



# A Social Survey on the COVID-19 Mortality Related to the First 48 Hours of Hospitalization

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## Abstract

**Background:** COVID-19, caused by severe acute respiratory syndrome (SARS), is known for high mortality rates across the globe. Nonetheless, early diagnosis and treatment of this infectious disease are critical for increasing the recovery and survival of patients. The present study aimed to investigate the causes of delays in referring to hospitals regarding COVID-19 deaths in the first 48 hours of hospitalization to reduce mortality.

**Methods:** In this cross-sectional study, we extracted data from the families of 213 patients who died of COVID-19 between February 2020 and February 2021 in Mashhad, Iran. The data were collected via phone using an 18-item checklist designed by a panel of experts and related to the causes of hospitalization delays.

**Results:** Out of the 213 patients who died of COVID-19 in hospitals, 62.5% (133) were male, older ( $64 \pm 12$  years), illiterate (42%), and with one or more comorbidities (92.4%). Regarding the effect of 10 delay causes in the checklist related to hospitalization, it was reported that the highest score pertained to the fear of hospitalization (55.8%), following physicians' advice about not referring to hospitals (44.1%), and taking herbal medicines (32.3%), respectively.

**Conclusion:** Certain groups at higher risk of COVID-19 mortality included males, older individuals, and those with comorbidities. Fear of hospitalization was the main reason for delays in referring to hospitals, suggesting the role of demographic characteristics, socioeconomic status, and, most importantly, the role of social factors in increasing premature mortality.

**Keywords:** COVID-19, Delay cause, Hospitalization, Mortality

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## Introduction

COVID-19, caused by severe acute respiratory syndrome (SARS), has become a global pandemic. COVID-19 has negatively impacted the global economy, especially the healthcare system (1,2). Among the significant adverse effects of the virus on the healthcare system are the neglect of other health services, overload for physicians and other healthcare professionals, and serious concerns about reduced quality of hospital function these days (2). Furthermore, this virus has led to a high rate of daily mortality in various countries across the globe (3).

Several studies have demonstrated that mortality is higher among vulnerable groups, such as the elderly (3) or people with comorbidity (4). Moreover, various systematic studies have investigated the risk factors of hospital mortality associated with COVID-19 in the world (5) and Iran (6,7). Although these studies examined clinical and laboratory risk factors, they did not consider social and

psychological risk factors associated with hospitalization. Also, the pathogenicity of the virus during hospitalization appears to be necessary. According to recent research, the virus pathogenicity is in three successive stages: pulmonary, pro-inflammatory, and prothrombic (8). Due to different therapeutic approaches in these stages of pathogenesis, early therapeutic approaches associated with each stage of virus pathogenesis should be considered to maximize recovery and survival in COVID-19 patients (9). Therefore, apart from the critical identification of clinical and epidemiological characteristics, the early identification of virus-associated hospitalization risk factors can facilitate appropriate supportive care and rapid access to the intensive care unit (ICU) at the right time.

Nevertheless, the COVID-19 Mortality Committee of the Mashhad University of Medical Sciences investigated that the most crucial factor leading to the death of



COVID-19 patients was a delay in referring to medical centers for hospitalization. There are various hypotheses in this regard; therefore, it seems that research is socially needed to identify the causes of these delays closely. In light of the issues above, the present study was designed and conducted as the first study to evaluate the factors associated with delays in referring to the hospitals of Mashhad University of Medical Sciences (MUMS) regarding COVID-19 deaths in the first 48 hours of hospitalization.

## Materials and Methods

### Study design

The study was retrospective, and an interview was conducted from March to April 2021 in Mashhad, Iran. Due to the lack of similar studies on this subject and also the availability of a large number of COVID-19 deaths, information was collected from 598 deaths that occurred in less than 48 hours of hospitalization (as inclusion criteria) in Imam Reza, Ghaem, and Hasheminejad hospitals (from February 2020 to February 2021). Due to the unwillingness of deceased families to participate in the study or lack of accurate information to answer questions (as exclusion criteria), 385 deaths were excluded from the study, and ultimately, 213 were included. The families of deceased people were interviewed via phone using a checklist designed by experts. The panel of experts consisted of three people as prominent members of the panel (an intensivist, a lung specialist, and an epidemiologist) and two individuals as guests (the representative of the treatment deputy of MUMS and the secretary of the mortality group associated with the COVID-19 Scientific Committee of Khorasan Razavi province).

