have become standard complaints of most patients because they are similar symptoms for COVID."* While participants are not discounting the possibility of ACS, they are having to consider COVID as a possible and more common problem, noting that *"COVID is now another differential diagnosis to add on."* Others have had to *"look at other symptoms such as fever*" that might favor one diagnosis over another.

Heightened Awareness of Co-Occurring Complications and COVID-19 Sequalae

Participants (n = 32, 20.5%) reported being more alert for problems co-occurring with COVID-19, as well as sequalae of COVID-19. Specifically, participants mentioned atrial fibrillation, ACS, pulmonary embolism (PE), myocarditis, and pericarditis as conditions for which they are more attuned in the triage process. Participants noted that because of COVID-19, there is a *"higher potential for ischemic events to occur*" and that they have *"seen an increase in PEs presenting with shortness of breath and chest discomfort/fatigue*." Some mentioned that they *"are more wary of potential cardiac problems post-COVID"* because of the *"increases in clotting associated with COVID."* Another participant commented that *"COVID and post-COVID patients are at higher risk for clot, afib heart rhythm, and decreased EF. These patients grab my attention with their symptoms more so than before."*

This heightened awareness of complications was particularly emphasized for younger patients, with eight participants specifically noting that they are alert to clotting issues and cardiovascular problems in younger patients because of COVID-19. One participant stated that they have seen *"younger people getting blood clots,"* while another reported that COVID has *"increased my suspicion for ACS in younger patient populations without history of risk factors*." Another participant noted that they have seen *"younger patients presenting much sicker and with*

worse cardiac symptoms because of COVID." Because of the increased number of younger people presenting with potential cardiovascular problems, participants have conducted and/or observed more in-depth assessments and diagnostic workups. One participant stated that they are seeing a *"much higher volume of younger people having chest pain, so our MDs tend to want more in-depth workups on these patients*."

Process Changes

While participants often associated process changes with delay as noted earlier, some participants (n = 29, 18.6%) mentioned process changes without commenting on associated delay. These changes may have actually reduced delay in triage and prompt associated actions, such as obtaining a provider-read 12-lead ECG within 10 minutes of patient arrival.

Changes in Patient Flow and Procedures. Several participants noted that changes were made to their patient flow and procedures due to COVID-19. Participants often noted that 12-lead ECGs were obtained in different locations and that triage was performed in different locations. One participant stated that instead of rooming patients with cardiovascular complaints immediately, they would obtain an "*EKG at triage, draw labs, and hold them in the waiting room*." Another participant stated that, *"Crowding/boarding has led to more extensive diagnostic evaluation at triage (i.e., EKG, labs), prior to rooming, to use scarce resources more efficiently. Low suspicion/risk patients would typically be roomed quickly…but through the pandemic, we have completed entire chest pain workups from the waiting room."* Similarly, one participant with 21 years of ED nursing experience stated that, *"I have taken care of NSTEMI patients in the lobby more than ever in my career."* Another participant noted that routine workups for cardiac complaints were started in the waiting room, stating, *"Often we send them back out to the waiting room and start orders (EKG, blood draw) while they are waiting for an open room."*

Interestingly, one participant also suggested that more 12-lead ECGs have been performed, commenting, *"COVID patients can experience 'cardiac symptoms' such as chest pain . . . but they may not be ACS. Therefore, I'd say more EKGs have been ordered immediately while triaging."*

Changes in Assessment and Monitoring of Patients. Participants commented that their assessment and ongoing monitoring of patients was affected by COVID-19. At times, the physical location of patients created difficulty: *"Sometimes people had to wait in their cars, so it was harder to assess."* Other times, precautions, such as masks, created more difficulty as noted by one participant who stated, *"The wearing of masks has reduced my ability to truly see facial cues and to work closely with the patient and family."* Another added that *"Masks made hearing the patient difficult."* For some participants, the overall triage and assessment process changed. One participant reported that *"due to the volume of patients, triage is now a two-step triage process, one asking the chief complaint and getting an EKG, and the second set would be a little bit more in depth triage process."* Because of the personal safety concerns that COVID-19 caused, a few participants reported that previously standard assessment techniques, such as auscultation, were not being used: "*The whole time, if you looked around the ER, no one had a stethoscope on and assessments were done as far away as possible (even on the phone at times by the physicians)."* Because of a lack of beds and available monitors, patients with potential ACS who would normally have been placed on ECG and vital sign monitors did not receive this monitoring. Participants noted that patients were *"off monitor at times"* and "*not monitored for long periods of time"* and that they were *"having to put them in non-telemetry monitored beds*.

