

The impact of COVID-19 on the waste amount and distribution in city hospitals of Türkiye

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Abstract

COVID-19 hit the globe from every angle at the end of 2019 and increased healthcare activities (Hanedar, 2020). The rapidly increasing number of patients infected with COVID-19 and the highly transmissible nature of the disease resulted in a high number of hospitalizations. Excessive medical waste emerged as a major threat to public health and the environment during the epidemic (Das et al., 2021). This increase in health activities affected health institutions the most. The previous studies mainly addressed the impact of COVID-19 on the quantity of medical waste while the quantities of various waste types remain limited. This study aimed to evaluate the impact of COVID-19 on the amount and distribution of waste in hospital units in different cities in Türkiye. The research was carried out in Manisa and Yozgat City Hospitals (CHs) because these hospitals had sufficient staff and waste was weighed regularly and recorded before and during the COVID-19 pandemic.

The waste generated in Manisa and Yozgat CHs was collected in 4 categories including municipal, medical, hazardous, and packaging waste. In these hospitals, waste is primarily collected separately at the source and transported to waste storage rooms. After these wastes are taken into larger containers in the waste rooms, they are brought to the weighing area using a waste transportation route. In the weighing area, separately collected wastes are weighed according to waste type and taken to temporary storage areas where the waste is stored. The data is recorded in the hospital waste management system. The waste data collected from the hospitals was used in the study to compare 2019 (before COVID-19) and 2020 (during COVID-19). In the study for each waste type, the daily waste amounts per bed were calculated according to Equation 1.

$$\text{Waste amount per bed } \left(\frac{\text{kg}}{\text{bed} \cdot \text{day}} \right) = \text{Total waste amount} / \text{Number of beds} \quad \text{Eq.1}$$

According to the results, the amount of municipal waste in the hospitals varied between 3.21-3.53 kg/bed-day before COVID-19, it reduced to 1.76 kg/bed-day in Yozgat CH while it remained constant (3.16 kg/bed-day in Manisa CH) during COVID-19 (Figure 1) The units that generated the most municipal waste in Yozgat CH were the dining hall (2019) and the polyclinic (2020). The quantity of medical waste was determined as 1.11-1.32 kg/bed-day before COVID-19 for Manisa and Yozgat CHs, respectively. As Esen (2021) stated, hospitals in Türkiye had medical waste in the range of 1.25-1.43 kg, which is similar to this study's findings. During the pandemic, medical waste increased to 1.91 and 1.73 kg/bed-day, respectively. A greater increase was observed in other countries. For instance, medical waste generated in Wuhan Hospital, China, was tripled from 0.7 kg/bed-day to 2 kg/bed-day (ISWA, 2020). The medical waste amount increased during the COVID-19 pandemic in CHs as expected. The breakdown of distribution revealed varying rates of increase in medical waste generation across different units. The intensive care, emergency services, and laboratory units in both hospitals produced the most medical waste.

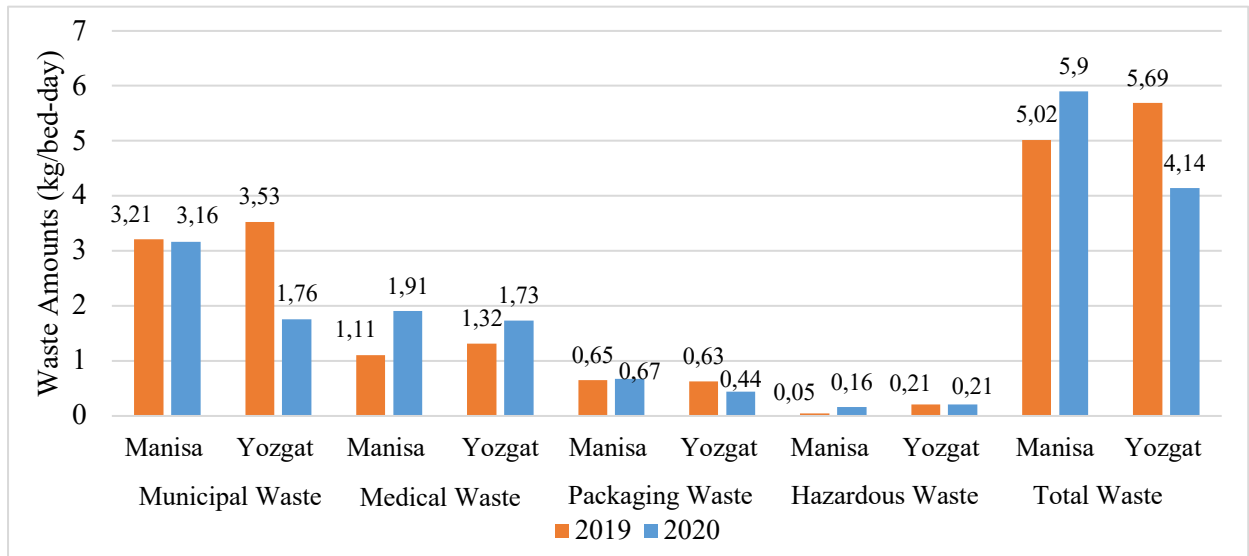


Figure 1. Amount of municipal, medical, hazardous, packaging, and total waste in Manisa and Yozgat city hospitals.

The amount of packaging waste varied between 0.63-0.65 kg/bed-day before COVID-19, it showed a decreasing trend in Yozgat CH (0.44 kg/bed-day while it did not change significantly in Manisa CH (0.67 kg/bed-day) during COVID-19. Hazardous waste increased from 0.05 kg/bed-day to 0.16 kg/bed-day during COVID-19 for Manisa CH and it remained constant (0.21 kg/bed-day) for Yozgat CH. The units that generated the most hazardous waste were the laboratory in Manisa CH (2019, 2020), and the laboratory (2019) and intensive care units (2020) in Yozgat CH. While the total waste amount in Manisa CH increased from 5.02 kg/bed-day to 5.69 kg/bed-day during COVID-19, it decreased from 5.9 kg/bed-day to 4.14 kg/bed-day in Yozgat CH due to a reduction in municipal waste.

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