International
SOCIAL SCIENCES STUDIES Journal
Open Access Refereed E-Journal & Indexed & Publishing
e-ISSN: 2587-1587

RESEARCH ARTICLE
Health Sciences

What Does The Geriatric Patient Expect From Emergency Services? Do We Need A Geriatric Emergency Department?

Geriatrik Hastaların Acil Servisten Beklentisi Nedir? Geriatrik Acil Servislere İhtiyacımız Var Mı?

ABSTRACT

Geriatric patients appeal to emergency services (ES) much more frequently than expected from their representation in the population.This is natural and due to the more frequent incidence of many chronic illnesses with ageing but the number of geriatric patients presenting to ES is rising together with the rise in the proportion of elderly in the population. The quality of the triage in ES is becoming more of an issue. To reduce crowding in ES, it is necessary to take precautions, hospitalisation should be blocked and priorities should be made and speeded up. Abuse of emergency aid ambulances and their bringing in patients without consultation with the command centre should be hindered, especially geriatric patients should be distributed equally between the hospitals and unjust treatment of the patients should be avoided. It is recommended that geriatric units be established in hospitals and that geriatric ES be evaluated separately. Geriatric patients use mostly emergency aid and the expectancy of their being hospitalised is therefore high; practices should be set up to provide proper care for patients and make home treatment better.

Keywords: Geriatric Patient, Emergency Department, Expectations

ÖZET

Yaşlı hastalar, nüfustaki temsil düzeylerinden beklenenden daha sık acil servis (AS) hizmetlerine başvurmaktadır. Bu durum, yaşlanmayla birlikte birçok kronik hastalığın daha sık görülmesine bağlıdır, ancak yaşlı hastaların AS'e başvurma sayısı, yaşlı nüfusun oranındaki artışla birlikte artmaktadır. AS'deki triajın kalitesi giderek daha fazla sorun haline gelmektedir. AS'teki kalabalığı azaltmak için önlemler almak, hastaneye yatışın engellenmesi ve önceliklerin belirlenip hızlandırılması gerekmektedir. Acil yardım ambulanslarının kötüye kullanımı ve komuta merkezi ile danışmadan hastaların getirilmesi engellenmelidir, özellikle yaşlı hastalar hastaneler arasında eşit olarak dağıtılmalı ve hastalara haksız muamele yapılmamalıdır. Hastanelerde geriatri birimlerinin kurulması ve geriatrik AS'nin ayrı olarak değerlendirilmesi önerilmektedir. Yaşlı hastalar genellikle acil yardımı kullanmakta ve hastaneye yatma beklentileri yüksek olmaktadır; hastalara uygun bakım sağlamak ve evde tedaviyi iyileştirmek için uygulamalar geliştirilmelidir.

Anahtar Kelimeler: Geriatrik hasta, Acil Servis, Beklenti

Abdurrahman Yılmaz [1]
Umut Yücel Çavuş [2]
Nihal Yılmaz [3]
Fatih Büyükçam [4]
Sinan Yıldırım [5]

How to Cite This Article
Yılmaz, A., Çavuş, U. Y., Yılmaz, N., Büyükçam, F. & Yıldırım, S. (2023). " What Does The Geriatric Patient Expect From Emergency Services? Do We Need A Geriatric Emergency Department?" International Social Sciences Studies Journal, (e-ISSN:2587-1587) Vol:9, Issue:114; pp:7724-7730. DOI: http://dx.doi.org/10.29228/sssj.70982

Arrival: 09 May 2023
Published: 31 August 2023

INTRODUCTION

Geriatric patients appeal to emergency services (ES) much more frequently than expected from their representation in the population ((Aminzadeh F et al.,2002, Singal BM et al.,1992)). In some surveys, 9–19% of geriatric patients have been recorded as having appealed to ES (Strange GR et al.,1992,1998, Durukan P et al.,2005). This is natural and due to the more frequent incidence of many chronic illnesses with ageing. Furthermore, the self-care of these patients can also be problematic (Baum SA et al.,1987). The appeals geriatric patients make to ES and their admission to hospital services are increasing (Strange GR et al.,1992,1998, Ünsal A et al.,2003).

