

## Has the COVID-19 Pandemic Affected Homeless Patients Visiting the Emergency Department?

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### ABSTRACT

**Objective:** Our aim was to compare emergency department visits among homeless patients before and during the COVID-19 pandemic.

**Material and Methods:** We retrospectively examined data from homeless patients who visited a city hospital's emergency department in Istanbul between March 11, 2018, and March 10, 2022. The study included patients over 18 years old who were registered in the hospital's automation system as "homeless" or "living on the street," and who had sought social service support. Descriptive statistics, Student's t-test, Mann-Whitney U test, chi-squared test, Fisher's exact chi-squared test, Fisher-Freeman-Halton exact chi-squared test, and Yates continuity correction test were utilized for data analysis.

**Results:** The study encompassed a total of 105 homeless patients, with 85 (81%) being male and aged between 18 and 88 years. The mean age was 44.54±16.25 years. Of the patients, 21.9% visited the emergency department before the pandemic, and 78.1% visited during the pandemic. Among homeless patients suspected of COVID-19, 20% who visited the emergency department tested positive for the polymerase chain reaction (PCR) test.

**Conclusion:** Our findings indicate an increase in the number of homeless patients seeking care in the emergency department during the COVID-19 pandemic.

**Keywords:** Homeless patient, emergency department, pandemic, COVID-19

### INTRODUCTION

Coronavirus is transmitted through saliva droplets or nasal discharge when an infected person sneezes or coughs, causing respiratory diseases ranging from inflammatory symptoms in the upper respiratory tract to fatal severe pneumonia (1,2). Homeless people are a vulnerable group living in unsuitable conditions (e.g., on the streets, in parks, in abandoned buildings and shelters) and without regular access to basic hygiene items or shower facilities. However, in addition to this definition, this group also encompasses individuals residing in public housing settings (such as train stations, terminals, budget lodgings, and addiction treatment centers) or those who lack a place to stay upon discharge from healthcare facilities (3). Homeless people are at potential risk of serious health problems because they live in unsheltered places and are easily affected by diseases. Poor conditions without specific prevention measures can facilitate the transmission of viruses (4).

Homelessness is divided into different classes. One of the classifications of homeless people was made by Ziefert and Brown. According to this classification, there are chronically, situationally, and marginally homeless people. Chronically homeless are people who have been homeless for more than a year; situationally homeless are people who are homeless, often due to job loss or problems with friends and family; and marginally homeless refers to people who are homeless due to mental health problems and substance abuse (5,6).

### Research Article

Received 23-07-2023

Accepted 21-08-2023

Available Online: 24-08-2023

Published 30-08-2023

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It can be said that chronic, physical, and mental illnesses are common among most homeless people, and this group is one of the highest risk groups for severe respiratory failure syndrome, which can be caused by COVID-19 (2).

Studies of homeless people have found limited data on the COVID-19 pandemic (7,8). In addition, hospital visits and admissions of homeless people in emergency departments before and during the pandemic have not been adequately studied. The objective of this study is to compare the emergency department visits of homeless patients before and during the COVID-19 pandemic.

## MATERIAL and METHODS

### Study Design

This study is planned as a descriptive and retrospective study. The study included patients aged 18 years and older who described themselves as homeless, had a history of being registered as "homeless" or "living on the streets" in their anamnesis, or were orphaned and consulted to social services for suspected homelessness. The study included individuals categorized as chronically homeless, situationally homeless, and marginally homeless, while patients residing in civic shelters and private institutions were excluded.

### Time period

The data used in our study were obtained by electronically scanning the hospital records of patients who visited the emergency department of a tertiary city hospital in Istanbul between 11 March 2018 and 10 March 2022. To compare the period before and during the pandemic, 11 March 2020, the date on which WHO declared the pandemic, was used. The pre-pandemic period was chosen between 11 March 2018 and 10 March 2020. In order to synchronize the comparison periods, the post-pandemic timeframe was confined to March 11, 2020, to March 10, 2022.

