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Cover Page Footnote

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ORIGINAL ARTICLE

Effect of COVID-19 Pandemic on the Cardiac Outpatients' Perception of Seeking Medical Advice

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Abstract

Objectives: **During this unprecedented time of COVID-19 pandemic, it was noticed a decline in cardiovascular cases presentation to the Emergency rooms in many countries, raising many speculations about the reasons and its ramifications. 1 - Identify the reasons during this pandemic that refrain patients from seeking medical care and its impact on stress level and medication adherence. 2 - Emphasize the new role of virtual medicine.**

Methods: **A quantitative descriptive cross-section survey study of 388 patients. It has been done in the cardiac outpatient department and conducted virtually through telemedicine.**

Results: **Despite this pandemic and its consensuses, the majority of cardiac outpatients will still seek medical advice in case of experiencing symptoms. Nevertheless, the fear of contracting COVID-19 infection, which can alter patient's decisions from visiting the emergency room and the increase in stress level during these challenging times, is genuine and no more an element of guessing.**

Conclusion: **The majority of cardiac outpatients will wisely seek medical advice in case of serious cardiac symptoms and are adherent to their medications during this pandemic. Nevertheless, they face many concerns which need to implement a preventive and helping measures to fight the consensuses of COVID-19 such as, patient educations, establishing a hotline to all patients, telemedicine, new phone applications, and delivering medications to patients are essential in such circumstances to ensure continuity of care.**

Key words: COVID-19, Cardiovascular disease, Fear of infection, Pandemic, Stress

1. Introduction

The coronavirus disease-2019 (COVID-19) has caused massive disruption of healthcare delivery for non-communicable diseases worldwide. This drastic shift has been speculated to be due to fear of infection, governmental-issued social distancing laws, and travel restrictions [1]. Cardiac patients were no exception, as there is a noticeable decline in the number of emergency department visits by patients who have cardiac problems and some reports of increased out of hospital mortalities [2], which is concerning.

The decline in acute coronary syndrome admissions was reported in many areas around the world, including Italy [3], Austria [4] and the United States [5]. A nationwide analysis of 73 Spanish centers [6] found that cardiac diagnostic and therapeutic procedures carried out after the beginning of the lockdown have declined by 57%, 48%, 81% fewer diagnostic examinations, therapeutic coronary procedures, and structural transcatheter interventions, respectively.

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Understanding the exact nature of this effect is of great importance to be able to implement appropriate measures to care for this group of vulnerable patients.

2. Methods

This is a single-center cross-sectional survey study done at the Cardiology Out-Patient Department for all patients who have been booked for regular cardiac follow up from April 19 to 23, 2020. No new patients or first visit cases are included. The questionnaire was conducted through telephone calls, where physicians called the assigned patients to their clinic and obtained verbal consent and proceeded with the questionnaire. A structured electronic survey was designed by the investigators of this study and validated by a group of attending physicians. There was no validated questionnaire available in the literature at the time the survey took its place. A pilot study was conducted using 10% of the calculated sample size, to establish validity and reliability of the survey's tool before conducting the actual survey.

The sample size was calculated based on outpatient clinic visits of the previous year 2019, where there were 120,000 visits to the adult cardiology clinics with an average of two visits per patient per year, giving an estimate of 60,000 patients/year. Therefore, the calculated sample size was 382 participants with counting for a 5% margin of error and 95% confidence interval [7]. Fortunately, we managed to enroll 388 patients.

The questionnaire included patients' demographic information, existing comorbidities, and the health status of the participants. Coronary artery disease is defined as any patient who had an ischemic cardiac event in the past, coronary percutaneous intervention, or coronary bypass surgery. Valve heart disease is defined by any valvular lesion, which was considered moderate or more in severity, previous surgical valve replacement or repair, or any history of percutaneous valve intervention. The marital, educational, and socioeconomic status are not included in the questionnaire.

All participating patients are Saudi, and the Saudi government fully covers their health expenses as universal health care. There were specific questions with prespecified choices. Questions addressed participants' perception of seeking medical care in case of experiencing cardiac symptoms, which is explicitly defined as either chest pain or shortness of breath. We included a question inquiring if their responses to the above question would be altered if there were no current pandemic.

Abbreviation

COVID-19	The Coronavirus Disease-2019
EMS	Emergency Medical Service
CP	Chest Pain
SOB	Shortness Of Breath

We also addressed the pandemic impact and curfew on their general stress level and medication compliance. We took stress as a more general concept without specification or determination of triggers for it and is defined as a state of mental or emotional strain or tension from demanding circumstances from this pandemic. A copy of the questionnaire is available in Table 1.

