




Effect of Home Health Services on Emergency Department Admissions of Geriatric Patients: A District Example

Geriatrik Hastaların Acil Servis Başvurularında Evde Sağlık Hizmetlerinin Etkisi: Bir İlçe Örneği

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ÖZET

Amaç: Dünyada ve toplumumuzda ortalama yaşam süresinin uzaması, ölüm hızının azalması, tıp alanında yaşanan gelişmelere bağlı olarak yaşlı nüfus artmaktadır. Bu durum yaşlanan toplumla beraber, geriatrik hastaların kaliteli, uzun dönem bakım ihtiyacını ve yaşlı bakımda bütünsel etik yaklaşım gözetilerek, özerklik, adalet ve zarar vermeme gibi etik ilkelerin de etkin bir şekilde kullanılmasını beraberinde getirmektedir. Bu çalışmada Acil Servis'e başvuran geriatrik hastaların demografik ve genel özelliklerinin tespit edilmesi, Evde Sağlık Hizmetleri'nden faydalananlar ile bu hizmeti kullanmayanların Acil Servis başvurularının karşılaştırılması amaçlanmıştır. **Gereçler ve Yöntem:** Çalışma, retrospektif dosya taraması olarak yürütülmüştür. Bu çalışma ilçede tek bir Acil Servis olması ve Evde Sağlık Hizmetleri hastalarının başka bir acil servise başvuramayacağı da dikkate alınarak bir ilçe devlet hastanesi acil servisinde yapılmıştır. Acil Servis'e 1 yıl içinde başvuran 65 yaş ve üzeri tüm hastaların verilerine ulaşılmıştır.

Bulgular: Acil Servis'te bir yıl içinde yapılan 116.263 muayenenin %11,4 (n=13.261)'ünün geriatrik yaş grubundaki bireylere ait olduğu bulundu. Acil Servis'e başvuran hastalardan Evde Sağlık Hizmetleri'ne kayıtlı olanların yaş ortancası 77 (65-101) iken kayıtlı olmayanları 72 (65-107) idi. Acil Servis'e bir yıl içinde muayene için gelen geriatrik hastaların mükerrer başvuru sayıları ortancasının 3 (2-45) olduğu tespit edildi.

Sonuç: Sağlık sistemi ve Acil Servis açısından önemli bir gösterge olan mükerrer başvuru oranlarının Evde Sağlık Hizmetleri'ne kayıtlı geriatrik hastalarda daha yüksek olması başta olmak üzere bu çalışmada elde edilen birçok sonuç, Evde Sağlık Hizmetleri ile Acil Servis başvuruları arasında ilişki olduğunu göstermektedir. Bu durum Evde Sağlık Hizmetleri ve evde bakım uygulamalarının daha verimli hale getirilmesinin geriatrik hastaların Acil Servis başvurularında azalma etkisi oluşturabileceğini düşündürmektedir.

Anahtar Kelimeler: Evde bakım hizmetleri, sağlık hizmetleri, geriatrik, acil tıp, tıbbi etik

ABSTRACT

Objective: The elderly population is increasing worldwide and in Turkish society due to increased life expectancy, decreased mortality rate, and developments in medicine. This situation, together with the aging society, brings with it the need for quality long-term care of geriatric patients and the effective use of ethical principles such as autonomy, justice, and non-maleficence by considering a holistic ethical approach in elderly care. In this study, we aimed to determine the demographic and general characteristics of geriatric patients admitted to the emergency department (ED) and to compare the ED admissions of those who benefit from Home Health Services (HHS) with those who do not use this service.

Materials and Methods: The study was conducted as a retrospective file review in the ED of a district state hospital, taking into account that there is only one ED in the district, and HHS patients cannot apply to another emergency department. It was aimed to access the data of all patients aged 65 years and over who applied to the ED within 1 year.

Results: It was found that 11.4% (n=13,261) of 116,263 examinations performed in the ED within one year belonged to individuals in the geriatric age group. The median age of the patients admitted to the ED who were registered to HHS was 77 (65-101), while the median age of those who were not registered was 72 (65-107).

Conclusion: Many results obtained in this study, especially the fact that the rate of repeated admissions, which is an important indicator for the health system and the ED, is higher in geriatric patients enrolled in HHS, indicate that there is a relationship between HHS and ED admissions. This suggests that making HHS and home care practices more efficient may reduce geriatric patients' ED visits.