It has been shown that the geriatric age group attends hospitals 5–6 times more frequently than the younger population and is admitted to intensive care units 5.5 times more (Strange GR et al.,1992). The ratio with which they are referred to ES is 64.8% in patients aged ≥75 years; this ratio is two times more than that in young patients. Of these referrals, 43% arrive by ambulance and this ratio is 4.75 times more than that for young people (Strange GR et al.,1998). Geriatric patients are responsible for 6.4 million out of 110 million ES admissions in the USA every year. This number has increased by 34% in the ten-year period from 1993 to 2003. Old patients make up 15% of the admissions to the ES (Singal BM et al.,1992). About 50% of the elderly applying patients are admitted to

[1] Assist. Prof. Dr., Uşak University Faculty of Medicine Department of Emergency Medicine, Uşak, Türkiye. ORCID: 0000-0001-8024-8951
[2] Assoc. Prof. Dr., Ankara Diskapi Yildirim Beyazit EAH Emergency Medicine Clinic, Ankara, Türkiye. ORCID: 0000-0001-7100-1164
[3] Assist. Prof. Dr., Uşak University Faculty of Medicine Department of Physical Medicine and Rehabilitation, Uşak, Türkiye. ORCID: 0000-0002-7308-0510
[4] Assoc. Prof. Dr., Acıbadem Ataşehir Hospital Emergency Medicine Clinic, İstanbul, Türkiye. ORCID: 0000-0003-2453-160X
[5] Spec. Dr. Canakkale Mehmet Akif Ersoy State Hospital, Çanakkale, Türkiye. ORCID: 0000-0001-8191-168X

services for treatment and follow-up care. Geriatric patients constitute 43% of admissions from ES and 47% of all admissions to intensive care services (Birnbaumer DM, 2002).

A study done in Mersin determined that the most frequent reason for appealing to ES is cardiovascular system (CVS) problems and this is followed by gastrointestinal system (GIS), respiratory system, musculoskeletal system (MSS) and neurovascular system (NVS) problems (Mert E,2006). One study established that 64.3% of the old population has hypertension (HT) and congestive heart failure (CHF), 13.1% has diabetes mellitus (DM) and 15.5% has osteoporosis (OP) (Arslan Gürol G,2005). In a study done in Eskişehir, the five illness groups for which patients refer to ES most frequently were HT, cardiac diseases, pulmonary diseases, upper respiratory tract infections and urinary tract infections; this distribution pattern changes seasonally, so all these conditions ought to be considered while assigning ES facilities (Ünsal A et al.,2003).

Because of the difficulties in taking care of geriatric patients, their treatment of this patient age group is fairly hard on both doctors and other healthcare personnel. Constituting an important part of the patient population of Dışkapı Yıldırım Beyazıt Eğitim Araştırma Hastanesi (DYBEAH), patients over 65 years old are considerably overrepresented among those referring to the emergency medicine clinic (ATK) of our hospital. Furthermore, the proportion of geriatric patients brought to the ATK by ES as the first admission point and those directed from epicentres to our hospital is also high. For this reason, it has been considered that establishing a profile of the elderly patients applying to DYBEAH ATK in terms of the underlying diseases, distribution of diagnoses, admission from other services, expectations upon admission, reasons for presenting, frequency with which they present and duration of follow-up in ES could make clear where we stand with the provided services and what kinds of improvements should be made, if possible. Therefore, we assessed, using a questionnaire, the reasons for which patients aged ≥65 years applied to ES in DYBEAH ATK, and their complaints and expectations.

MATERIAL AND METHODS

Questionnaires were filled in after one to one conversations with patients aged 65 years and older coming to Dışkapı Yıldırım Beyazıt Eğitim Araştırma Hastanesi Emergency Medicine Clinic between 1 May and 21 July 2012 who accepted to take part in the study. Patients' complaints upon admission, health coverage, vital signs, backgrounds, reasons for applying to ES, complaints about ES, how they reached ES, course of treatment and whether they had attended ES and hospital previously were recorded. Early diagnoses have been grouped as follows: (1) Cardiovascular system diseases; (2) gastrointestinal system diseases; (3) orthopaedic diseases; (4) chest and pulmonary diseases; (5) urinary system diseases; (6) neurological diseases; (7) infectious diseases; (8) trauma; (9) haematological diseases. Patients' diagnostic results were obtained from the data processing unit. Diagnostic of patients referred from other institutions results were available.

