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EVALUATION OF BINGOL 112 EMERGENCY HEALTH SERVICES

BİNGÖL 112 ACİL SAĞLIK HİZMETLERİNİN DEĞELENDİRİLMESİ

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ABSTRACT

Objective: It is aimed to in this study, to determine the distribution of the pre-hospital emergency health services provided by 112 Emergency Health Services Stations in Bingöl in 2019, 2020 and 2021 according to the number of cases, location of the cases, gender, reasons for the call, pre-diagnosis, the way the cases were concluded and show the changes over the years. In addition, it was aimed to make national and international comparisons with the findings obtained and to evaluate the impact of the pandemic on pre-hospital emergency health services.

Method: This study is a retrospective descriptive study. Within the scope of the study, the data of the 112 Emergency Health Services Stations in Bingöl for the years 2019, 2020 and 2021 were examined through the Emergency Health Automation System (ASOS). The calls given to the stations, the reasons for the call, the distribution according to gender and months, the preliminary diagnoses and the outcome of the cases were evaluated.

Results: In Bingöl, the number of cases in 2020 increased by 41.8% compared to 2019, and the number of cases in 2021 decreased by 7.0% compared to 2020. In 2019, emergency calls were most common in the 18-34 age group (25.2%), while in 2020 (27.1%) and 2021 (25.8%), they were most common in the 65 and over age group. While the most common prediagnosis was cardiovascular diseases (12.84%) in 2019, Covid 19 and related diagnoses were the most common in 2020 (28.4%) and 2021 (21.5%).

Conclusion: Due to the pandemic, the number of emergency calls has increased significantly. While the population per 112 station in Bingöl is half of the Turkey average, the number of cases per station is below the Turkey average. It is important to take into account regional differences and population density in emergency health services.

Key Words: Emergency Health Services, 112, Ambulance, Pre-Hospital Emergency Health Services

ÖZ

Amaç: Bu çalışmada Bingöl'deki 112 Acil Sağlık Hizmetleri İstasyonları'nın 2019, 2020 ve 2021 yıllarında verdikleri hastane öncesi acil sağlık hizmetlerinin, vaka sayılarına, vakaların yerleşimine, cinsiyete, çağrı nedenlerine, ön tanılara, vakaların sonuçlanma biçimine göre dağılımlarını saptamak ve yıllara göre değişimini göstermek amaçlandı. Ayrıca elde edilen bulgular ile ulusal ve uluslararası karşılaştırmalar yapmak, pandeminin hastane öncesi acil sağlık hizmetlerine etkisini değerlendirmek amaçlandı.

Yöntem: Bu çalışma retrospektif tanımlayıcı bir araştırmadır. Çalışma kapsamında Bingöl'deki 112 Acil Sağlık Hizmetleri İstasyonları'nın 2019, 2020 ve 2021 yıllarına ait verileri Acil Sağlık Otomasyon Sistemi (ASOS) üzerinden incelendi. İstasyonlara verilen çağrılar, çağrı nedenleri, cinsiyete ve aylara göre dağılımı, ön tanılar ve vakaların sonuçlanma durumu değerlendirildi.

Bulgular: Bingöl'de 2020 yılındaki vaka sayısı 2019 yılına göre %41,8 artmış, 2021 yılındaki vaka sayısı 2020 yılına göre %7,0 azalmıştı. 2019 yılında acil çağrılar en sık 18-34 yaş grubunda (%25,2) gerçekleşmişken 2020 (%27,1) ve 2021 (25,8) yıllarında en sık 65 ve üstü yaş grubunda gerçekleşmiştir. 2019 yılında en sık görülen ön tanı kardiyovasküler hastalıklar (%12,84) iken 2020 (%28,4) ve 2021 (%21,5) yıllarında en sık Covid 19 ve ilişkili tanılar görülmüştür.

Sonuç: Pandemi nedeniyle acil çağrı sayıları belirgin olarak artmıştır. Bingöl'de 112 istasyonu başına düşen nüfus Türkiye ortalamasının yarısı kadar iken istasyon başına düşen vaka sayısı Türkiye ortalamasının altındadır. Acil sağlık hizmetlerinde bölgesel farklılıkların ve nüfus yoğunluğunun dikkate alınması önemlidir.