Keywords: Home care services, health services, geriatric, emergency department visits, ethics, medical

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INTRODUCTION

Today, the elderly population in societies is increasing due to the improved mean life expectancy, decreased death rate, and developments in medicine. Aging society brings the need for quality long-term care for geriatric patients. A holistic ethical approach should be observed in elderly care and ethical principles such as autonomy, justice, and non-maleficence should be used effectively to increase the quality of care and support for the elderly. There is no single definition of old age accepted by all disciplines and there are many different definitions from physiological, biological, economic, or sociological perspectives, but the chronological definition put forward by the World Health Organization (WHO) is commonly used (1-4). It is not completely accurate to define elderly individuals only with a chronological approach, however when viewed from this perspective, it was reported that the number of individuals aged 60 and over exceeded the number of children under the age of 5 in 2020. It is estimated that by 2050, the population of people aged 60 and over will double its current level, and the number of elderly people aged 80 and over will increase threefold (2). Similar to the changes in the world, it is reported that the elderly population in Türkiye has increased between 2007 and 2023 and the median age has increased from 33.5 to 34 in the last year, while the proportion of the elderly population in the total population has increased from 9.9% to 10.2% (5-7).

Per this information and projections, many new applications are being implemented worldwide to closely monitor geriatric patients and improve their quality of life. Geriatric hospitals, day hospitals, subacute care units, three-generation homes, elderly residences, elderly villages, retirement homes, technological assistant services, and elderly care robots can be listed as some models and services for these applications (8, 9). In Türkiye, the services for the elderly carried out by the Ministry of Family and Social Policies and the health services provided by preventive, curative, rehabilitation, and care carried out by the Ministry of Health are among these regulations (10, 11). Within the framework of the "Turkish Healthy Aging Action Plan and Implementation Program" prepared by the Ministry of Health regarding healthy aging and health protection in the elderly, "Development of Home Health Services (HHS) for the Elderly" has been accepted among the priority intervention plans, and "Ensuring the Organization of Acute Care and Emergencies in Geriatrics" is among other goals and strategies of the program. As mentioned in this program, many studies are being conducted and developments are being made regarding geriatric emergencies (12-15).

Plans made for geriatric patients show that all preventive, treatment and rehabilitative health services are complementary and inseparable parts of elderly care services. Considering that HHS aim to meet the health and social needs of people in their homes and that some of the patients who apply to the emergency department (ED) are elderly and in need of care, it is conceivable that there may be a relationship between the use of HHS and emergency service visits. This study aimed to determine the demographic and general characteristics of

geriatric patients who apply to ED and to compare the ED visits of those who use HHS and those who do not use this service.

MATERIALS AND METHODS

The study was conducted as a retrospective file review in a state hospital emergency services department, considering that there was only one ED in the district and that HHS patients could not apply to another ED. Ethics Committee (2023/4381) approval and administrative permission were obtained before the study. No sample calculation was made for the study, and the aim was to access the data of all patients aged 65 and over who applied to the ED between 01.01.2022 and 31.12.2022. Data were collected by scanning patient digital files through the Hospital Information Management System.

Patients registered to the HHS were primarily identified through the HHS system during data collection. HHS patients under the age of 65 in 2022 and patients who were not active in terms of service were excluded from the study, and patients aged 65 and over who applied to the ED for examination were screened. Among these patients, those who applied to the ED for dressing and injection were excluded from the study (Figure 1). Demographic characteristics of the patients included in the study, reasons for admission, how they came to the hospital, and recurrent hospital admissions were recorded.

