How Screening Plays Role in COVID-19 Management? Results of a Cross-Sectional Study on COVID-19 Patients Signs and Symptoms

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ABSTRACT

Background Today, COVID-19 outbreak has become a global alert. So, lots of medical complications and socioeconomic and mental burdens have arisen following the outbreak of the disease. There is no adequate general strategy for total control of the virus's widespread. According to this, preventive or early diagnostic measures are crucial. In this study, we designed a questionnaire in the context of the 4,030 telephonic platform to assess the most common symptoms of COVID-19 in Iran.

Material and Methods A questionnaire that had been designed with 20 common and rare symptoms of COVID-19 was filled out by 115 operators of 4,030, a 24-hour call center to answer the Iranians' questions associated with COVID-19 and screen probable COVID-19 cases.

Results Common COVID-19 symptoms among people included cough, dyspnea, sore throat, myalgia, headache, anosmia, fever, dysgeusia, chilling, lethargy, and fatigue. Also, less common symptoms were rhinorrhea, sneeze, vomiting, diarrhea, nasal congestion, eyesore, stomach ache, jaw pain, dry mouth, and abdominal cramps.

Conclusions Our study showed that the most common symptoms of COVID-19 in Iran include cough, dyspnea, sore throat, myalgia, headache, anosmia, fever, dysgeusia, chilling, lethargy, and fatigue. Some symptoms may incident due to over-use of disinfectants, or aggravated by fear of infection, or misdiagnosed with other issues such as food poisoning, flu, panic attacks, and allergies. Consequently, It seems that screening can help find new cases who haven't refered to hospitals and health care centres, and this can result in COVID-19 improving, COVID-19 management, and decreasing the costs of patients and health systems.

Introduction

Emerging infectious diseases cause serious public health issues that affect populations and governments. Since December 2019, a current explosion of pneumonia was identified with a novel coronavirus, severe acute respiratory syndrome (SARS) coronavirus-2, recorded in Wuhan, Hubei Province, China.[1,2] As the enormous spread of COVID-19, World Health Organization (WHO) declared this outbreak a global pandemic on March 11, 2020. The first Iranian case of COVID-19 was confirmed on February 19, 2020, in Qom city.[3] As of June 17, 2021; 3,060,135 confirmed cases and 82,480 deaths were reported in Iran.[4]

The most common clinical manifestations which set up criteria for testing COVID-19 infection include fever, cough, shortness of breath, myalgia, and rare symptoms including headache, confusion, sore throat, diarrhea, chest pain, rhinorrhea, nausea, and vomiting.[5] Also, mortality rates were higher in older patients than young adults and kids.[6] Expectedly, the case mortality is reported higher in critically infected patients, reaching 87.5-100% among those older than 70 years.[7]

Besides mentioned problems, some complications due to COVID-19 infection may occur. Persistence of some symptoms after discharge, such as dyspnea and asthenia[8], acute and late neurological[9], cardiovascular[10], and pulmonary complications[11] are reported during and after the COVID-19 infection. So, the appropriate follow-up after discharge is required for preventing or improving these complications. In addition, the proper screening to find the symptomatic/asymptomatic patients helps to prevent the widespread of the virus by isolating or quarantining the patients. Also, an effective screening may prevent the progression of the disease by early diagnosis and treatment; however, a purely effective pharmacotherapy regimen for COVID-19 is not available.

Diagnosing COVID-19 depends on the following criteria: clinical symptoms, epidemiological history, positive CT images, and positive pathogenic testing.[12] Tools enabling rapid screening of the COVID-19 infection with high accuracy can be crucially helpful to the healthcare professionals. The primary clinical test currently in use for diagnosing of COVID-19 is the reverse transcription-polymerase chain reaction (RT-PCR), which is expensive, less sensitive, and requires specialized medical personnel.[13]

Due to the prevalence of coronavirus in Iran and the increase in the number of people infected with this virus and public concern in this regard, the need to establish a 24-hour call center to answer questions and provide effective training, reducing stress and concerns, and preventing and combating the virus is an inevitable necessity. In this regard, the Ministry of Health and Medical Education of Iran has established a 24-hour call center called 4,030 platform to answer questions and provide services to people in the field of COVID-19.[14]

There is currently no approved medicine for COVID-19 treatment and vaccination has not been universal yet. Undoubtedly, in the current situation, a call center has a very prominent and important role in providing counseling, education, prevention, reducing anxiety and dealing with the coronavirus, answering ambiguities, and preventing gossip by providing correct and scientific answers to people's questions.[14]

Herein, due to the critical role of the early diagnosis in the COVID-19 pandemic and its effects on public health, we reported the results of our analysis of the clinical manifestation of COVID-19 in Iranian people and discussed the role of screening platforms in COVID-19 management.