Anahtar Kelimeler: Acil Sağlık Hizmetleri, 112, Ambulans, Hastane Öncesi Acil Sağlık Hizmetleri

INTRODUCTION

Health services are the services provided to citizens through health systems organized to protect and improve the health of the individual, to raise the health level of the society and ultimately to ensure that the individual lives a quality and long life [1]. Pre-hospital emergency health services are an important and vital component of health services as they provide early medical care to injured and critically ill patients in the field [2]. Pre-hospital emergency health services refer to the provision of emergency aid-care to individuals in need of emergency assistance in cases such as disasters, accidents or sudden health problems and their safe transportation to the hospital [3]. With the rapid and effective provision of prehospital emergency health services, morbidity and mortality rates due to trauma, chronic diseases and acute conditions can be reduced and survival and quality of life can be increased [2,3]. While epidemics and infectious diseases and

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related deaths were the most important health problems until the post-World War II period, the health level of individuals has improved and life expectancy has increased with the effect of factors such as urbanization, immunization, healthy food and water supply, and collective living culture. With the increase in life expectancy, chronic diseases such as hypertension, diabetes, stroke, cardiovascular diseases and COPD have become more common. Today, new emerging infectious diseases along with chronic diseases cause significant epidemics and deaths [1,4,5]. According to World Health Organization (WHO) data, the most common causes of death today are cardiovascular diseases, stroke, respiratory system diseases, cancers, tobacco and alcohol consumption and traffic accidents. In 2019, approximately 55 million people lost their lives due to these causes [6].

Today, factors such as scientific and technological developments, socio-demographic changes, and improved living conditions have contributed positively to human life, but have also brought many health problems such as accidents, serious injuries, acute or chronic diseases, and poisoning that threaten human life [7,8]. These health threats may cause injury, disability or death of individuals. Health problems such as cardiac arrest, stroke, severe trauma, obstetric emergencies, MI, airway obstruction, sepsis cause serious disability and early death [9,10]. Appropriate intervention as soon as possible in acute and serious life-threatening situations is very important [8]. Prehospital emergency health services play a major role in reducing morbidity and mortality in common emergencies, increasing recovery and survival, and contributing to the development of prehospital emergency health services as well as increasing their importance. Therefore, it is important to evaluate the organizational structure and service delivery in order to ensure that emergency health services are provided in an equal, accessible, efficient and equitable manner throughout the country [7,8,10,11].

In Turkey, pre-hospital emergency health services are provided free of charge by 112 ambulances. Emergency health services are provided in 81 provinces through 112 emergency health services stations affiliated to provincial ambulance service chief physicians. Although there are general practitioners (A1) in some of the stations, emergency medical technicians (ATT), ambulance and emergency care technicians (AABT) and drivers generally work in the stations. The 112 Emergency Call Center is quickly interrogated by the command and control center staff and the closest and most appropriate ambulance is radioed to the scene as soon as possible. The 112-team assigned for any emergency health event is both instantly monitored and guided by the command and control center via satellite tracking system and digital maps throughout the duty period. In this system, which provides service on a 24/7 basis, outputs such as the number of cases, rural-urban distribution of cases, call reasons and response results of the teams are provided and national and international comparisons can be made with these outputs [3,7,12-14]. This study was conducted to determine the distribution of pre-hospital emergency health services provided by 112 PHCs in Bingöl provincial center and districts in 2019, 2020 and 2021, according to the number of cases, location of cases, gender, reasons for call, months, preliminary diagnoses, and the way the cases were concluded, to compare the change over the years and to evaluate the impact of the pandemic on pre-hospital emergency health services.

METHOD

This study is a descriptive research conducted with retrospective data analysis. Within the scope of the study, the data of 112 ASHİ in Bingöl for the years 2019, 2020 and 2021 were analyzed through the Emergency Health Automation System (ASOS). Calls to the stations, call reasons, distribution by gender and months, preliminary diagnoses and finalization status of cases were evaluated.