The obtained data were transferred to the computer and analyzed. The statistical analysis of the findings was done by using Statistical Packages for the Social Sciences (SPSS) 18.0 Windows software package (SPSS Inc., Chicago, IL, US). Descriptive statistical methods (number, percentage, median (min-max), arithmetic mean \pm standard deviation) were used in the evaluation of the data. The Kolmogorov-Smirnov test was used to analyze whether the data were normally distributed. Chi-square (χ^2) test was used to compare categorical data, and Mann-Whitney U test was used to compare two groups with nominal data. The status of being registered with HHS and the decision to be hospitalized and treated in the ED were evaluated with Fisher Chi-Square. The level of statistical

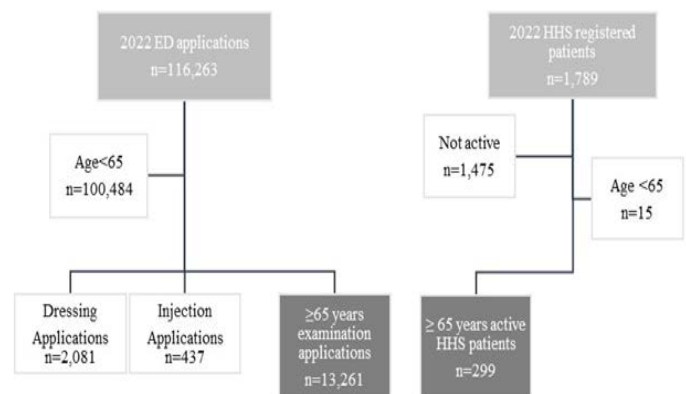


Figure 1. Inclusion and exclusion criteria of the study

significance was accepted as $p < 0.05$.

RESULTS

Of the 116,263 examinations performed in the ED in a year, 11.4% ($n=13,261$) were done on individuals in the geriatric age group. Other data on the number and characteristics of geriatric visits are presented in table 1.

A total of 1,366 HHS visits were performed in one year. There were 299 patients over the age of 65 registered with HHS and 98.6% ($n=1347$) of the visits were made to these patients. The median age of patients that were visited was 76 (65-101). Other demographic and general characteristics of the patients are shown in table 2. The median benefit from HHS in a year for

geriatric patients registered with HHS was 3 (2-43).

Diagnoses of 13,261 geriatric patients who visited the ED and 1,347 geriatric age group visits registered with HHS were listed according to the 3-digit diagnosis codes of the International Classification of Diseases (ICD). Accordingly, the first three most commonly used ICD 3-digit diagnosis codes are given in table 3.

The median number of repeated applications of geriatric patients who came to the ED for examination in a year was 3

Table 1. Evaluation of Geriatric Patient Applications to the Emergency Department ($n=13,261$)

Characteristics	n (%)
Gender	
Male	5.875 (44.3)
Female	7.386 (55.7)
Application type	
By ambulance	809 (6.1)
With own means	12.452 (93.9)
Application codes	
Green	1.883 (14.2)
Yellow	11.338 (85.5)
Red	27 (0.2)
Black	13 (0.1)
	Median (min- max)
Age	73 (65-107)

Table 2. Characteristics of patients enrolled in Home Health Services ($n=299$)

Characteristics	Patients Registered for Home Health Services n (%)
Gender	
Male	126 (42.1)
Female	173 (57.9)
Dependency Status	
Semi-Dependent	210 (70.2)
Fully Dependent	89 (29.8)
Time of Enrollment in Home Health Services	246 (82.3)
Previously Registered Patient	53 (17.7)
	Median (min-max)
Age	76 (65-101)

Table 3. Most frequent ICD 3-digit diagnosis codes in geriatric patients in emergency department visits and Home Health Service visits

Emergency Department Most common ICD codes	n (%)	Home Health Services Most common ICD codes	n (%)
M79-Other soft tissue disorders, not elsewhere classified	2081 (15.7)	M79- Other soft tissue disorders, not elsewhere classified	136 (36.4)
Z00-General examination and examination of individuals with no complaints or known diagnoses	1215 (9.2)	R54-Old Age	105 (16.7)
J06-Acute upper respiratory tract infections	640 (4.8)	N30- Cystitis	99 (16.0)

Table 4. Characteristics of HHS-registered patients ($n=201$) and non-HHS registered patients ($n=5277$) presenting to the emergency department

Characteristics	Patients Presenting to the Emergency Department		p
	Registered with HHS n (%)	Not registered with HHS n (%)	
Gender			
Male	80 (39.8)	2301 (43.6)	$p=0.284$
Female	121 (60.1)	2976 (56.4)	$\chi^2=1.147$
Application Method			
By ambulance	41 (20.4)	290 (5.5)	$p < 0.001$
With own means	160 (79.6)	4987 (94.5)	$\chi^2= 157.696$
Treatment Method			
Receiving inpatient treatment	36 (17.7)	95 (1.8)	$p < 0.001$
Receiving outpatient treatment	165 (82.2)	5182 (98.2)	$\chi^2=235.801$
	Median (min-max)	Median (min-max)	
Age	77 (65-101)	72 (65-107)	$p < 0.001$ $U=304.261$