Descriptive statistics were conducted to analyze the results.

Ethical approval was obtained from the Cardiac Research Department at the center where the study was conducted.

3. Results

From the survey of 388 patients, there were 246 male patients (63.6%) and 142 female patients (36.4%). Almost half of the participants, 201 patients (51.7%), resided in Riyadh where the study was conducted, while 187 patients (48.3%) from outside the city. Patients' demographics and characteristics are demonstrated in Table 2.

In case of experiencing symptoms of chest pain or shortness of breath, we found that 170 patients (43.8%) will go to the emergency room to seek medical attention, while 149 patients (38.4%) reported that they would call emergency medical services (EMS) number 997, and 157 patients (14.7%) said they would go to a nearby clinic/family doctor. Only 12 patients (3.1%) said they would do nothing [Fig. 1a].

In total, 318 patients (82.2%) reported that they would seek urgent medical assistant divided between heading to the Emergency department and calling EMS.

Upon questioning if their decision would have changed if there was no pandemic, it revealed that 268 of patients (69%) would not take the same action, while120 of them (31%) would have done the same. The questionnaire did not address the possible reasons for patients changing their answers if there was no pandemic.

Upon assessing factors that might cause patients to hesitate to visit the emergency room in case if they got sick in general, 141 patients (36.3%) responded, it would be the fear of infection. The remaining had different concerns as 62 patients

Table 1. Study questionnaire.

Section A. Demographic Data and Verbal Consent
Obtained verbal consent from participant
▫ No
▫ Yes
Age (years)
Gender
▫ Male
▫ Female
Residency
▫ within Riyadh City
▫ outside Riyadh City
Section B. Medical History
Hypertension
▫ No
▫ Yes
Diabetes
▫ No
▫ Yes
Coronary artery disease
▫ No
▫ Yes
Valvular Heart disease
▫ No
▫ Yes
Chronic Kidney Disease
▫ No
▫ Yes
COPD
▫ No
▫ Yes
Atrial Fibrillation
▫ No
▫ Yes
DCM
▫ No
▫ Yes
Device Therapy
▫ No
▫ Yes
Section C. Patient's perception
1. In case of experiencing cardiac symptoms, what will you do?
▫ Go to the emergency department
▫ Go to a nearby clinic
▫ call 997
▫ do nothing
2. What would make you concerned or hesitant from seeking medical care/visiting an Emergency room?
▫ Fear of getting infected
▫ concerned with the fines in violation of the 24-h curfew
▫ Impossible due to geographical location, no means of transport, no flight
▫ None
3. If there was no pandemic would you do the same?
▫ No
▫ Yes
4. What is the effect of the pandemic and curfew on your stress level?
▫ Increase
▫ Decrease
▫ No effect
5. What is the effect of the pandemic on your medication's compliance?
▫ Increase compliance
▫ Decrease compliance
▫ No effect

(*continued on next page*)

(15.7%) were concerned with violating the country-wide curfew and the subsequent fine, while 15 patients (3.9%) mentioned there are mainly concerned with travelling and public transportation challenges. Interestingly, 170 patients (44.1%) were neutral with no concerning issues if they ever needed to visit the emergency room [Fig. 1b].

Upon assessing pandemic related general stress levels, 200 patients (51.5%) mentioned that the pandemic and curfew did not affect their stress level. On the other hand, 184 patients (47.4%) felt it increased, and 4 of them (1.1%) said it decreased [Fig. 1c].

When asked about medications' compliance during this pandemic, 282 patients (72.7%) reported it did not affect their compliance, and 69 patients (17.8%) reported improved compliance, and 37 of them (9.5%) reported a decline in their medication's compliance. In total, 351 patients (90.5%) reported either better or consistent medication adherence [Fig. 1d].

Table 2. Participants' demographic characteristics and medical history.

Characteristics	Value
Age	62.2 -+ 14.3
Male	246 (63.6)
Female	142 (36.4)
Within Riyadh	201 (51.7)
Outside Riyadh	187 (48.3)
Hypertension	230 (59.3)
Diabetes	216 (55.8)
Coronary artery disease	225 (58)
Valvular heart disease	121 (31.4)
Chronic kidney disease	21 (5.3)
COPD	5 (1.3)
Atrial fibrillation	19 (4.9)
DCM	8 (2.2)
Device therapy	15 (3.8)
Left ventricular ejection fraction	
55%–65%	(48.8)
45–54%	(29.9)
30–44%	(13.2)
<30%	(7.9)

COPD: chronic obstructive pulmonary disease.
DCM: dilated cardiomyopathy.
Device therapy included: Permanent pacemaker, Cardiac resynchronization therapy, Intracardiac defibrillator.