In the statistical analyses, the mean, median and standard deviation were calculated and for the group comparisons, the chi-square test was used. $P < 0.05$ was taken to be statistically significant.

The study was approved by the Dışkapı Yıldırım Beyazıt Training and Research Hospital Medical Research Ethics Committee (approval number 02/12, dated 21 May 2012), and patients gave their informed consent to take part in the study.

RESULTS

The average age of the patients was 75.25 ± 6.83 (65–98) years old. This and the other results from the questionnaire are presented in Tables 1–6.

Table 1: Socio-demographic characteristics of patients at time of admission to ES.

Socio-demographic characteristics	Number	Frequency (%)
Age (Year)		
65–74	191	49.6
75–84	163	39.7
85 year old and over	41	10.6
Gender		
Female	200	51.9
Male	185	48.1
Social security class		
SSK	193	50.1
Government retirement fund	61	15.8
Insurance self-employed institution	66	17.1
Elderliness	65	16.9
Time of admission		
Between 08:00 and 16:00	221	57.4
Between 16:00 and 24:00	122	31.7
Between 00:00 and 08:00	42	10.9
Total	385	100.0

Table 2: Distribution of systems causing complaints and distribution of comorbid diseases at time of patients' presenting to ES.

Diagnosis upon admission	Number	Frequency (%)
Cardiovascular system	121	31.4
Gastrointestinal complaints	58	15.1
Chest diseases	49	12.7
Trauma	43	11.2
Neurologic complaints	35	9.1
Orthopaedic issues	26	6.8
Urinary system	24	6.2
Infections	17	4.4
Haematological complaints	12	3.1

Comorbid diseases		
Hypertension	226	58.7
Coronary artery disease	102	26.5
Diabetes mellitus	77	20.0
Congestive heart failure	71	18.4
Chronic kidney failure	61	15.8
COPD	50	13.0
Hyperlipidaemia	42	10.6
Cerebrovascular accident	32	8.3
Total	385	100.0

Table 3: Distribution of patients' reasons for appealing to and for being dissatisfied with ES.

Reasons for presenting (n = 385)	Number	Frequency (%)*
Expectance to be hospitalised	181	47.0
Receiving review results fast	161	41.8
Short waiting time	80	20.8
Having drip-feed	44	11.4
Referral by doctor	37	9.6
Be not able to come in day time	20	5.2
Referral by other healthcare personnel	15	3.9

Reasons for being dissatisfied (n = 385)	Number	Frequency (%) *
Crowds	236	61.3
Long hospitalisation duration	71	18.4
Long waiting time	60	15.6
Insufficient cleaning	8	2.1
Disinterest of doctor	4	1.0
Disinterest of other healthcare personnel	3	0.8

*Line percentage.

Table 4. Distribution of patients' diagnosis upon presenting to ES and mode of arrival at ES (Ankara. 2012) Diagnosis upon presentation *n* Mode of arrival at Es (%) *p*

		Ambulance*	Independent*	
Cardiovascular system	121	43.8	56.2	
Gastrointestinal	58	39.7	60.3	
Chest diseases	49	61.2	38.8	
Trauma	43	34.9	64.1	
Neurologic	35	62.9	37.1	0.002
Orthopaedic	26	23.1	76.9	
Urinary system	24	25.0	75.0	
Infection	17	64.7	35.3	
Haematologic	12	41.7	58.3	
Reason for coming to ES				
Short waiting time	80	40.0	60.0	0.372
Receiving reviews fast	161	34.8	65.2	0.001
Drip-feed issues	44	29.5	70.5	0.035
Expectance to be hospitalised	181	55.8	44.2	<0.001
Referral by doctor	37	43.2	56.8	0.880
Referral by other healthcare personnel	15	40.0	60.0	0.726
Not being able to come in during daytime	20	35.0	65.0	0.384

Table 5: Outcome of patients' referral to ES.