Material and Methods

Study Design

Data of symptoms of callers were gathering in the context of a national telephonic COVID-19 diagnosis and follow-up platform called 4,030 that was established in March 2020. The people who answered the phone were medical doctors, pharmacists, nurses, health care providers, and other positions related to the health system, voluntarily registered in this system from all over Iran. These people, as operators, had trained in issues related to the diagnosis of COVID-19 symptoms and were answering caller's questions about COVID-19 around the clock.

Setting

In this cross-sectional study, an online questionnaire with 20 questions according to approved COVID-19 symptoms in medical evidence was filled out by 4,030 operators based on symptoms of callers from 15 to 19 December 2020.

Participants

115 operators who counseled at least 100 callers daily, and were aware of the symptoms of the disease answered 20 questionnaire questions based on the frequency of observed symptoms. Frequent was determined as reported more than 5 times from every 100 calls.

Laboratory and Pathological Parameters

Questionnaire variables were designed based on the most common symptoms that were presented by reputable global sites at the time of our study.

The variables were questioned included sore throat, cough, dyspnea or shortness of breath, headache, myalgia, vomiting, diarrhea, anosmia, dysgeusia, abdominal cramps, nasal congestion, rhinorrhea, sneeze, ophthalmia, jaw pain, stomach ache, lethargy and fatigue, fever, dry mouth, and chilling.

Statistical Analysis

Statistical analysis used for this study was measured using quantitative frequency indices and the number and percentage of SPSS version 22.

Table 1. Symptoms reported by operators from screened people

Symptoms	People with symptom n (%)	People without symptom n (%)
Sore throat	68 (60%)	47 (40%)
Cough	84 (74%)	31 (26%)
Dyspnea or shortness of breath	77 (67%)	38 (33%)
Headache	58 (51%)	57 (49%)
Myalgia	71 (62%)	44 (38%)
Vomiting	31 (27%)	84 (73%)
Diarrhea	40 (35%)	75 (65%)
Anosmia	68 (60%)	47 (40%)
Dysgeusia	61 (54%)	54 (46%)
Abdominal cramps	20 (18%)	95 (82%)
Nasal congestion	26 (23%)	89 (77%)
Rhinorrhea (rhinitis)	19 (17%)	96 (83%)
Sneeze	19 (17%)	96 (83%)
Ophthalmia (eyesore)	18 (16%)	97 (84%)
Jaw pain	3 (3%)	112 (97%)
Stomachache	28 (25%)	87 (75%)
Lethargy and fatigue	68 (60%)	47 (40%)
Fever	75 (66%)	40 (34%)
Dry mouth	35 (31%)	80 (69%)
Chilling	69 (60%)	46 (40%)

Results

Descriptive Data

More than 50% of 4,030 experts confirmed that the most common COVID-19 symptoms include cough, dyspnea, sore throat, myalgia, headache, anosmia, fever, dysgeusia, chilling, lethargy, and fatigue. Also, more than 50% of 4,030 experts determined that rhinorrhea, sneeze, vomiting, diarrhea, nasal congestion, eyesore, stomach ache, jaw pain, dry mouth, and abdominal cramps had the least prevalence among people suspected of COVID-19.

Outcome data

The results of patients' symptoms are provided in table 1.

Discussion

The increase in the number of patients and the lack of appropriate treatments led us to identify patients in the early stages of the disease through the 4,030 platform. The reported symptoms were recorded in a questionnaire.