Discussion

Key findings from the study were that a minority of ED triage nurses said that COVID-19 had changed their practice. Of the 40.5% who said their practice changed, four themes emerged: 1) Delays in Triage and Treatment, 2) Ambiguous Patient Presentation, 3) Heightened Awareness of COVID-19 Complications and Sequalae, and 4) Process Changes.

Delays in Triage and Treatment

An increase in patient volume, overlapping symptoms between COVID-19 and ACS, and a shortage of staff noted by participants, undoubtedly led to delays in treatment, as noted by some participants. COVID-19 and ACS have significant symptom overlap causing many participants to express challenges with making a differential diagnosis thus delaying care[22]. The COVID-19 pandemic compelled EDs across the country to reconsider how to effectively provide care to a dramatically increased number of infectious individuals while continuing to care for emergencies, such as ACS. Many participants in this study focused on the delays in definitive treatment caused by the pandemic. McLaren et al.[6] found that both door to ECG and door to cardiac catheterization lab activation time increased significantly during the first wave of the pandemic but normalized during the second wave.

Ambiguous Patient Presentation

Our findings of respondents reporting overlapping symptoms between ACS and COVID-19 have been reported in the literature. Garcia[22] reported that presenting signs and symptoms including dyspnea, hypoxia, cough, pulmonary infiltrates, and chest pain could lead to missed or delayed diagnoses and complications. Braiteh et al.[23] found that there was a 40.7% reduction in ED admissions for ACS in New York from March 2019 to March 2020. The authors suggested that patient hesitancy may have been due to misdiagnosis of ACS since patients can present with cough and shortness of breath due to pulmonary edema similar to COVID-19 presentations. As

COVID-19 becomes endemic, it is likely that triage nurses will continue to have challenges in discriminating between COVID-19 and ACS.

Heightened Awareness of COVID-19 Complications and Sequalae

Long COVID (or long haul) is defined as individuals who have recovered from COVID-19 infection and experience persistent symptoms, complications, and other disorders[24]. The literature supports the heightened awareness of our participants to the sequalae associated with Long COVID. For example, in a review of 65 studies, SeyedAlinaghi[25] found 10 potential late complications of COVID-19 including, lung injuries (n=31), venous/arterial thrombosis (n=28), heart injuries (n=26), cardiac/brain stroke (n=23), and neurological injuries (n=20) are the most frequent late complications of COVID-19. Yang et al.[26] noted that complications affecting the cardiovascular system are the most serious with the highest mortality rates. Our participants noted long-term complications of COVID-19 infection such as hypercoagulable states, fatigue, atrial fibrillation, and neurologic symptoms and stated they were increasingly common. Participants also took note of the increased risk in younger people noting that screening for prior COVID-19 recovery is also part of their triage assessment to determine if long-COVID-19 complications are present.

Process Changes

Findings from McLaren et al.[6] confirm the ability of ED staff members to adapt to process changes during COVID-19. Many participants in this study seemed focused on the resulting challenges and barriers to care, but one participant did note "*things are better now."* Others discussed how process changes allowed them to continue providing timely care. The focus on barriers to care may be partially due to the timing of the study. Data were collected in early 2022, following wide availability of vaccines and during a time of stabilization in COVID-

19 case numbers. It is possible that many nurses answered questions based on experiences from a surge of cases in December 2021 and January 2022.

