

## COVID-19 pandemic and management on hospital length of stay: A review

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### Abstract

COVID-19 virus is a serious threat to public health everywhere on the planet. The World Health Organization (WHO) declared the disease epidemic in December 2019 because of its rapid prevalence around the world. The disease is transferred by inhalation or contact with contaminated droplets, and the incubation period varies from 2 to 14 days. COVID-19 has led to unprecedented pressures as demand for healthcare in hospitals and intensive care units around the world increases. As the epidemic intensifies, determining the resulting needs for health care resources (beds, staff, equipment) has become a priority for many countries. Predicting future demand requires estimating how long COVID-19 patients must have access to different levels of hospital care. The length of hospitalization for these patients is one of the management priorities. It is possible to pass through the crisis only with careful planning and comprehensive cooperation.

### Introduction

In 2019, the 2019-nCoV or acute respiratory syndrome (SARS-CoV-2) spread from Wuhan, China, to other parts of the world.<sup>1</sup> The virus was uncontrollable and caused the deaths of many people around the world. Preliminary data show that the elderly and those with weakened immune systems are more prone to the disease, while children are less likely to get sick. Preventive measures are the best way to control this disease.<sup>2</sup> Risk factors of SARS-CoV-2 activation are relevant to the immune system suppressor, such as aging, being a man, diseases such as diabetes, cardiovascular problems, weight gain, and pre-existing viral diseases. Infectious viruses may remain hidden in the body, and they

appear at the same time as other active viruses. SARS-CoV-2 may allow the activation of these sub-viruses.<sup>3,4</sup>

The epidemic COVID-19 makes proper management and isolation essential to prevent further outbreaks in the world.<sup>5</sup> Less current symptoms at COVID-19, such as nausea, vomiting, diarrhea, are transmitted by person-to-person.<sup>6</sup> Patients with symptoms like fever, dry cough, and metabolic process distress should refer to the hospital.<sup>7</sup> Also, people who have more severe symptoms of the disease should be hospitalized to continue the treatment. Hospital systems have been challenged by the influx of patients.<sup>8</sup> Hospital care such as patient monitoring, sample testing, infection control in health centers, maintenance of necessary resources, pathways, beds, staff, and equipment required in the hospital, can affect the length of hospital stay.<sup>9</sup> Many countries have failed despite having well-equipped sanitation systems and beds in hospitals.<sup>10</sup> The increasing demand for hospital beds, as well as staff and related equipment, provides basic evidence indicating the need for careful decision-making and planning. LoS, long normal, and Weibull estimation models can be used to predict the number of beds needed by hospitalized patients.<sup>11</sup> Obviously, taking such measures is reflected in the hospital admissions and Health Information Technology (HIT), supposed to be key restrictive parameters for hospitalized patients.<sup>12</sup> The relative shortage of hospital beds and the high incidence of the disease, the increase in the risk of mortality, and the delay by physicians in the discharge of patients until full recovery, may make it difficult to identify the appropriate level of health care.<sup>13</sup> The study aims to raise awareness of the efforts made by health policymakers and hospital managers to better predict the needs of hospitalized patients while protecting them during the COVID-19 epidemic.<sup>14</sup>

### COVID-19 as a pandemic in hospitals

The disease brought by coronavirus is of the most recent crises in human society, which spread worldwide and was declared as an epidemic by WHO on March, 11, 2020. In Italy, which had the highest number of patients after China, almost two-thirds of all hospital beds were filled with COVID-19 patients within 10 days.<sup>15</sup> Thus, hospitals were placed at the forefront of the healthcare system and crisis response.<sup>16</sup> Health managers and policymakers now control and manage the situation in a different context. Identifying the challenges

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in hospitals, along with the implementation of effective strategies in the face of biological crises, can play an important role in crisis management planning.<sup>17</sup> It is also possible to extend these programs to other countries.<sup>18,19</sup> At the start of the COVID-19 pandemic, hospital managers could use the total capacity of hospital beds,<sup>18</sup> trying to discharge patients with lower priority and concentrate on more critical conditions.<sup>20</sup> Then, separate clinical centers were allocated to COVID-19 suspected patients to manage hospital patient flow.<sup>21</sup> Restrictions were also imposed on visits for the wards designated to these patients.<sup>22</sup> In addition to the restrictions and hospitalization of many patients, there were

several efforts to use the simplest accessible resources and facilities in the best way.<sup>23</sup> Accordingly, crisis management specialists coordinated closely with alternative hospitals.<sup>24</sup>