### Data collection

The checklist included 18 items: 8 items related to demographic information and the patient's conditions before death, as well as ten items on the causes of delays in hospitalization. The telephone interview was conducted by two colleagues of the research team (to consider reducing errors in data collection) with the necessary skills in psychology and society. It is worth noting that the scientific research team confirmed this skill of interviewers. Each interview lasted for 25 minutes. Demographic questions were initially asked, followed by ten items related to the causes of delays. In this part of the interview, the interviewees had to rate items on a five-point scale, ranging from 1 = not at all important to 5 = extremely important.

### Statistical analysis

All statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) version 16. Quantitative variables were expressed as mean  $\pm$  standard

deviations or median (interquartile range), while the qualitative data were described as frequency (percentage).

## Results

Based on the results, 82.6 % of those interviewed were first-degree relatives of the deceased. The mean age of dead patients was  $64 \pm 12$  years (62.5% male and 37.5% female). The mean age by gender was 66 years for males and 65 years for females. Based on education level, the highest percentage of illiterates was reported among deceased patients (Figure 1).

While 92.4% of the dead had one or more comorbidities, the highest prevalence was for cardiovascular diseases (Figure 2). The findings on the onset of symptoms and the hospitalization leading to death showed that a physician had seen 81% of the deceased, and only 16% had been referred to a health center at least once.

Examining the effect of 10 delay causes in the hospitalization checklist (on a 3 to 5-point scale), it was reported that the highest scores pertained to the fear of hospitalization (55.8%), following the physician's advice about not referring to hospitals (44.1%), and taking herbal medicines (32.3%), respectively (Table 1).

## Discussion

The results demonstrated that most deceased patients were elderly, male, and illiterate with a history of some diseases, such as cardiovascular disease, diabetes mellitus, cancer, and hypertension. Various studies have highlighted the role of age, gender, and specific diseases

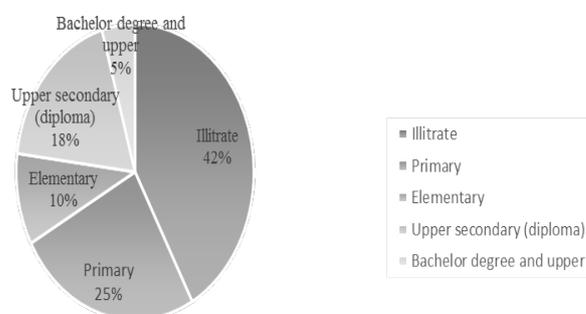


Figure 1. Education level of deceased patients

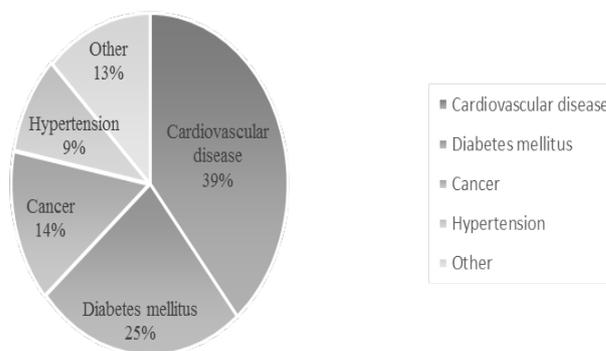


Figure 2. Prevalence of underlying diseases among the dead patients

**Table 1.** The effect of 10 delay causes in hospitalization among deceased patients

Order	Causes of delayed hospitalization	% Frequency
F	Fear of hospitalization	55.8
P	Physician's advice about not referring to hospitals	44.1
T	Taking herbal medicines	32.3
E	Economic issues	29.5
R	Reluctance to go to the hospital	29.1
L	Lack of confidence in the performance quality of the treatment staff	22
M	Media and cyberspace advise about not referring the hospital	21.5
U	Unpleasant experience of previously hospitalized patients	15.9
C	Consider unofficial news (social networks)	12.6
N	Non-acceptance by the emergency department in pre-hospitalization leads to death	12.6

in increasing mortality in patients with COVID-19. Analysis of data from nine countries indicated an increased mortality from COVID-19 in older people, especially men, compared to that in women of the same age and even general mortality patterns (3).