Since spring of 2020, EDs made significant changes to avoid viral transmission of COVID-19 and changed processes to keep both staff and patients safe. Ponsford and colleagues[5] describe significant changes to patient flow, screening, and triage to ensure safety of staff and patients. Changes included strict triaging to reduce exposure to staff with screening for COVID-19 superseding medical stability. Given the changes described in the literature, it was surprising that just over 40% of nurses in our sample felt that triage was impacted. It is possible that while the ED triage process has changed due to new policies, new procedures and high patient volumes, the nurses' overall mindset and goals of triage for ACS has not. Therefore, when asked whether the COVID-19 pandemic affected their triage and/or assessment practices related to patients with possible ACS, the answer was no – their triage and assessment had not changed even if the hospital processes had changed.

Strengths and Limitations

This survey was drawn from a national sample of ED nurses. As with all survey research, response biases are possible, including social desirability bias. However, we emphasized the anonymous nature of the survey to encourage open and truthful responses. The low response rate may have led to non-response bias, though multiple demographic variables were collected to clearly characterize the sample and evaluate potential response differences. The sample was principally drawn from a professional nursing organization, the ENA; the fact that many respondents were members of a professional organization may reflect their engagement with the nursing profession and professional practice and may not reflect the beliefs of all ED nurses. Additionally, the COVID-19 pandemic has affected different regions of the U.S. with a higher

intensity at various times. Thus, responses may reflect regional difference in the pandemic experience. However, survey responses were primarily received in March and April 2022, a time when the U.S. overall was seeing a significant decline and stabilization in cases following the Omicron wave of late 2021 and early 2022. Almost half of participants were from the Midwest, so responses may be more representative of the Midwestern U.S. experience. However, we did not identify statistically significant differences in outcome variables based on ENA region, indicating that there were not significant variations in responses based on geographical region. Finally, because we asked participants to discuss how the pandemic has affected triage for patients with "potential cardiac problems like ACS," participants may have been thinking about multiple cardiac diagnoses, including but not limited to ACS. Had we specified only ACS in the question, responses may have been more limited and focused on ACS.

Recommendations for Future Research

A mixed methods study comparing ED nurses' personal perceptions and patient diagnoses, presentation characteristics, diagnostic procedures, and outcomes would be useful. Understanding ways to mitigate 12-lead ECG delay times would be helpful to speed diagnoses.

In-depth interviews with ED nurses and providers would be beneficial to better understand their experiences during the COVID-19 pandemic. The COVID-19 pandemic impacted not only triage decision making, but also many other aspects of nursing and patient care. Recognizing how that impacted nurses and providers initially and currently, as COVID-19 becomes endemic, may help researchers better understand the burnout being experienced and the resignation of nurses around the country.

Conclusion

Just over 40% of nurses surveyed reported that COVID-19 impacted their triage decision-making for patients with potential ACS. Process changes were frequent, often leading to delay, and the ambiguous symptom presentation of many patients added a layer of complexity to the ED triage and assessment process. Better understanding the pandemic's effects on the triage of patients with potential ACS can bolster the healthcare system's preparations for future pandemics.

References

1. Lin CH, Siao SF, Lin YJ, Hsin PH, Shelley M, Lee YH. Cognitive appraisals and coping strategies of registered nurses in the emergency department combating COVID-19: A scoping review. *J Nurs Scholarsh.* 2022.

2. Sullivan D, Sullivan V, Weatherspoon D, Frazer C. Comparison of Nurse Burnout, before and during the COVID-19 Pandemic. *Nursing Clinics.* 2022;57(1):79-99.

3. Karalius VP, Kaskar SB, Levine DA, Darling TA, Loftus TM, McCarthy DM. Emergency Department Patient Experiences During the COVID-19 Pandemic. *Journal of Patient Experience.* 2021;8:23743735211033752.

4. McManus NM, Offman R, Oetman JD. Emergency Department Management of COVID-19: An Evidence-Based Approach. *West J Emerg Med.* 2020;21(6):32.

5. Ponsford LR, Weaver MA, Potter M. Best Practices Identified in an Academic Hospital Emergency Department to Reduce Transmission of COVID-19. *Adv Emerg Nurs J.* 2021;43(4):355.