The analysis of 21 studies involving COVID-19 patients exhibited that most patients with clinical disease manifested sore throat (43.9%), dyspnea (52.7%), cough (62.6%), and fever (75.3%), as the frequently recorded symptoms. Other described manifestations were less common (20-38%) and included myalgia, fatigue, diarrhea, vomiting/nausea, nasal congestion, anorexia, and headache. The least frequently mentioned symptoms (<20%) were abdominal pain, anosmia, dysgeusia, dizziness, and chest pain.[5] Based on our study results, the most reported symptoms to the 4,030 operators were consistent with the global manifestation of COVID-19. Our result showed that most people who had called the 4,030 were infected by COVID-19, which is a high number. Also, most of the symptoms developed 11 days after infection. However, this chiefly depends on age and comorbidities that is not possible for us to include these items in the questionnaire.[5]

Since reported from September 2020, the B.1.1.7 variant in the UK[15], cough, fatigue, weakness, myalgia, sore throat, headache, and fever are more common than other variants, and anosmia and dysgeusia are less common in the UK variant. In the UK variant, the most informed symptoms include all reported symptoms, involving reporting symptoms compatible with COVID-19 while not naming specific symptoms, and the classic symptoms such as cough, fever, dyspnea, but were less likely to report a loss of taste and smell. There was no evidence of a difference between the percentages of reporting gastrointestinal symptoms.[16] The comparison between the symptoms of the UK variant and our results showed that the UK variant may have been present in Iran during that period. Also, the B.1.617 variant called the "Indian variant" had been detected in October 2020 in India. There is no evidence that B.1.617 has different symptoms from B.1.1.7.[17] Therefore, it is possible that this variant also existed in Iran while filling out the questionnaire. Generally, one of the screening advantages is its role in analyzing the common virus variant and its congestion in society.

A definite issue is to magnify mild-to-moderate and non-serious signs and symptoms. Symptoms of food poisoning, panic attack, medication side effects, anxiety, allergies, and minor flu may misunderstand by some symptoms of COVID-19. Also, the incidence of a symptom similar to the symptoms of COVID-19, if accompanied by indoctrination and fear of COVID-19 infection, may aggravate these symptoms and cause misdiagnosis of the disease without diagnostic tests. High prevalence of some symptoms such as dyspnea, cough, and headache may be due to overuse of disinfectants such as bleach and alcohol in high percentage. Therefore, it is difficult to make a definitive diagnosis only based on symptoms without knowing a person's medical and social history.

Follow-up of patients with this disease becomes of note. We need to know how many of the 4,030 callers tested positive for COVID-19 and are among COVID-19 definitive cases. One of the crucial roles of 4,030 is to advise patients with mild-to-moderate COVID-19 symptoms to do home quarantine to prevent the spread of the disease to family members and other people. Also, 4,030 operators recommend individuals who have more severe symptoms or report a history of close contact with the COVID-19 patients to perform definitive diagnostic tests and follow the protocols. 4,030 operators can also differentiate

the symptoms of the disease from the signs of other difficulties such as food poisoning, panic attacks, and other mentioned problems, and accordingly guide the patients to stay at home and take measures or refer them to the physician for a clinical examination and tests if needed.

One caveat to close with is that the recommendation for early diagnosis to slow down the virus's rapid spread depends on the notion that no treatment is available efficiently. In lack of successful treatment, knowing how to manage the health of society through preventive and primary care is the most potent defense at the first step. In the second step, monitoring the symptomatic patients is considered. In the third and last step, following the patient up after recovery of illness or discharge is noteworthy to prevent the probable complications.

Limitations

Unfortunately, the study did not include factors such as age, sex, medical history, medication use, and social activities. This study was also limited by the absence of clarifying that how long it took to develop symptoms in infected people.

Future Research

We believe that screening can play a crucial role in or COVID-19 pandemic management as it can facilitate patients' diagnosis. Due to limitations, our recommendation to researchers is to involve the actual number of patients, age, sex, medical history, comorbidities, and the duration of symptoms incidence in their research to achieve more valuable results. Also, follow-up and monitoring of patient's symptoms should be on the agenda. All in all, we think screening and following up can help to manage COVID-19 and decrease its mortality rate and health system costs.

Conclusions

Our study has shown that the most common symptoms of COVID-19 in Iran include cough, dyspnea, sore throat, myalgia, headache, anosmia, fever, dysgeusia, chilling, lethargy, and fatigue. Some symptoms may incident due to over-use of disinfectants, or aggravated by fear of infection,

or misdiagnosed with other issues such as food poisoning, flu, panic attacks, and allergies. The existence of B.1.617 and B.1.1.7 variants in Iran is still controversial and requires definitive diagnostic tests to confirm.

Conflict of interest

The authors declared that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Authors' Contribution

Study Conception: MA, EAA; Study Design: MA, EAA; Supervision: EAA; Data Collection and/or Processing: MA; Statistical Analysis and/or Data Interpretation: MA, FTF, AP, EAA; Manuscript Preparation: FTF, AP; and Critical Review: AP, EAA.

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