### Hospital support measures associated with the COVID-19

In the early phase of the pandemic, information on the disease was still evolving; thus, case definitions and hospital pointers were most often modified.<sup>25</sup> Hospitals became scenes of super-spreading events throughout the disease and MERS epidemic.<sup>26</sup> Outpatients and emergency groups were supposed to be at a higher risk.<sup>27</sup> All facilities were mobilized to establish elaborate strategies aimed at safe testing and effective quarantine of suspects.<sup>28</sup> Otherwise, uncertainties of those on the forefront and the increasing number of patients would turn such locations into hospital-related epidemics.<sup>29</sup> The allocation of a unit to assess medical services by an associate in nurse staffing requirements may act as a security barrier to the construction.<sup>30</sup> Sorting can be a clinical strategy to deal with patients who have acute metabolism illnesses.<sup>31</sup> For example, as in the case of associate in nurse staffing, initial testing, treating the disease, and managing different cases can be performed with voluntary home quarantine.<sup>32</sup> Then, if it does not respond, COVID-19 visits and examinations can be performed at intervals of 5 to 9 days.<sup>33</sup> The use of telemedicine or telecommunications is usually supposed to reduce the need to travel to outpatients.<sup>34</sup> Hospitals got to establish potential programs for general wards and treatment units.<sup>35</sup> Caring for patients with COVID-19 requires an associate degree and large rooms and areas to quarantine mobile contaminants, which means exceeding the available capacities.<sup>36</sup>

The adjustment of air conditioning systems is also a useful solution to deal with the crisis Worldwide.<sup>37</sup> Heating, Ventilation, and Air Conditioning (HVAC), along with waste management and handling, have been at the center of attention in public departments to manage patients with COVID-19.<sup>38</sup> Pharmacies and private offices face particular challenges due to the lack of capabilities for quarantine and testing.<sup>39</sup> An efficient flow of patient testing and referrals is very important, and the cooperation of competent public health professionals with society is required to support healthcare foundations effectively.<sup>40</sup>

### Communications and management of patients, visitors, and staff

At the early phase of virus prevalence, hospital guidelines often underwent revisions.<sup>41</sup> Now, strict measures of isolation and protection are the main priorities to deal with this disease.<sup>42</sup> Nurses are provided with online training on how to protect against and prevent coronavirus infection in their hospitals to increase staff awareness and communication<sup>43</sup> (Figure 1). Coordination between all employees is also necessary.<sup>44</sup> All staff should report their respiratory symptoms and body temperature before and after exposure to patients with COVID-19 while avoiding entrance into unnecessary wards.<sup>45</sup> The staff must carry out all programs according to the instructions given by the hospital manager.<sup>46</sup>

### Patient management

Managers focused on discharging

patients who had better conditions through international agencies or taking their admission to completely different hospitals or clinics so that they could take advantage of the hospital's full capacity.<sup>47</sup> The closure of the operation rooms and rejection of elective patients aimed at prevent patient flow to the hospitals.<sup>48</sup> Also, COVID-19 suspected patients were assigned distinct clinical centers providing visits and administrative procedures.<sup>49</sup> A follow-up center was also established for those patients who received care, but their administrative unit did not institutionalize the reception process.<sup>50</sup> Patients admitted at home had access to routine contacts and residential care nursing groups when required.<sup>51</sup> the Red Crescent Society and other volunteers helped in the establishment of patient centers.<sup>52</sup> Visits of the wards in which COVID-19 patients were hospitalized were also restricted or prohibited (Figure 2).<sup>53</sup>