(2-45). When evaluated on a patient basis 67.2% (201) of 299 patients registered with HHS applied to the ED, and the rate of repeated applications to ED among these was 73.1%. There were 5,277 patients over the age of 65 who applied to the ED and were not registered with HHS, and the rate of repeated applications among them was 52.6%. A statistically significant difference was found between the repeated application status of patients applying to the ED and being a home health patient ($p < 0.001$, $\chi^2 = 32.693$). Moreover, 90.5% of those who used HHS were examined with the yellow zone examination code, while the percentage of yellow-coded examinations in those not registered with HHS was 85.3%. No significant difference was found between whether the patients applying to the ED were examined with a green or yellow code and whether they were registered with the HHS ($p = 0.82$, $\chi^2 = 3.030$). Other data regarding whether the patients applying to the ED were registered with the HHS are given in table 4.

DISCUSSION

The age distribution of geriatric patients who applied to the ED and received HHS services in our study is consistent with the information in the literature that reports the mean age of 65-99 and the distribution of gender ratios of 51-60%, where the majority is female patients (16-19). Considering this situation, a high prevalence of female patients in ED applications and HHS registrations is expected (20-22). Therefore, it may be important to consider the age and gender factors in terms of the patient group to be served in ED and HHS during planning. In addition, the fact that the mean age of patients who applied to the ED and were registered in HHS was significantly higher suggests that with the arrangements to be made in terms of quality and efficiency in the presentation of HHS for those in the older age group, the ED applications of this patient group may be reduced.

According to the results obtained in the study, the vast majority of active HHS patients are geriatric patients. This is an expected result considering the physical and cognitive losses of geriatric patients and the hearing and vision problems they have. However, considering that life expectancy is shorter in geriatric patients, the fact that HHS patients in this study were more likely to be older patients and that the HHS patient profile consisted of geriatric patients compared to young patients suggests that the care and treatment processes were well managed and that the care of patients is not planned to be temporary and that the right patients are included in the HHS system. Although it is conceivable that a well-functioning HHS structure will have a significant impact on ED admissions, no comparison could be made due to the lack of sufficient studies in the literature (23, 24). Sharing data on ED admission rates of HHS patients in future HHS-focused studies will contribute to the literature.

The significant difference between HHS-registered and non-registered geriatric patients arriving at the ED by ambulance can be explained by the higher mean age and the limited mobility of HHS patients. Due to the limited availability of ambulance services, increased use of HHS transport vehicles

can be considered to prevent problems that may occur during transportation of these patients to the healthcare facilities. In addition, considering that most of the geriatric patients not registered at the HHS also require assisted transportation, the fact that the rate of ambulance applications in ED is lower than the 10-11% rate reported in the literature may indicate that a conscious behavior has developed regarding the use of ambulances (25-27). More studies are needed to understand this situation.

When the ED triage codes obtained in our study were examined, the ED yellow zone coding rates of geriatric patients were higher than the 53-75% rate reported in the literature (28, 29). The fact that more tests are requested for geriatric patients and their follow-up periods are longer may be considered as the reason for this. Physician preference or the fact that fewer patients are seen in district conditions may have allowed these patients to be followed up with more yellow zone codes. In HHS patients, this rate is high and reaches 90% in the literature (12). Although there is no significant difference between HHS-registered and non-registered geriatric patients in this regard, the results obtained are consistent with the literature (12,24,25). This situation can be considered as an indicator of the need for other regulatory requirements to be made in the ED organization, such as the establishment of specialized teams in EDs for geriatric patients, especially those registered with HHS, and the importance of a multidisciplinary approach, to prevent the disruption of the treatment processes of other patients in the yellow zone and to demonstrate an ethical approach.