In Turkey, under Ministry of Health legislation, there is a triage coding system in red, yellow, and green to determine the priority order of emergency patients. Patients who need an outpatient examination in the emergency department are placed in the green zone, those with potentially serious conditions are placed in the yellow zone, and those with life-threatening conditions are placed in the red zone (9). Patients with suspected COVID-19 were given a triage code in the yellow zone at the hospital where the study was conducted during the pandemic.

Based on the date ranges defined above, patients were divided into two groups as pre-pandemic and during-pandemic. For the purpose of comparing the frequency of ED visits between these two categories of homeless patients due to the

pandemic, parameters including age, gender, admission complaints, hospitalization location, diagnosis, and requested consultations were electronically extracted from the hospital database. Ethical Aspect of the Research

Before the research began, Cemil Tascioglu City Hospital Clinical Research Ethics Committee's approval was obtained under number 48670771-514.99.

### Statistical Analysis:

In evaluating the findings obtained in the study, IBM SPSS Statistics 22 software was used for statistical analysis. The suitability of the parameters with the normal distribution was evaluated by Kolmogorov-Smirnov and Shapiro-Wilks tests. In addition to descriptive statistical methods (mean, standard deviation, frequency, median), Student's t-test for the comparison of normally distributed parameters between two groups and the Mann Whitney U-test for the comparison of non-normally distributed parameters between two groups were used to evaluate the study data. Chi-squared test, Fisher's exact chi-squared test, Fisher Freeman Halton exact chi-squared test, and Yates continuity correction were used to compare qualitative data. Significance was assessed as  $p < 0.05$ .

## RESULTS

The study was conducted with a total of 105 homeless patients aged between 18 and 88 years, 85 (81%) male and 20 (19%) female. The mean age was  $44.54 \pm 16.25$  years. The results of the PCR test obtained from the patients who came with suspicion of COVID-19 were negative in 80% and the test result was positive in 20%.

While there was no significant difference in sex distribution, mean age, time of visit, and outcome of patients admitted before and during the pandemic ( $p > 0.05$ ), a significant difference was found in indications ( $p: 0.038$ ;  $p < 0.05$ ). While rates of ED visits with neurological system (30.4%) and substance use (26.1%) indications were high before the pandemic, rates of ED visits with alcohol use (20.7%) and suspected COVID-19 (12.2%) were high during the pandemic (**Table 1**).

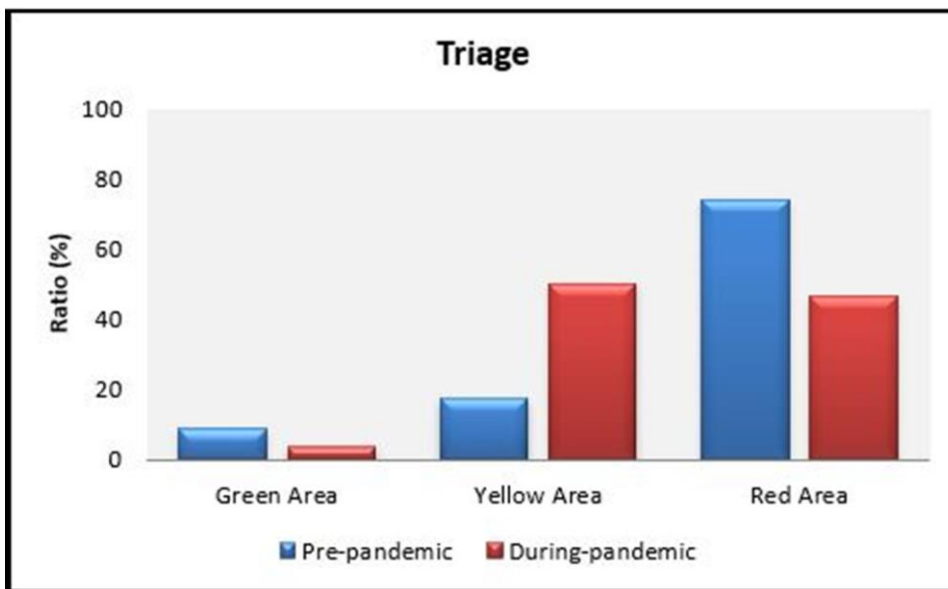
There was a significant difference in triage color coding before and during the pandemic ( $p: 0.012$ ;  $p < 0.05$ ). While yellow triage coding (50%) was high during the pandemic; red triage coding (73.9%) was found to be high before the pandemic (**Figure 1**).