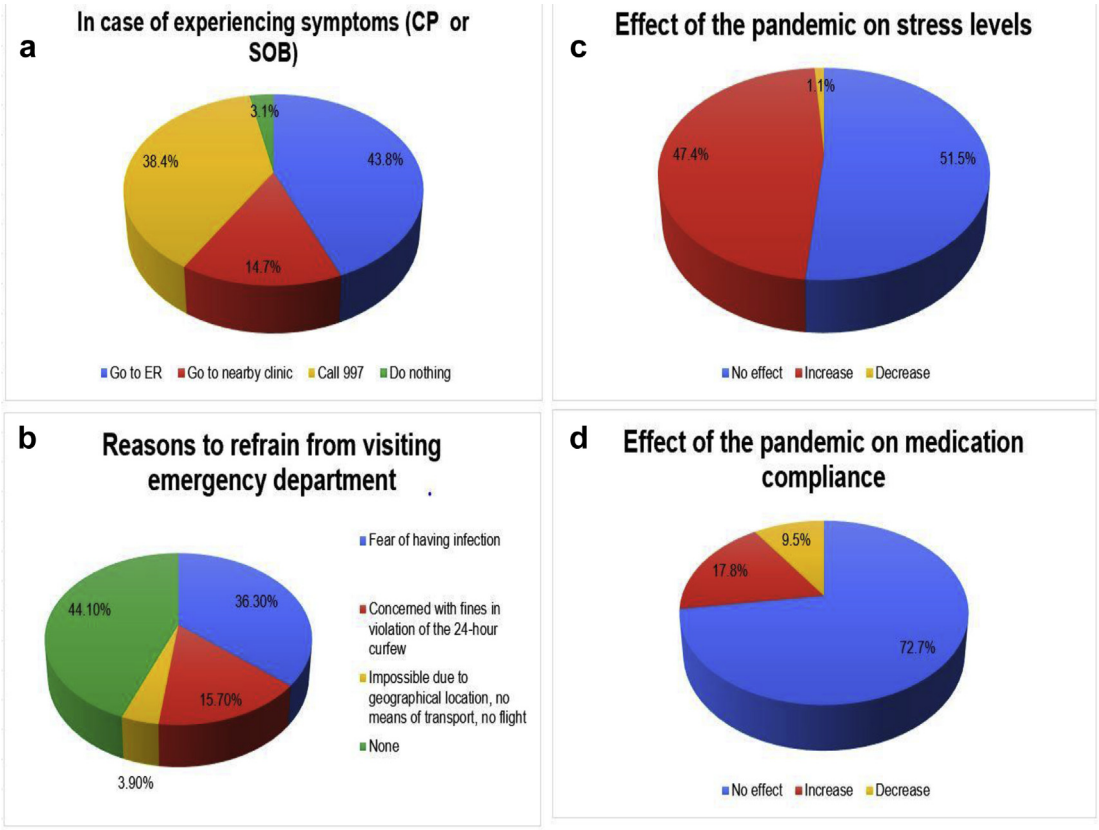

Fig. 1. (a) patients' perception when developed symptoms (Chest pain and or shortness of breath). (b) Reasons refraining from ER visits. (c) Effects of pandemics on stress level. (d) Effects of pandemics on medications' compliance.

4. Discussion

Key findings in this study showed that despite the emerging pandemic and curfew, most cardiac patients who are on regular follow up would appropriately seek urgent medical attention in different forms in case of experiencing chest pain or shortness of breath symptoms. Also, fear of contracting COVID-19 infection is a significant factor in altering patients' decisions to seek medical care.

Our results cast a new light on the awareness of patients with chronic cardiac diseases about their health. Most of the patients identified the indication of seeking urgent medical care correctly. However, still, a portion of the patients did not. Those patients are the ones that should be targeted with health education. With the challenges enforced by the pandemic, patient's education and knowledge are essential to how to judge the need to seek medical help in an emergency setting.