In our study, the rate of geriatric patients applying to the ED was found to be above the TÜİK district center population rate of 65 and over (9.6%). This shows that the rate of the elderly population receiving service from the ED is higher than their share of the population and seems to be consistent with the information presented in the literature (5, 16). The fact that the elderly population receives service from the ED at a high rate will provide important information in terms of the directions in which the services provided by the HHS should be expanded. This situation makes patient diagnoses valuable. Although there are different data in the literature (24, 30), this study shows that geriatric patients mostly come with complaints of soft tissue disorders and then apply for general examination. This situation suggests that HHS services may need to be planned differently for different regions and that more efficient service by primary care and HHS will reduce ED applications. The studies that focus on the use of technological equipment and development of remote examination conditions will be important (31, 32).

The fact that the hospitalization rates of patients admitted to the ED vary greatly in the literature, ranging from 2% to 85% (16, 17, 19, 33, 34) may be related to the medical equipment status, physical structure, and personnel availability in the centers where the studies were conducted. The fact that the rate of inpatient follow-up of geriatric patients was lower in our study suggests that the difficulty of patient follow-up in district conditions and the high probability of referral to other

hospitals caused the hospitalization rate to decrease even further. However, according to the results obtained in our study, the fact that geriatric patients registered with the HHS receive inpatient treatment at a higher rate than non-registered patients supports the study by Benli et al. that the development of home care and health services and the planning to be made in this direction will benefit many situations such as reducing the rates of ED admissions and hospitalizations of geriatric patients and protecting them from hospital infections and resistant microorganisms (35).

Kim et al. reported that elderly patients had higher rates of repeated ED applications (36). Repeated or early applications are one of the most important problems in ED. In addition to being a quality indicator of the provided health services, the repeated applications of elderly patients are a situation that causes concern for ED doctors in terms of reviewing the accuracy of diagnosis and adequacy of treatment (37, 38). The findings obtained in our study were also consistent with the literature in this respect. The fact that HHS-registered geriatric patients in this study had a significantly higher rate of repeated ED applications supports the view that developments in HHS and the widespread use of technology in the field of HHS will reduce ED applications (15, 20, 31).

In conclusion, the fact that the mean age, hospitalization rates, and yellow zone follow-up rates of geriatric patients registered with HHS were higher than those of geriatric patients not registered with HHS indicates that the fragility of the former group was higher. Many results of this study, especially high recurrent ED visit rates, which are an important indicator for the health system and ED, in HHS-registered geriatric patients, show a relationship between HHS and ED applications. This suggests that making HHS and home care practices more efficient may decrease ED applications of geriatric patients. In addition, the ED application rates of geriatric patients are proportionally higher when compared to the rate of the same group in the population. Considering the disadvantaged situation of these patients in accessing health services in the crowded and chaotic environment of EDs, arrangements should be made for faster, more effective, and more efficient provision of ED services for geriatric patients, and international practices should be closely followed.