There is no significant difference in terms of the frequency of imaging modalities and consultations before and during the pandemic ( $p > 0.05$ ) (**Table 2**).

**Table 1:** Comparison of pre-pandemic and during-pandemic parameters

		Pre-pandemic (n=23) n (%)	During-pandemic (n=82) n (%)	P
Time of visit	00:01-06:00	4 (17,4%)	23 (28,1%)	<sup>1</sup> 0,422
	06:01-12:00	5 (21,7%)	22 (26,8%)	
	12:01-18:00	8 (34,8%)	16 (19,5%)	
	18:01-24:00	6 (26,1%)	21 (25,6%)	
Indications	Neurological system	7 (30,4%)	13 (15,9%)	<sup>2</sup> 0,038*
	Substance use	6 (26,1%)	8 (9,8%)	
	Gastrointestinal system	3 (13,0%)	3 (3,7%)	
	Trauma	2 (8,7%)	8 (9,8%)	
	Respiratory system	2 (8,7%)	4 (4,9%)	
	Cardiovascular system	1 (4,3%)	7 (8,5%)	
	Pain	1 (4,3%)	4 (4,9%)	
	COVID-19 suspicion	1 (4,3%)	10 (12, 2%)	
	Alcohol use	0 (0%)	17 (20,7%)	
	Assault	0 (0%)	4 (4,9%)	
	Other	0 (0%)	4 (4,9%)	
	Outcome	Discharge	11 (47,8%)	
Unauthorized leave		5 (21,7%)	7 (8,5%)	
Intensive care		3 (13%)	8 (9,8%)	
Death		3 (13%)	4 (4,9%)	
Refusal of treatment		1 (4,3%)	12 (14,6%)	
Service		0 (0%)	10 (12,2%)	
Mean of arrival	On foot	12 (52,2%)	43 (52,4%)	<sup>2</sup> 0,699
	112 Ambulance	8 (34,8%)	32 (39%)	
	Other vehicles	3 (13%)	7 (8,5%)	
Sex	Male	18 (78,3%)	67 (81,7%)	<sup>3</sup> 0,766
	Female	5 (21,7%)	15 (18,3%)	
Age	Mean±SD*	42,39±16,72	45,15±16,17	<sup>4</sup> 0,475

\*SD: standard deviation <sup>1</sup>Chi-squared test <sup>2</sup>Fisher Freeman Halton Exact Test <sup>3</sup>Fisher’s Exact Test <sup>4</sup>Student’s t-test \*p<0.05



**Figure 1:** Triage color coding

**Table 2:** Distribution of requested imaging techniques and consultations pre and during the pandemic

		Pre-pandemic (n=23)	During-pandemic (n=82)	P
		n (%)	n (%)	
Imaging Technique	CT*	15 (65,2%)	56 (68,3%)	+0,979
	MRI**	5 (21,7%)	8 (9,8%)	0,153
	USG***	4 (17,4%)	9 (11,0%)	0,475
Consultations Requested	Internal medicine	4 (17,4%)	5 (6,1%)	0,103
	Anesthesia	3 (13,0%)	9 (11,0%)	0,723
	Neurosurgery	3 (13,0%)	8 (9,8%)	0,702
	Neurology	3 (13,0%)	6 (7,3%)	0,407
	Plastic and reconstructive surgery	2 (8,7%)	6 (7,3%)	1,000
	Pulmonary medicine	1 (4,3%)	1(1,2%)	0,392
	Orthopedics and traumatology	1 (4,3%)	5 (6,1%)	1,000
	Infection	0 (0%)	7(8,5%)	0,343
	Otorhinolaryngology	0 (0%)	3 (3,7%)	1,000
	Cardiovascular surgery	0 (0%)	3 (3,7%)	1,000
	Cardiology	0 (0%)	2 (2,4%)	1,000
	Ophthalmology	0 (0%)	1 (1,2%)	1,000
	Dermatology	0 (0%)	1 (1,2%)	1,000