Bingöl is a small province with a population of 282,566. Its population is around 170 thousand including the city center and the villages connected to it, and it has 7 districts. Approximately 45% of the population is rural. A total of 19 ASHİs, 8 ASHİs in the center of Bingöl and 11 ASHİs in the districts, provide service.

Emergency Health Automation System (ASOS) is a system developed by the Ministry of Health, General Directorate of Emergency Health Services in order to instantly monitor all data entries needed in the emergency health system. With ASOS, training, quality, case tracking, material and drug status, personnel movements, ambulance and fixture status, shift lists and quality evaluations of Provincial Ambulance Services are made and monitored. In short, all work and transactions related to 112 are carried out and monitored through this system.

Ethical Approval

For the study, research permission and permission to access the data were obtained from Bingöl Provincial Health Directorate with letters dated 25.04.2022 and numbered 822. Permission for the study was obtained from Istanbul Medipol University Non-Interventional Clinical Research Ethics Committee with the decision dated 10.08.2023 and numbered 674.

Statistical Analysis

The data were analyzed with SPSS 26 and comparisons were made by calculating the frequency and percentages of the data.

RESULTS

Evaluation of 2019 Data

In 2019, Bingöl 112 Provincial Ambulance Service Chief Physician's Office provided services at 19 stations with 39 ambulances. The Command and Control Center received 27,874 calls. August (10.3%), July (10%) and June (9.2%) were the months with the most calls, while November (6.8%) and February (7.1%) were the months with the least calls. The distribution of calls by gender was 51.9% male and 48.1% female. Emergency calls were mostly received by the 18-34 age group (25.2%), 35-49 age group (23.3%) and 65 and over age group (21.4%), respectively. 67.8% of emergency calls came from urban areas and 32.2% from rural areas. The highest proportion of emergency calls were for medical reasons (86.7%) and traffic accidents (3.8%). The majority of emergency calls (61.7%) resulted in hospital referrals, with inter-hospital transfers being the second most common type of referral. When the calls in 2019 were classified according to preliminary diagnoses, the groups with the highest preliminary diagnoses were "cardiovascular diseases" 12.84%, "trauma and injuries" 11.41%, "gastrointestinal system disorders" 10.68% and "urinary system disorders" 7.38% (Figure 1, Figure 2, Figure 3, Figure 4).

Evaluation of 2020 Data

In 2020, Bingöl 112 Provincial Ambulance Service Chief Physician's Office provided service with 38 ambulances at 19 stations. In 2020, 39,531 calls were received by the Command and Control Center. November (12.1%), August (11.7%) and September (11.3%) were the months with the most calls, while February (5.1%) and March (5.9%) were the months with the least calls. The distribution of calls by gender was 50.04% male and 49.96% female. The highest number of emergency calls were received by the 65 and over age group (27.1%), 35-49 age group (24.4%) and 18-34 age group (19.9%). 65.7% of emergency calls were received from urban areas and 34.3% from rural areas. The highest proportion of emergency calls were for medical reasons (91.7%) and traffic accidents (2.1%). The majority of emergency cases (64.7%) resulted in hospitalization, with inter-hospital transfer (14.7%) being the second most common type of outcome. When the calls in 2020 were classified according to preliminary diagnoses, the most common diagnoses were "Covid-19 and related diagnoses" 28.46%, "cardiovascular diseases" 10.14%, "trauma and injuries" 7.25% and "gastrointestinal system disorders" 6.92% (Figure 1, Figure 2, Figure 3, Figure 4).

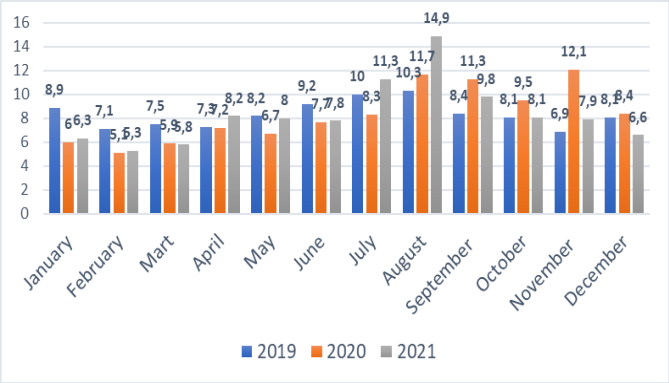

Figure 1. Comparison of cases by month (percentage distribution)