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REFERENCES

1. Kahveci MM, Yeniçeri N. Değişen dünyada yaşlılık. İzmir Katip Çelebi Üniversitesi Sağlık Bilimleri Fakültesi Dergisi. 2023; 8(2):593-9.
2. World Health Organization. Ageing and health [25.02.2024]. Available from: https://www.who.int/health-topics/ageing#tab=tab_1.
3. Tezcan S, Seçkine P. Türkiye'de demografik değişim; yaşlılık perspektifi. In: Aslan D, Ertem M, ed. Yaşlı sağlığı: Sorunlar ve çözümler. Ankara: Palme Yayıncılık; 2012: 2-8.
4. Dev PS, Eljo JGG. Ethical considerations for older adults. Nusantara Journal of Behavioral Social Sciences. 2024;3(1):1-8. <https://doi.org/10.47679/202444>
5. Türkiye İstatistik Kurumu. Adrese Dayalı Nüfus Kayıt Sistemi Sonuçları, 2023 [25.02.2023]. Available from: <https://data.tuik.gov.tr/Bulten/Index?p=Adrese-Dayali-Nufus-Kayit-Sistemi-Sonuclari-2023-49684>.
6. Kılıç P, Aydın L, Yılmaz B, et al. Investigation of the relationship between cognitive functions and perception of quality of life in individuals aged 65 years and older. Mev Med Sc. 2023;3(3):125-31. doi:<http://dx.doi.org/10.56752/>
7. Türkiye İstatistik Kurumu. İstatistiklerle Yaşlılık, 2022 [Available from: <https://data.tuik.gov.tr/Bulten/Index?p=Istatistiklerle-Yasliilar-2022-49667>].
8. Gürer A, Çırpan FK, Özlen NA. Yaşlı bakım hizmetleri. Sağlık Hizmetleri ve Eğitimi Dergisi. 2019;3(1):1-6. doi: 10.35333/JOHSE.2019.44
9. Kurtoğlu S, Koç A. Dünyada yaşlılara sunulan hizmet örnekleri. Başkent Üniversitesi Sağlık Bilimleri Fakültesi Dergisi. 2019;4(2):122-31.
10. Karakuş B. Türkiye'de yaşlılara yönelik hizmetler, kurumsal yaşlı bakımı ve kurumsal yaşlı bakımında illerin durumu. Ankara: Ertem Basım Yayın Dağıtım, 2018: 88-180.
11. Karan MA, Satman İ. Giriş ve amaçlar In: Türkiye Sağlık Enstitüleri Başkanlığı Türkiye Yaşlı Sağlığı Raporu: Güncel Durum, Sorunlar ve Kısa-Orta Vadeli Çözümler. İstanbul: Miki Matbaacılık, 2021:3-5.
12. Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü. Türkiye sağlıklı yaşlanma eylem planı ve uygulama programı 2021-2026 [25.02.2024]. Available from: https://hsqm.saglik.gov.tr/depo/birimler/kronik-hastaliklar-ve-yasli-sagligi-db/Dokumanlar/Kitaplar/Turkiye_Saglikli_Yaslanma_Eylem_Plani_ve_Uygulama_Programi_2021-2026.pdf.
13. Yılmaz A, Çavuş UY, Yılmaz N, et al. Geriatrik hastaların acil servisten beklentisi nedir? Geriatrik acil servislere ihtiyacımız var mı? Social Science Studies Journal. 2023;9(114):7724-30. doi : 10.29228/sss.70982
14. Hogan TM, Gerson L, Sanders AB. The history of geriatric emergency medicine. Journal of Geriatric Emergency Medicine. 2023; 4(1):1-21. doi: <https://doi.org/10.17294/2694-4715.1044>
15. McQuown CM, Snell KT, Abbate LM, et al. Telehealth for geriatric post-emergency department visits to promote age-friendly care. Health Serv Res. 2023;58:16-25. doi: 10.1111/1475-6773.14058.
16. Fatih O, Porsuk SK, Sedanur O, et al. Evde sağlık hizmeti alan hastaların acil servise başvuru nedenlerinin incelenmesi. TOGÜ Sağlık Bilimleri Dergisi. 2023;3(2):173-83. <https://doi.org/10.52369/togusagbilderg.1261012>
17. Ertan M. Use of emergency departments by elderly patients. Turkish Journal of Geriatrics. 2006;9(2):70-74.
18. Şimşek Öner D. Triaj sistemlerine genel bakış ve Türkiye'de acil servis başvurularını etkileyen faktörlerin lojistik regresyon ile belirlenmesi. Sosyal Güvence. 2018; 13: 84-115. <https://doi.org/10.21441/sguz.2018.66>
19. Öktem B, Üzer F. Acil servise başvuran geriatrik hasta popülasyonunun genel özellikleri. Kocatepe Tıp Dergisi. 2022;23(3):283-7. <https://>