Outcome	Number	Frequency (%)
Ambulatory treatment	233	60.5
Observation	91	23.6
Hospitalised	48	12.5
Intensive care	7	1.8
Dispatch	3	0.8
Death	3	0.8
Total	385	100

Table 6. Distribution of result according to diagnosed diseases.

Diagnosed disease		*n*	Ambulatory treatment (%)	Under observation	Hospitalised treatment (%)	*p*
Hypertension	present	222	59.9	25.2	14.9	0.745
	absent	157	63.7	22.3	14.0	
Coronary artery disease	present	99	61.6	11.1	27.3	<0.001
	absent	280	61.4	28.6	10.0	
Diabetes mellitus	present	76	72.4	10.5	17.1	0.009
	absent	303	58.7	27.4	13.9	
Congestive heart failure	present	69	68.1	13.0	18.8	0.052
	absent	310	60.0	26.5	13.5	
Chronic kidney failure	present	59	54.2	39.0	6.8	0.007
	absent	320	62.8	21.3	15.9	
COPD	present	48	79.2	16.7	4.1	0.018
	absent	331	58.9	25.1	16.0	
Hyperlipidaemia	present	40	42.5	22.5	35.0	<0.001
	absent	339	63.7	24.2	12.1	
Cerebrovascular Disease	present	32	50.0	28.1	21.9	0.039
	absent		62.5	26.3	13.8	

*the chi-square test was used. $P < 0.05$ was taken to be statistically significant.

DISCUSSION

The number of geriatric patients presenting to ES is rising together with the rise in the proportion of elderly in the population. In the study done by Kekeş and colleagues in Çukuova, 49.5% of the participants were male (Kekeş Z et al.,2009). In our study, however, 51.9% of the patients were females and 48.1% were males. In a study by McCaig and colleagues, when geriatric patients' ages were examined, it was determined that 39% of the old patients appealing to ES were between 65 and 74 years old and 61% were ≥75 years old (McCaig LF et al.,2006). In our study, patients aged between 65 and 74 years constituted 49.6% of all patients, 39.7% were 75–84 years old and 10.6% were aged ≥85 years. The proportion of patients in the youngest group (65–74 years old) was in line with the literature (Wofford JL et al.,1996, Kıdak L et al.,2009). The percentage of patients arriving by ambulance when presenting to hospital was 44.4%, which was higher than the average in our country. In a study by Şahin and colleagues, the percentage of geriatric patients using an ambulance was found to be 7.5% (Şahin S et al.,2011). In our study, the reason for the high usage of ambulances might be that people living in the region where our hospital is located have financial difficulties and the ambulance system is safe and fast. As for the most frequent hours of

presentation, most patients arrived between 08:00 and 16:00 (57.4%) and we found that female patients applied more frequently during these hours (64%).

Hospitalisation ratios vary between 11.5% and 61% in the literature ((Ross MA et al.,2003, Ettinger WH et al.,1987, Lim KH et al.,1999). In a study done by Ünsal et al.,2003 78.3% of the old patients accepted by ES received ambulatory treatment and 21.2% had been monitored. In our study, 60.5% of patients (n = 233) were treated ambulatory, 12.5% (n = 48) were hospitalised, 23.6% (n = 48) were monitored, 0.8% (n = 3) died and 0.8% (n = 3) were dispatched to other medical centres. We attributed the low hospitalisation rates found here to be limitations of the questionnaire method. A different study has revealed that old patients consulting the geriatric department of ES increases their risk of being admitted to hospital. The rate found in that work was 63.5% (Sinoff G et al.,1998). Not having a geriatric department in our hospital can be a reason that in our study the rate of hospitalisation is low. The widespread hospitalisation rates might be related to countries having different proportions of the elderly in their population and whether or not the hospitals in which studies were done are subsidiary or reference hospitals in an underdeveloped region. We suspect that, in our study, the results were affected by the fact that some patients refused to take part and fill in the questionnaire.