**Patient position:** Must be manufactured to isolate patients with doubtful or established COVID-19.<sup>54</sup>

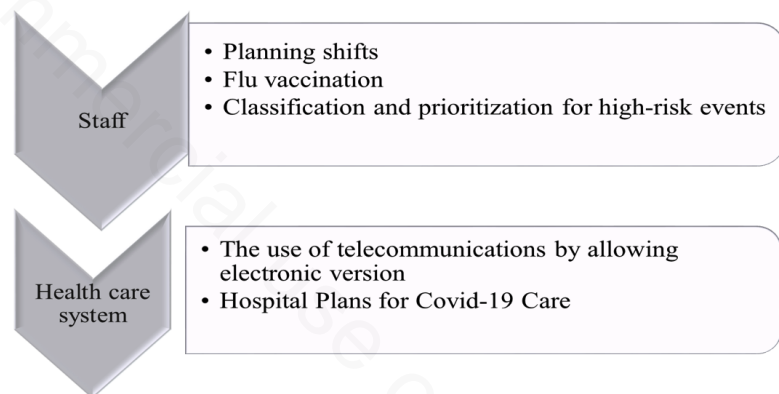


Figure 1. Proposals for hospital.

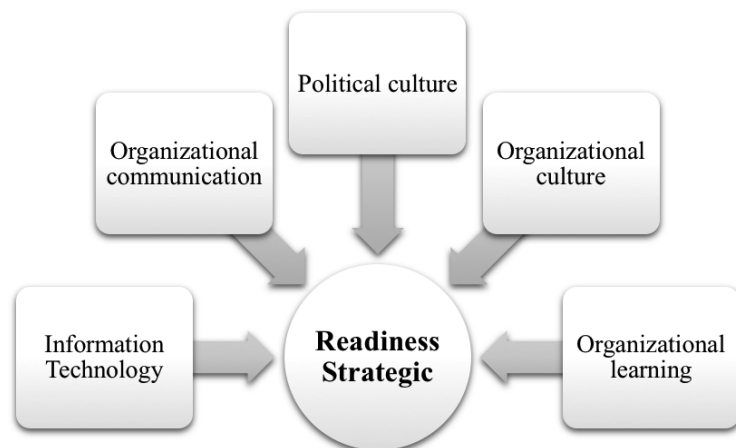


Figure 2. Theoretical topics of research in the hospital.

**Patient education:** Napkins should be prepared and patiently instructed to cover the nose and mouth.<sup>55</sup>

## Management of items and facilities

Considering the constraints, together with higher chances of hospitalization within the next phases of the pandemic, the attempt was made to use the available resources and equipment effectively.<sup>56</sup> Accordingly, in addition to the effective use of the resources and provisions, the consultants in crisis management coordinated with alternative hospitals to arrange donations and fund facilities such as personal protection kits, masks, gloves, and disinfectants.<sup>57</sup> Also, because of the lack of resources and facilities to treat infected individuals, specialized hospitals such as medicine or medical specialty centers need exclusion from the cycle of the fight against the pandemic.<sup>58</sup> As the patient variety increases, coordination with alternative establishments is necessary to create field hospitals.<sup>59</sup>

## Conclusions

Nowadays, the diffusion of up to date on the latest information on COVID-19 is an important method that can into the performance of self-care guidance. Control of this disease requires society's involvement and presentation information about COVID-19 to the society has a key role in managing critical conditions<sup>60</sup> The prevalence of the novel virus has challenged the infrastructure of many countries in the world, affecting the lives of all humans.<sup>61</sup> Moreover, we need to consider the behavioral variations of COVID-19, and its long-term effects in the human body.<sup>62</sup> Emergency and disaster readiness is an important and global issue.<sup>63</sup> Most hospitals are unable to maintain their normal operations for a week due to a lack of disaster-related resources.<sup>64</sup> However, it is possible to overcome the epidemic with the necessary preparations and the coordination and cooperation of all hospital departments, including staff, doctors, and nurses.<sup>65</sup> In this review study, the hospital system monitored staff performance to detect significant changes and take appropriate measures for patients admitted to COVID-19 wards.<sup>66</sup> To change the patients' length of stay in the hospital, it is important to use hospital management techniques and coordinate with health centers in the community.<sup>67</sup> Adherence to protocols, health and care

guidelines, and social distancing between people can decrease virus infection cases.<sup>68</sup> Compliance with the principles of health and self-care make it possible to prevent acute cases of the disease and hospitalization.<sup>69</sup>

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