Fisher’s Exact Test + Yates continuity correction

\* CT: Computerized Tomography

\*\* MRI: Magnetic Resonance Imaging

\*\*\* USG: Ultrasonography

## DISCUSSION

Our study found that the number of homeless patients who contacted emergency services during the pandemic increased compared to the pre-pandemic period. A study conducted in the USA reported that the rate of 128 homeless patients visiting the emergency department at least once during the pandemic was 34% (10). In a study conducted on the general population, it was noted that visits to the emergency department by homeless patients remained unchanged during the pandemic (11). In Keller et al.'s study of homeless and non-homeless patients visiting the emergency department during the pandemic, they mentioned that the rate of homeless patients visiting the emergency department during the pandemic was 18.1%(12). In this study, the positivity rate of PCR tests in homeless patients was 20%. In a study conducted in the USA, the positivity rate of COVID-19 test results from homeless patients visiting the emergency department was found to be 5.5%.(12).A study conducted in Boston, USA reported that the PCR test was positive in 147 (36.02%) of 408 homeless patients living in shelters (13). It is believed that homeless people have little or no opportunity for effective isolation or quarantine measures during the period when the general society is in lockdown for protection from COVID-19, which increases the likelihood of infection. In our study, 47.8% of homeless patients who visited the emergency department before the pandemic were discharged after treatment, 21.7% left the hospital without permission, 13% were admitted to the intensive care unit, 13% were fatal and 4.3% refused treatment. In a study by Kılıç et al., it was observed that 9.2% of homeless patients who sought care in the emergency department were subsequently admitted to the intensive care unit (ICU) (14). In the study conducted by Yalçınlı et al. on patients who needed medico-social service assessments in the emergency department, it was found that 2.1% of patients died (15).

In our study, we discovered that 50% of homeless patients who visited the emergency department during the pandemic were discharged. In the study conducted by Keller et al. during the pandemic, it was found that 79.5% of homeless patients were discharged (12). In the study conducted by Husain et al. in France during the pandemic, it was found that 5.6% of treated cases resulted in death (16). In our study, similar to the study by Husain et al, 4.9% of homeless patients who visited the emergency department during the pandemic ended in death. Homeless people are more vulnerable than the general population and have a higher risk of illness and mortality. The general life expectancy of these people has been reported as 17.5 to 30 years lower (16). The mortality rate of homeless adults is almost four times higher than that of the general population, for ill-defined reasons (17).

Neurological disorders, hypertension, gastrointestinal problems, joint diseases, skin diseases, respiratory system diseases, drug and alcohol addiction, and trauma-related health problems are common among homeless people (18). In our study, the most common indications for homeless patients visiting the emergency department before the pandemic was neurological system (30.4%) and substance use (26.1%). The most common indications during the pandemic were alcohol use (20.7%) and suspected COVID-19 (12.2%). In the study conducted by Kılıç et al. in Turkey, focusing on homeless patients who presented to the emergency department, the most prevalent indications were cardiovascular and respiratory issues, accounting for 42.3%, followed by neurological system indications at 12.4% (14). In the study by Yalçınlı et al. in which homeless patients who needed medico-social service assessments were admitted to the emergency department, it was found that 18.1% of the patients had a psychiatric disorder and 5.3% had substance use (15).

In the study by Sert et al. in which they analyzed the last 5 years of patients reporting to the emergency department, covering the period before the pandemic, it was found that the most common report was related to respiratory system diseases at a rate of 24.7% (19).