The diseases frequently encountered in the literature differ among countries and regions. Satar S. et al.,2004 recorded stroke, but Kekeş Z et al.,2009 recorded metabolic/systematic diseases, cardiovascular diseases and cerebrovascular diseases as the most frequent diagnosis. In our study, the most frequent diseases have been determined to be cardiovascular (31.4%), followed by gastrointestinal system diseases (15.1%) and the third most frequent category of diseases is those related to chest ailments (12.7%). Ünsal A et al.,2003 stated hypertension, cardiac and pulmonary diseases, Hu and his colleagues stated cerebrovascular diseases, Mert E,2006 stated cardiac diseases, gastroenterological and respiratory system diseases as the most frequent diseases. However, in our study, the most frequent disease is hypertension and followed by coronary artery disease, DM and COPD, in line with the literature. The most frequent complaints for applying to ES are chest pain and dyspnoea. In line with our study, Ross and colleagues have found chest pain as the most frequent complaint for applying to ES in their ranking according to symptoms (Ross MA et al.,2003). The reason for differences in the diseases most frequently seen in elderly patients presenting to ES could be sociocultural structure differences in the regions served by hospitals, intensive studies in hospitals in a specific area, whether the hospital is in a city centre or not and differences in education in various societies.

In their study, Singal BM et al.,1992 determined that fewer geriatric patients apply to ES for reasons that are not urgent. In our study, 47% of geriatric patients referring to ES expected to be hospitalised. In all, 41.8 of them said to prefer ES because examinations and review results could be obtained faster there. Among those arriving by ambulance, a significantly high proportion (55.8%) expects to be hospitalised ($p < 0.001$). We reckon that the most important factor for geriatric patients wanting to be treated and examined in ES is that they have priority in ES, so they obtain their laboratory results faster; moreover, the quality of service in ES is increasing.

The most frequent complaint for patients is crowds (61.3%). Crowds have been a problem of ES from the outset. To reduce the occurrence of crowds, ES' structure and triage system should be organised conveniently. Patients who think hospitalisation duration is long number 18.4%. We reckon that increasing the number of beds notably and establishing geriatric units at hospitals could positively change the duration of hospitalisation. Waiting is found to be long by 15.6% of the patients. In a study done by LaMantia MA et al.,2010 to estimate hospitalisation of patients aged 75 years and older and the risks of their coming back to ES, age, triage score, heart pulse amplitude, diastolic blood pressure and their complaints at presentation have been found to be significant predictors. Their reapplication to ES was not evaluated and it was noted that each patient should be assessed individually (LaMantia MA et al.,2010). In our study, patients having coronary artery failure, COPD, or hyperlipidaemia was shown to be significant for determining their hospitalisation. Nevertheless, patients having hypertension and COPD were found to be significant for repetitive presentation. Because about half of all patients have hypertension, we take it that this may have affected the results. However, in our opinion, more detailed study should be done on this subject.

In a study by Mert in 2006, 5% of geriatric emergency applications constituted traumas. In our study, the frequency with which patients referred to ES because of geriatric trauma was 11.2%. The reason for this high ratio might be that our hospital is known as a trauma hospital.

The reasons patients are treated in ES are the inability of a hospital to diagnose the patient within 24 hours, the need for observation because of multiple traumas, the patient being discharged from hospital with a treatment of short duration and full occupancy of beds in our and other hospitals. In our study, the frequency of treatment under observation was 23.6%.

CONCLUSION

The quality of the triage in ES is becoming more of an issue. To reduce crowding in ES, it is necessary to take precautions, hospitalisation should be blocked and priorities should be made and speeded up. Abuse of emergency aid ambulances and their bringing in patients without consultation with the command centre should be hindered, especially old patients should be distributed equally between the hospitals and unjust treatment of the patients should be avoided. It is recommended that geriatric units be established in hospitals and that geriatric ES be evaluated separately. Geriatric patients use mostly emergency aid and the expectancy of their being hospitalised is therefore high; practices should be set up to provide proper care for patients and make home treatment better.