Apart from cardiac disorders, there was an apparent effect of this current pandemic on patients' health decisions during this challenging period. As shown in our study, patients are trying to avoid hospital visits, which was mainly related as we found to the fear of contracting COVID-19 infection. This is a real concern among patients and no longer mere speculation and must be addressed. Nevertheless, 171 patients out of 388 mentioned they were neutral and had no fear or concerns about visiting the emergency room if needed. We may attribute their answer to the awareness and knowledge of these patients about their health condition being at risk or possibly their higher educational level.

As we now became more aware of the impact of this unprecedented pandemic, nationwide initiatives can address this more efficiently. Many solutions have been applied to reduce the pandemic's effect, starting with the implementation of telemedicine or virtual clinics [8], especially for patients who are in rural areas apart from the pandemic, they are burdened with travel restrictions.

Add to it, governmental efforts such as the ones offered by the Saudi Ministry of Health in the form of free smartphone applications enable the public to seek medical advice via a video call with a health care provider. These applications also assist in spreading standard infection control pieces of advice and answer any COVID-19 related questions [9,10].

We also recommend raising awareness through the media that emergencies are exempted from paying fines in breaking curfew, which was the second barrier reported by our patients to seeking medical advice.

Few papers recently discussed the effect of the pandemic and social distancing on stress levels among patients with chronic diseases, and its possible consequences [11,12], including medication compliance [13]. In our study, the results demonstrate two things. First, 184 participants (47.5%) of this survey have reported a general increase in stress level, which should be taken into account and addressed by providing pandemic-related mental health services, possibly in the future. Second, most of the patients reported that the pandemic and curfew did not affect or improve their medication adherence. The consistent adherence could be explained by the patients' awareness of their health status, the benefit of telemedicine, and the advantage of mailed medication service directly to patients' houses regardless of their location.

4.1. Study Limitations

Its susceptibility for biases being a single center with one population in question, and therefore, the results cannot be generalized. The paper did not address the patients' social-economic back round, which can play a role in their answers. Cardiac symptoms were defined as either chest pain or shortness of breath; other symptoms, such as syncope, were not included. The stress level was taken more in the general concept, and we did not cover the classification or possible triggers for it. Further studies are needed to understand the actually impact of the pandemic on the cardiac patients and the general population of Saudi Arabia.

5. Conclusion

The findings of this study can be understood as, despite this pandemic, the majority of cardiac outpatients who have a regular follow up with their physician will wisely seek medical advice in case of symptoms of chest pain or shortness of breath, and be adherent to their medications. However, the fear of COVID-19 that might prevent people from visiting the emergency room and the stress related to this pandemic is genuine. Measures such as patient educations, establishing a hotline to all patients, telemedicine, and delivering medications to patients are essential in such circumstances to ensure continuity of care.

Conflicts of Interest

None declared.

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Author contributions

Conception and design of study: Sondos A. Samargandy, Turki A. Al Garni, Abdulrahman Moghairi, Hussein A. Amri, Shaza Samargandy. Literature review: Hussein A. Amri, Shaza Samargandy, Acquisition of data: Mohammad Alahmari, Bandar AlShehri, Mohammad Mosaad, Jamal M. Nour Ahmed, Hussein A. Amri, Shaza Samargandy. Analysis and interpretation of data: Turki A. Al Garni, Mohammad Alahmari, Bandar AlShehri, Jamal M. Nour Ahmed, Shaza Samargandy. Analysis and interpretation of data: Sondos A. Samargandy, Abdulrahman Moghairi, Hussein A. Amri, Shaza Samargandy. Research investigation and analysis: Sondos A. Samargandy, Abdulrahman Moghairi, Hussein A. Amri, Shaza Samargandy. Research investigation and analysis: Turki A. Al Garni, Mohammad Alahmari, Bandar AlShehri, Mohammad Mosaad, Jamal M. Nour Ahmed. Data collection: Turki A. Al Garni, Mohammad Alahmari, Bandar AlShehri, Mohammad Mosaad, Jamal M. Nour Ahmed. Drafting of manuscript: Sondos A, Samargandy, Shaza Samargandy. Revising and editing the manuscript critically for important intellectual contents: Sondos A. Samargandy, Turki A. Al Garni, Abdulrahman Moghairi, Hussein A. Amri, Shaza Samargandy. Data preparation and presentation: Sondos A. Samargandy, Turki A. Al Garni, Abdulrahman Moghairi, Hussein A. Amri, Shaza Samargandy. Supervision of the research: Sondos A. Samargandy, Shaza Samargandy. Research coordination and management: Sondos A. Samargandy, Turki A. Al Garni, Abdulrahman Moghairi, Hussein A. Amri, Shaza Samargandy.

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