In the study by Kuitunen et al. that examined emergency department visits by the general population, the reasons for patient admissions changed before and during quarantine. The most common reasons for inpatient admissions during the quarantine were trauma, respiratory illness, and other cardiac conditions, while visits for symptoms such as hip pain, urinary tract infections, and infectious diseases decreased (20). The report that examined emergency department visits in the US during the pandemic reported that the rate of emergency department visits due to communicable disease concerns (i.e. exposure, encounter, screening, or contact with a communicable disease) was higher than pre-pandemic (21). In a study analyzing emergency department visits among homeless women during the pandemic, the reported visit rate for any chronic medical condition (such as HIV, cardiovascular disease, diabetes, asthma, emphysema) was 80% (10). Giamello et al. reported a significant decrease in emergency department access for hip pain, general malaise, arthralgia, dizziness, and other non-emergency conditions, with an expected significant increase in pneumonia and significant stability of respiratory failure, sepsis, and fever (22). Another study conducted in the USA reported ED visits in the early pandemic due to the symptoms of COVID-19, pneumonia (not caused by tuberculosis), unspecified lower respiratory illness, respiratory failure or arrest, cardiac arrest, and ventricular fibrillation, as well as decrease in cases of abdominal pain, nausea, vomiting, hip pain and hypertension (23). It is fair to say that there are similar results in other studies.

### Research Implications

It aimed to compare the emergency room admissions of homeless patients before and during the COVID-19 pandemic. Our study revealed an increase in the number of homeless patient visits to the emergency department during the COVID-19 pandemic. With the increase in applications, it was understood that this vulnerable group, which is difficult to protect in situations like pandemics, felt the need for more healthcare services. More studies are needed to design strategies for homeless patients.

### Limitations

Retrospective data collection from a single center is the limitation of this study. Data from only one emergency department cannot be generalized to the country. However, the hospital where the study was conducted is one of the urban hospitals with a significant number of patient visits in Turkey; it is also a hospital where patients with low socioeconomic status turn to.

## CONCLUSION

Our study concludes that the number of homeless patients visiting the emergency department during the COVID-19 pandemic has increased. The pandemic, with its adverse effects on all segments of society, has contributed to a rise in health issues among homeless patients.

**Acknowledgements:** The authors would like to thank Mr. Atilla Yuna for data processing for this paper.

**Conflict of interest:** The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Author Contributions:** **PI, AS, ST, MCO, HS** contributed to the conception of the work, execution of the study, revision of the draft, approval of the final manuscript version, and concur with all aspects of the work. **AS:** Revisions. All authors have reviewed the manuscript, and affirm that they fulfill the ICMJE criteria for authorship.

**Ethical approval:** All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and/or with the Helsinki Declaration of 1964 and later versions.

## REFERENCES

- Hibino S, Hayashida K. Modifiable Host Factors for the Prevention and Treatment of COVID-19: Diet and Lifestyle / diet and lifestyle factors in the prevention of COVID-19. *Nutrients*. 2022;14.
- Wu Z, McGoogan JM. Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) outbreak in China: Summary of a report of 72314 cases from the Chinese center for disease control and prevention. *JAMA - J Am Med Assoc*. 2020;323(13):1239–42.
- Jack T, Michal W. COVID-19: a potential public health problem for homeless populations. *Comment*. 2020;5(April):186–7.
- Peate I. Self-isolation and the homeless population. *Br J Nurs*. 2020;29(7):387.
- Ziefert M, Brown KS. Skill building for effective intervention with homeless families. *Fam Soc J Contemp Soc Serv*. 1991;72(4):212–9.
- Sipahi EB, Arslan T. The relationship between homelessness problem and pandemic in addition to their reflections in Turkey. *Süleyman Demirel University Visionary J*. 2021;12(31):972–87.
- Rogers JH, Link AC, McCulloch D, Brandstetter E, Newman KL, Jackson ML, et al. Characteristics of COVID-19 in homeless shelters. *Ann Intern Med*. 2021;174(1):42–9.
- Tobolowsky FA, Gonzales E, Self JL, Rao CY, Keating R, Marx GE, et al. COVID-19 Outbreak among three affiliated homeless service sites. *MMWR Morb Mortal Wkly Rep [Internet]*. 2020;69(17):523–6. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7206987/>
- Presidency of the Republic of Turkey Regulatory Information System. Available from: <https://www.mevzuat.gov.tr/anasayfa/MevzuatFihristDetayIframe?MevzuatTur=9&MevzuatNo=13494&MevzuatTertip=5> (Access date: 09.08.2022).
- Riley ED, Raven MC, Dilworth SE, Braun C, Imbert E, Doran KM. Using a “Big Events” framework to understand emergency department use among women experiencing homelessness or housing instability in San Francisco during the COVID-19 pandemic. *Int J Drug Policy*. 2021;97(January):1–4.
- Castillo EM, Brennan JJ, Cronin AO, Killeen JP, Vilke GM. COVID-19 Symptoms among Emergency Department Patients and Implications for Screening. *Ann Emerg Med*. 2020 Oct;76(4):S66–7. doi: 10.1016/j.annemergmed.2020.09.183. Epub 2020 Oct 29. PMID: PMC7598731.
- Keller M, Shreffler J, Wilmes K, Polites A, Huecker M. Equal incidence of COVID-19 among homeless and non-homeless ED patients when controlling for confounders. *Am J Emerg Med*. 2022;53:286.e5-286.e7.