6. McLaren JT, Taher AK, Chartier LB. Flattening the other curve: Reducing emergency department STEMI delays during the COVID-19 pandemic. *The American journal of emergency medicine.* 2021;49:367-372.

7. Tsao CW, Aday AW, Almarzooq ZI, et al. Heart disease and stroke statistics—2022 update: a report from the American Heart Association. *Circulation.* 2022;145(8):e153-e639.

8. Amsterdam EA, Wenger NK, Brindis RG, et al. 2014 AHA/ACC guideline for the management of patients with non–ST-elevation acute coronary syndromes: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation.* 2014;130(25):2354-2394.

9. O'Gara PT, Kushner FG, Ascheim DD, et al. 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol.* 2013;61(4):e78-e140.

10. Arslanian-Engoren C, Hagerty BM. The development and testing of the nurses' cardiac triage instrument. *Res Theory Nurs Pract.* 2013;27(1):9-18.

11. Chhabra S, Eagles D, Kwok ES, Perry JJ. Interventions to reduce emergency department door-to-electrocardiogram times: a systematic review. *Canadian Journal of Emergency Medicine.* 2019;21(5):607-617.

12. Mirzaei S, Steffen A, Vuckovic K, et al. The association between symptom onset characteristics and prehospital delay in women and men with acute coronary syndrome. *Eur J Cardiovasc Nurs.* 2019:1474515119871734.

13. Maliszewski B, Whalen M, Lindauer C, Williams K, Gardner H, Baptiste D-L. Quality improvement in the emergency department: a project to reduce door-to-electrocardiography times for patients presenting with chest pain. *J Emerg Nurs.* 2020;46(4):497-504. e492.

14. Bhatt DL, Lopes RD, Harrington RA. Diagnosis and treatment of acute coronary syndromes: a review. *JAMA.* 2022;327(7):662-675.

15. Arslanian-Engoren C. Explicating nurses' cardiac triage decisions. *J Cardiovasc Nurs.* 2009;24(1):50-57.

16. Devon HA, Rosenfeld A, Steffen AD, Daya M. Sensitivity, specificity, and sex differences in symptoms reported on the 13-item Acute Coronary Syndrome Checklist. *J Am Heart Assoc.* 2014;3(2):e000586.

17. van Oosterhout RE, de Boer AR, Maas AH, Rutten FH, Bots ML, Peters SA. Sex differences in symptom presentation in acute coronary syndromes: a systematic review and meta-analysis. *Journal of the American Heart Association.* 2020;9(9):e014733.

18. Cairns C, Kang K. National Hospital Ambulatory Medical Care Survey: 2019 Emergency Department Summary Tables. 2022.

19. Sandelowski M. Focus on research methods-whatever happened to qualitative description? *Res Nurs Health.* 2000;23(4):334-340.

20. Sandelowski M. What's in a name? Qualitative description revisited. *Res Nurs Health.* 2010;33(1):77-84.

21. Miles MB, Huberman AM, Saldaña J. *Qualitative data analysis: A methods sourcebook.* Sage publications; 2018.

22. Garcia S, Dehghani P, Grines C, et al. Initial findings from the North American COVID-19 myocardial infarction registry. *J Am Coll Cardiol.* 2021;77(16):1994-2003.

23. Braiteh N, ur Rehman W, Alom M, et al. Decrease in acute coronary syndrome presentations during the COVID-19 pandemic in upstate New York. *Am Heart J.* 2020;226:147-151.

24. Sanyaolu A, Marinkovic A, Prakash S, et al. Post-acute Sequelae in COVID-19 Survivors: an Overview. *SN Comprehensive Clinical Medicine.* 2022;4(1):1-12.

25. SeyedAlinaghi S, Afsahi AM, MohsseniPour M, et al. Late complications of COVID-19; a systematic review of current evidence. *Archives of academic emergency medicine.* 2021;9(1).

26. Yang K, Wen G, Wang J, et al. Complication and Sequelae of COVID-19: What Should We Pay Attention to in the Post-Epidemic Era. *Front Immunol.* 2021;12:711741.