- doi.org/10.18229/kocatepetip.933017
20. Jones A, Schumacher C, Bronskill SE, et al. The association between home care visits and same-day emergency department use: A case-crossover study. *CMAJ*. 2018; 30;190(17): E525-E531. doi: 10.1503/cmaj.170892
 21. Bayın G. Doğuştan ve ileri yaşta beklenen yaşam sürelerine etki eden faktörlerin belirlenmesi. *Türkiye Aile Hekimliği Dergisi*. 2016;20(3):93-103. doi: 10.15511/tahd.16.21693
 22. Caruso C, Marcon G, Accardi G, et al. Role of sex and age in fatal outcomes of COVID-19: Women and older centenarians are more resilient. *Int J Mol Sci*. 2023; 24(3):1-12. doi: 10.3390/ijms24032638.
 23. Ekingen E, Yıldız A. Evde sağlık hizmeti alan hastaların profillerinin incelenmesi: Batman ili örneği. *Türkiye Klinikleri Sağlık Bilimleri Dergisi*. 2021;6(3):609-17. doi: 10.5336/healthsci.2020-77586
 24. Çelik P, Çelik Ş, Hastaoğlu F. Acil servise başvuran geriatrik hasta profilinin belirlenmesi. *Geriatrik Bilimler Dergisi*. 2022;5(3):72-80. DOI: 10.47141/geriatrik.1202842
 25. Aydın T, Aydın ŞA, Köksal Ö, et al. Uludağ Üniversitesi Tıp Fakültesi hastanesi acil servisine başvuran hastaların özelliklerinin ve acil servis çalışmalarının değerlendirilmesi. *Akademik Acil Tıp Dergisi*. 2010;9(4):163-8. doi:10.5152/jaem.2010.006
 26. Aslan EÇ. Acil servis kullanımının değerlendirilmesi: Kesitsel bir çalışma. *Mersin Üniversitesi Sağlık Bilimleri Dergisi*. 2023;16(1):1-13. doi: 10.26559/mersinsbd.1068956
 27. Kaldırım Ü, Tuncer SK, Ardiç Ş, et al. Acil servise ambulans ile müracaat eden geriatrik olguların analizi. *Turkish Journal of Emergency Medicine*. 2013;13(4): 161-165. doi: 10.5505/1304.7361.2013.35651.
 28. Çevik C, Tekir Ö. Acil servis başvurularının tanı kodları, triyaj ve sosyo-demografik açıdan değerlendirilmesi. *Balıkesir Sağlık Bilimleri Dergisi*. 2014;3(2):102-7. doi: 10.5505/bsbd.2014.26349.
 29. Türkdoğan KA, Kapıcı M, Akpınar O, et al. Bir devlet hastanesi acil servisi demografik özellikleri: 2011 yılı meta analizi. *Journal of Clinical Experimental Investigations*. 2013; 4(3):274-8. doi: 10.5799/ahinjs.01.2013.03.0283.
 30. Bedel C, Tomruk Ö. Bir üniversite acil servisine başvuran geriatrik hastaların özellikleri. *SDÜ Tıp Fakültesi Dergisi*. 2018; 25(4):393-9. doi:10.17343/sdutfd.370472
 31. Merih YD, Ertürk N, Yemenci M, et al. Evde sağlık hizmetlerinde teknoloji kullanımı. *Türkiye Sağlık Enstitüleri Başkanlığı Dergisi*. 2021; 4(3):76-89. doi:10.54537/tusebdergisi.1037224
 32. Fidancı İ. Geriatrik yaş grubunun aile hekimliği polikliniğine başvuru sayıları ve nedenlerinin değerlendirilmesi: Retrospektif 5 yıl. *The Journal of Turkish Family Physician*. 2020;11(2):49-55. doi: 10.15511/tjtftp.20.00249
 33. Sert ET, Mutlu H, Kokulu K, et al. Acil servisimize başvuran hastaların 5 yıllık analizi. *Muğla Sıtkı Koçman Üniversitesi Tıp Dergisi*. 2021;8(1):1-4. doi:10.47572/muskutd.794039
 34. Kekeç Z, Koç F, Büyük S. Acil serviste yaşlı hasta yatışlarının gözden geçirilmesi. *Akademik Acil Tıp Dergisi*. 2009;8(3):21-4. doi: 10.4170/JAEM.2009.58070
 35. Benli AR, Sunay D. A model of collaboration between palliative care unit and home health care services: Karabük. *Ankara Medical Journal*. 2017;17(3):143-150. doi: 10.17098/amj.339333
 36. Kim K, Lee CA, Park SH, et al. Age-related differences in revisits to the emergency departments of eight Korean university hospitals. *Arch Gerontol Geriatr*. 2021 ;97:104489. doi: 10.1016/j.archger.2021.104489
 37. Aslaner MA. Acil servise geriatrik hastaların 72 saat içerisindeki tekrar başvuruları. *Acta Medica Alanya*. 2019;3(3):267-71. doi:10.30565/medalanya.562963
 38. De Gelder J, Lucke JA, de Groot B, et al. Predictors and outcomes of revisits in older adults discharged from the emergency department. *J Am Geriatr Soc*. 2018; 66(4):735-741. doi: 10.1111/jgs.15301