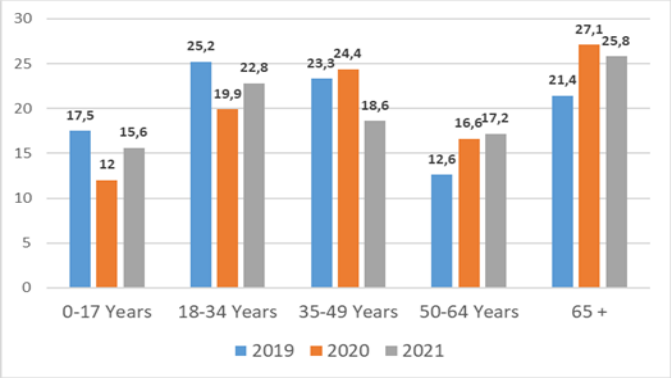

Figure 2. Comparison of cases by age groups (percentage distribution)

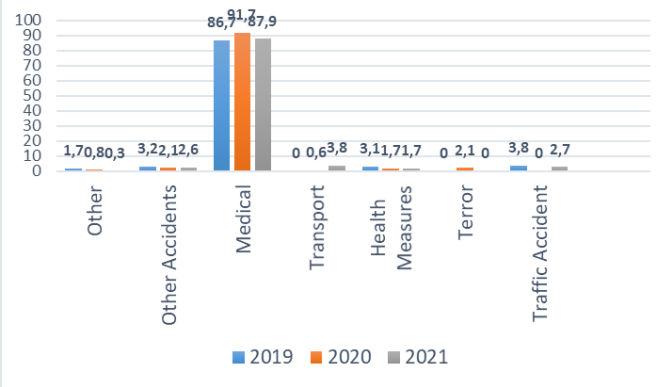

Figure 3. Comparison of cases by reasons for call (percentage distribution)

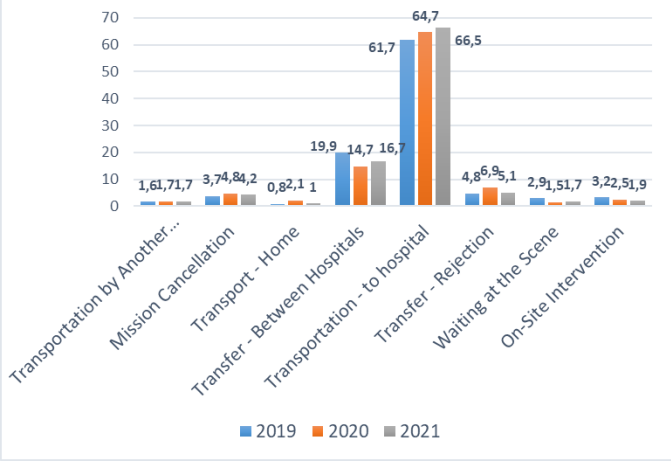

Figure 4. Comparison of cases by call outcome status (percentage distribution)

Evaluation of 2021 Data

In 2021, Bingöl 112 Provincial Ambulance Service Chief Physician's Office provided service with 40 ambulances at 19 stations. In 2021, the Command and Control Center received 36,801 calls. July (11.3%), August (14.9%) and September (9.8%) were the months with the most calls, while February (5.3%) and March (5.8%) were the months with the least calls. The distribution of calls by gender was 52% female and 48% male. The highest number of emergency calls were received by the 65 and over age group (25.8%), 18-34 age group (22.8%) and 35-49 age group (18.6%). 65% of emergency calls came from urban areas and 35% from rural areas. The highest proportion of emergency calls were medical (87.9%), transport (3.8%) and traffic accidents (2.7%). The majority of emergency cases (66.5%) resulted in referral to hospital, with inter-hospital transfers (16.7%) being the second most common type of referral. When the calls in 2021 were classified according to preliminary diagnoses, the most common diagnoses were "Covid-19 and related diagnoses" 21.51%, "cardiovascular diseases" 9.71%, "trauma and injuries" 8.59% and "gastrointestinal system disorders" 8.40% (Figure 1, Figure 2, Figure 3, Figure 4).