TABLE 1. Participant Characteristics by Effects of COVID-19 on Practice

Variables	COVID-19 Affected Triage/ Assessment of Acute Cardiac Patients		
	Yes (n = 180)	No (n = 264)	*p*-value
Recruitment method, n (%)			.346
Postcard	139 (77.2)	188 (71.2)	
Friend or colleague shared	39 (21.7)	71 (26.9)	
Emergency Nurses Association Web site	2 (1.1)	5 (1.9)	
Age, mean (SD) in years	40.9 (11.9)	42.2 (12.6)	.251
Years as Registered Nurse, median (IQR)	10.0 (13.8)	11.0 (19.0)	.454
Years as ED Registered Nurse, median (IQR)	7.0 (11.0)	7.5 (11.0)	.967
Gender, n (%)			.128
Woman	153 (85.0)	(77.7)	
Man	27 (15.0)	58 (22.0)	
Prefer not to respond	0 (0.0)	1 (0.4)	
Highest Level of Nursing Education, n (%)			.147
Associate degree or diploma	23 (12.8)	48 (18.2)	
Baccalaureate degree	106 (58.9)	160 (60.6)	
Master's degree	49 (27.2)	50 (18.9)	
Doctor of nursing practice degree	2 (1.1)	4 (1.5)	
PhD or equivalent degree	0 (0.0)	2 (0.8)	
Role in the Emergency Department, n (%)			.735
Staff nurse	96 (53.3)	140 (53.6)	
Charge nurse	51 (28.3)	84 (32.2)	
Manager, assistant manager, or supervisor	13 (7.2)	15 (5.7)	
Director	4 (2.2)	3 (1.1)	
Other	16 (8.9)	19 (7.3)	
Received Training for the Triage Role			.537
Yes	155 (88.6)	206 (85.5)	
No	20 (11.4)	33 (13.8)	

Certified Emergency Nurse			.074
Yes	96 (53.3)	118 (44.7)	
No	84 (46.7)	146 (55.3)	
Emergency Department Location, n (%)			.538
ENA Region 1 (AK, CA, HI, ID, MT, NV, OR, UT, WY, WA)	29 (16.3)	51 (19.5)	
ENA Region 2 (AZ, CO, KS, LA, NE, NM, OK, TX)	24 (13.5)	32 (12.2)	
ENA Region 3 (IL, IN, IA, KY, MI, MN, MO, ND, SD, WI)	81 (45.5)	105 (40.1)	
ENA Region 4 (DE, MD, OH, PA, VA, WV, D.C.)	14 (7.9)	21 (8.0)	
ENA Region 5 (CT, ME, MA, NH, NJ, NY, RI, VT)	16 (9.0)	19 (7.3)	
ENA Region 6 (AL, AR, FL, GA, MS, NC, SC, TN)	9 (5.1)	26 (9.9)	
Travel Nurse (Variable Location)	5 (2.8)	8 (3.1)	
Emergency Department is Certified Chest Pain Center, n (%)			.825
Yes	101 (56.1)	143 (54.2)	
No	47 (26.1)	76 (28.8)	
Unsure	32 (17.8)	45 (17.0)	
Number of Beds in Emergency Department, n (%)			.548
10 or fewer	16 (8.9)	25 (9.5)	
11 to 20	27 (15.0)	37 (14.0)	
21 to 30	41 (22.8)	56 (21.2)	
31 to 40	28 (15.6)	54 (20.5)	
41 to 50	18 (10.0)	24 (9.1)	
51 or more	50 (27.8)	64 (24.2)	
Unsure	0 (0.0)	4 (1.5)	

Note. ED = emergency department, ENA = Emergency Nurses Association. Missing data are not reported in the table. Median was used to represent central tendency of non-normally distributed data, while mean was used for normally distributed data. Chi-square was used for categorical data. For continuous data, independent-samples t-test was used for normally distributed variables, and the Mann-Whitney U test was used for non-normally distributed data.

Figure 1. A Conceptual Display of Response Categories: "It changed everything."