A systematic review (10) and an epidemiological study (11) determined specific comorbidities, such as age above 65 and hypertension, that increase COVID-19-related mortality. A systematic review and meta-analysis study documented hypertension and diabetes as significant causes of COVID-19 mortality (12). In addition, other diseases, including cancer, asthma, and heart disease, have a risk burden in COVID-19 death rates (13). Nevertheless, Alzheimer's disease was a significant factor associated with COVID-19 severity (14). Therefore, there seems to be heterogeneity between studies examining the comorbidity role and COVID-19 mortality. However, the highest mortality rates are in older age groups, men, and those with a history of chronic diseases (14); therefore, these are vulnerable populations that need a unique approach when hospitalized.

Based on the results of this study, 81% of the deceased patients, between the onset of symptoms and hospitalization leading to death, were referred to a physician at least once, while only 16% of them were referred to a health center. Moreover, the physician's advice about not referring to hospitals was one of the main reasons for delays in going there. These results can be interpreted as follows: although most of the deceased were visited by a physician, the physician did not pay sufficient attention to the potential risks in these individuals and even discouraged them from referring to hospitals. Moreover, only a limited number of patients who ultimately died were referred to the health center; therefore, it seems that training and updating physicians' knowledge of COVID-19 is critical. Furthermore, rebuilding trust in health centers and promoting extensive

education and public awareness of the health center as the first line of screening in health care can be crucial. One of the beneficial effects may be the early detection of acute cases of COVID-19 to be referred to a hospital to reduce mortality.

This is the first retrospective study examining the social causes of delayed hospitalization related to COVID-19 deaths in the first 48 hours of hospitalization. The results of the present study demonstrated that the main reasons were fear of the hospital, physicians' advice about not referring to hospitals, and taking herbal medicines, respectively. According to research and clinical observations, psychological and mental health problems dramatically increase during a pandemic (15,16). COVID-19 (the novel coronavirus) is the current worldwide pandemic declared a global public health challenge by the World Health Organization (17). A study in China found the prevalence of more than 25% of anxiety and stress in the general population with the outbreak of COVID-19 (18).

Taylor et al reported fear and anxiety in response to any stressful situation during this pandemic (19). Moreover, it was documented that education and income as socioeconomic status indicators can be negatively associated with anxiety disorders (20). In other words, lower levels of education and income are considered risk factors for experiencing anxiety, fear, or worry (21). These findings support the results of the present study in which the majority of the deceased patients were illiterate and mainly lived in low-income areas. Furthermore, fear of hospitalization was the main reason for delays; therefore, health officials must devote diligent attention to the mental health of the community, especially vulnerable groups, including people from low socioeconomic status.

As evidenced by the results of this study, the second reason for delays was taking herbal medicines. Based on demographic characteristics, it has been determined that people with higher incomes and education levels consume more herbal medicines (22). Although these results contradict the findings of the current study, where the deceased were in low-income areas and had low levels of education, this may have a possible explanation. In the current situation, COVID-19 is the main challenge of the world. Due to the unknown nature and lack of definitive treatment, most seek remedies that do not require hospitalization (23). Therefore, regardless of socioeconomic level, these complementary drugs have dramatically increased. Nonetheless, herbal remedies are not the magic bullet for COVID-19 viral disease (23). It can reduce symptoms only in mild cases; moreover, like other medications, herbal medicines bring their side effect, especially for people with underlying conditions (24,25).

Among the notable limitations of this study, we should mention the following: 1) the incompleteness of some

information files of deceased patients, 2) the reluctance of many families of the deceased patients to provide information, 3) the lack of access to informed people (including the first-degree family of the deceased), and 4) the absence of the deceased person, which reduces the accuracy of the collected information.

### Conclusion

The results of the present study pointed to the vulnerability of certain groups in the community to COVID-19 mortality. These groups at higher risk of COVID-19 complications were the elderly, males, those with underlying diseases, and those from low socioeconomic status. This finding can assist in managing medical and human resources properly to reduce hospital mortality. Furthermore, fear was the main reason for delays in referring to hospitals. It seems that the psychological aspects of COVID-19 have not been sufficiently studied, especially among vulnerable groups, and public health officials have not devoted sufficient attention to the pandemic mental health issues. Therefore, interventions in this part of COVID-19 may be a step toward reducing the mortality of this emerging pandemic.

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### Authors' Contribution

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### Competing Interests

There is nothing to declare.

### Ethical Approval

The study was conducted with the ethical approval of Kerman University of Medical Sciences (IR.KMU.REC.1403.058). Additionally, it was confirmed by the COVID-19 Mortality Committee of Mashhad University of Medical Sciences.

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