DISCUSSION

In 2019, the population per 112 station in Bingöl was 14,727 and the number of cases per 112 station was 1,467; in 2020, the population per 112 station was 14,830 and the number of cases per 112 station was 2,080; in 2021, the population per 112 station was 14,900 and the number of cases per 112 station was 1,936. In 2019, the population per 112 station in Turkey was 28,813 and the number of cases per 112 station was 1980, in 2020 the population per 112 station was 27,415 and the number of cases per 112 station was 2,428, in 2021 the population per 112 station was 26,713 and the number of cases per 112 station was 2269. The population per station in Bingöl is almost half of the Turkey average in 2019, 2020 and 2021. In addition, the number of cases per station in Bingöl is below the average for Turkey in the years of the research. The number of 112 stations has been increased by the Ministry of Health in regions with a high rural population in order for citizens living in rural areas to benefit from pre-hospital emergency health services effectively. This situation caused the population per station to be lower than the national average in regions with high rural populations. However, while the population per station in Bingöl is lower than the average of Turkey, the number of cases per population is higher than the average of Turkey. As expected during the pandemic period, the number of cases increased both in Bingöl and in Turkey [15-18] (Figure 5).

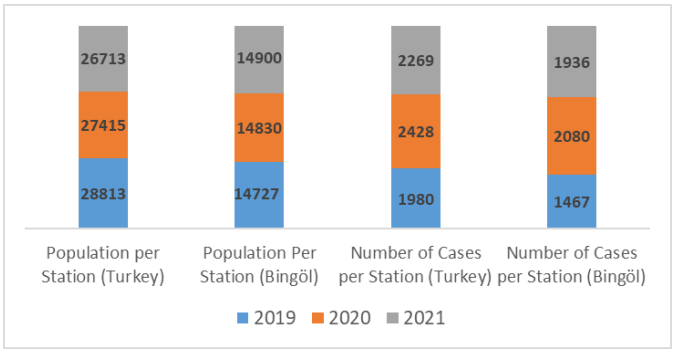

Figure 5: Comparison of population and number of cases per station in Turkey and Bingöl

The highest number of emergency calls occurred in the summer months in 2019, in November, August and September in 2020, and in July, August and September in 2021. While the need for emergency health services increases during periods of intense social mobility during the year, extraordinary situations such as pandemics have also significantly increased the demand for emergency health services [5,19]. As the population of the country increases over the years, the organizational structure of pre-hospital emergency health services

develops, new stations are opened and the use of emergency health services increases [13]. In a study by Barnett et al. it was shown that well-organized emergency health services equipped with qualified health manpower reduce morbidity and mortality and increase the chance of survival of the patient or injured [2].

According to age groups, the highest number of emergency calls were made in the 18-34 age group (25.2%), 35-49 age group (23.3%) and 65 and over age group (21.4%) in 2019, in the 65 and over age group (27.1%), 35-49 age group (24.4%) and 18-34 age group (19.9%) in 2020 and in the 65 and over age group (25.8%), 18-34 age group (22.8%) and 35-49 age group (18.6%) in 2021. In the pre-pandemic period, the number of emergency calls was higher in the young and middle-age groups due to the fact that the population of young and middle-age groups was higher than the population over 65 years of age, and the possibility of encountering situations such as traffic accidents and trauma was relatively high. However, during the pandemic period, the emergency health needs and use of emergency health services were higher in individuals over the age of 65 who have chronic diseases and need physical and social support [19,20]. In a study conducted in Izmir, the demand for emergency healthcare assistance by individuals over the age of 65 (26.9%) was significantly higher than other age groups, which is similar to our study [21]. A study conducted in Europe showed that the use of prehospital emergency health services increased as the population and age increased [22].