13. Baggett TP, Keyes H, Sporn N, Gaeta JM. Prevalence of SARS-CoV-2 Infection in residents of a large homeless shelter in Boston. *JAMA - J Am Med Assoc.* 2020;323(21):2191–2.
14. Kılıç TY, Yeşilaras M, Atilla ÖD, Tokar İ, Temizyürek Z. Homeless Patients in the Emergency Department. *J Acad Emerg Med.* 2015;14:70–4.
15. Yalçınlı S, Karbek Akarca F, Yerdelen B. Retrospective evaluation of patients who need social service interview in emergency department. *Ege Journal of Medicine.* 2021;60(4):402–6.
16. Husain M, Rachline A, Cousien A, Rolland S, Rouzard C, Ferre VM, et al. Impact of the COVID-19 pandemic on the homeless: results from a retrospective closed cohort in France (March-May 2020). *Clin Microbiol Infect.* 2021 Oct;27(10):1520.e1-1520.e5. doi: 10.1016/j.cmi.2021.05.039. Epub 2021 Jun 7. PMID: 34111590; PMCID: PMC8182982.
17. Güven S, Aydın Avcı İ. Vulnerable groups, risk management and the role of public health nurse. *J of Samsun Health Science.* 2019;4(1):14–22.
18. İlhan N, Ergün A. Homeless people and community health. *J of Social Policy Studies.* 2010;20(20):79–90.
19. Sert ET, Mutlu H, Yeşildağ K, Kokulu K, Sarıtaş A. 5-Year analysis of patients admitted to our emergency department. *Med J of Mugla Sitki Kocman University.* 2021;8(1):1–4.
20. Kuitunen I, Ponkilainen VT, Launonen AP, Reito A, Hevonkorpi TP, Paloneva J, et al. The effect of national lockdown due to COVID-19 on emergency department visits. *Scand J Trauma Resusc Emerg Med.* 2020;28(1):1–8.
21. Adjemian J, Hartnett KP, Kite-Powell A, DeVies J, Azondekon R, Radhakrishnan L, et al. Update: COVID-19 Pandemic-associated changes in emergency department visits — United States, December 2020–January 2021. *MMWR Surveill Summ.* 2021;70(15):552–6.
22. Giamello JD, Abram S, Bernardi S, Lauria G. The emergency department in the COVID-19 era. Who are we missing? *Eur J Emerg Med.* 2020;27(5):305–6.
23. Hartnett KP, Kite-Powell A, DeVies J, Coletta MA, Boehmer TK, Adjemian J, et al. Impact of the COVID-19 Pandemic on emergency department visits — United States, January 1, 2019–May 30, 2020. *Morb Mortal Wkly Rep [Internet].* 2020;69(23):699–704.

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