Of the number of emergency calls, 67.8% in 2019, 65.7% in 2020 and 65% in 2021 came from urban areas. The social and cultural structure of the society and the organizational and manpower elements of pre-hospital emergency health services have an impact on the effective and efficient delivery of emergency health services. In a study conducted in Trabzon in 2016, it was observed that station locations, characteristics of the city such as buildings, roads and infrastructure, and the health literacy and education level of the society affect the transportation and response processes to emergency cases [23]. In a study conducted in Pakistan, with the increase in the prevalence and accessibility of prehospital emergency health services, it has become easier for the sick or injured to reach the qualified emergency health care they need [24]. In a study conducted in Germany, it was stated that planning should be done taking into account regional differences for the differences between the use of emergency aid needs in urban and rural areas and for the effective and efficient provision of prehospital emergency health services [25].

The majority of emergency calls accepted by 112 were medical in 2019 (86.7%), 2020 (91%) and 2021 (87.9%). In a study conducted in Kayseri in 2017, the most common call reasons were medical (74.9%), other accidents (10.1%) and traffic accidents (9.8%), respectively [7]. According to our study, although medical calls are more frequent in Kayseri, accidents occur less frequently in our province. In other studies, conducted in Turkey, emergency call rates are higher in big cities due to traffic accidents and other accidents [8,26,27]. In another study conducted in Gaziantep, 56.4% of the call reasons were medical and 16.3% were due to traffic accidents [14].

The majority of emergency calls to 112 resulted in referral to hospital (61.7% in 2019, 64.7% in 2020 and 66.5% in 2021), and inter-hospital transfers were also significant (2019-19.9%, 2020-14.7%, 2021-16.7%). In a study conducted in Izmir, 84.8% of emergency calls resulted in hospital transfer, inter-hospital transfer and on-site intervention [20]. In a study conducted in Gaziantep, 62.5% of the cases were transported to the hospital and 13.52% were intervened on-site [14]. The absence of a university hospital and a training and research hospital in Bingöl has led to more referrals outside the province.

The most frequent emergency calls according to preliminary diagnoses, respectively; In 2019, cardiovascular diseases (12.84%), trauma and injuries (11.41%), gastrointestinal system disorders (10.68%) and urinary system disorders (7.38%), in 2020 Covid-19 and related diagnoses (28.46%), cardiovascular diseases (10.14%), trauma and injuries (7.25%) and gastrointestinal disorders (6.92%), while in 2021, Covid-19 and related diagnoses were (21.51%), cardiovascular diseases (9.71%), trauma and injuries (8.59%) and gastrointestinal disorders (8.40%). Covid 19-related illnesses increased markedly during the pandemic. However, Covid 19 and related pre-diagnoses were proportionally high during the pandemic period, as Covid 19 and related pre-diagnoses were selected as the primary pre-diagnosis of patients with Covid 19 disease or Covid 19 disease clinic, even if they had another chronic diagnosis. In a study conducted in Tekirdağ in 2003, trauma (32.9%) and cardiovascular diseases (19.4%) were seen most frequently and the results were different from our study [28]. In a study conducted in Gaziantep, while the rate of trauma pre-diagnosis was 29.8%, the rate of cardiovascular pre-diagnosis, which ranked second, was 16.4% [14]. The fact that the preliminary diagnosis of trauma ranked first in the studies conducted in Gaziantep and Tekirdağ may be related to the fact that these cities are big cities with high human and traffic density and as a result, more traumatic events may have occurred. A study conducted in the Netherlands showed that the organization and cost status of pre-hospital emergency health services in countries affect the demand for emergency assistance [29].

Limitations

Since our study deals with service provision in a limited period of time (3 years) in only one province, the findings obtained may not be sufficient for the general evaluation of emergency health services.

CONCLUSION

Global public health problems such as the Covid 19 pandemic lead to an increase in the number of cases in emergency health services and affect the transportation time to emergency cases. Factors such as the population per station, the number of adequate and qualified personnel and the transportation time to the emergency case are important in the effective and efficient provision of pre-hospital emergency health services. The number of sufficient and qualified personnel significantly reduces morbidity and mortality by providing effective intervention to emergency cases. The location of the station affects the transportation time to the case, traffic accidents, the frequency of emergency aid incidents and the amount of population per station. Considering factors such as regional geographical differences, human density and frequency of emergencies in the planning and delivery of emergency health services can contribute positively to service quality.

Ethical Approval: *2023/674 İstanbul Medipol University Non-Interventional Clinical Research Ethics Committee*

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