REFERENCES

Aminzadeh F, Dalziel WB. Older adults in the emergency department: a systematic review of patterns of use, adverse outcomes, and effectiveness of interventions. Ann Emerg Med 2002;39(3):238-47. (PMID:11867975).

Arslan Gürol G, Eşer İ. Yaşlılara verilen eğtimin ilaç kullanım uyumuna etkisinin incelenmesi. Türk Geriatri Dergisi 2005;8(3):134-40.

Baum SA, Rubenstein LZ. Old people in the emergency room: age-related differences in emergency department use and care. J Am Geriatr Soc 1987;35(5):398-404. (PMID:3571788).

Birnbaumer DM. The Elder Patient, In: Marx J, Hockberger R, Walls R (Eds), Rosen's Emergency Medicine—Concepts and Clinical Practice, Vol. 3. Mosby Inc., St. Louis, MO, USA 2002, pp 2485-91. http://www.drhem.com/education/wp-content/uploads/…/182-THE-ELDER-PATIENT.pdf.

Durukan P, Çevik Y, Yıldız M. Acil servise karın ağrısıyla başvuran yaşlı hastaların değerlendirilmesi Türk Geriatri Dergisi. 2005;8(3):111-4.

Ettinger WH, Casani JA, Coon PJ, Muller DC, Piazza-Appel K. Patterns of use of the emergency department by elderly patients. J Gerontol 1987; 42:638-642. (PMID:3680884).

Hu SC, Yen D, Yu YC, Kao WF, Wang LM. Elderly use of the ED in Asian metropolis. Am J Emerg Med 1999;17(1): 95-9. (PMID:9928713).

Kıdak L, Keskinoğlu P, Sofuoğlu T, Ölmezoğlu Z. İzmir ilinde 112 acil ambulans hizmetlerinin kullanımının değerlendirilmesi (The evaluation of 112 emergency ambulance uses in Izmir). Genel Tıp Derg 2009;19(3): 113-9.

Kekeş Z, Koç F, Büyük S. Acil serviste yaşlı hasta yatışlarının gözden geçirilmesi (Review of geriatric patients hospitalization in emergency department). Akademik Acil Tıp Dergisi 2009; 8:21-4.

LaMantia MA, Platts-Mills TF, Biese K, et al., Predicting hospital admission and returns to the emergency department for elderly patients. Acad Emerg Med 2010;17(3):252-9. (PMID:20370757).

Lim KH, Yap KB. The presentation of elderly people at an emergency department in Singapore. Singapore Med J 1999; 40:742-4. (PMID:10709424).

McCaig LF, Nawar EW. National Hospital Ambulatory Medical Care Survey: 2004 emergency department summary. Adv Data 2006; 372:1-29. (PMID:16841785).

Mert E. Geriatrik Hastaların Acil Servis Kullanımı. Türk Geriatri Dergisi 2006;9(2):70-4.

Ross MA, Compton S, Richardson D, Jones R, Nittis T, Wilson A. The use and effectiveness of an emergency department observation unit for elderly patients. Ann Emerg Med 2003;41(5):668-77. (PMID:12712034).

Satar S, Sebe A, Avcı A, Karakuş A, İçme F. Yaşlı hasta ve acil servis (The elderly patient and emergency department). Çukurova Üniversitesi Tıp Fakültesi Dergisi 2004;29(2):43-9.

Singal BM, Hedges JR, Rousseau EW, et al. Geriatric patient emergency visits. Part I: Comparison of visits by geriatric and younger patients. Ann Emerg Med 1992;21(7):802-7. (PMID:1610036).

Sinoff G, Clarfield AM, Bergman H, Beaudet M. A two-year follow-up of geriatric consults in the emergency department. J Am Geriatr Soc 1998;46(6):716-20. (PMID:9625187).

Strange GR, Chen ER. Use of emergency departments by elder patients: a five-year follow-up study. Acad Emerg Med 1998;5(12):1157-62. (PMID:9864128).

Strange GR, Chen EH, Sanders AB. Use of emergency departments by elderly patients: projections from a multicenter data base. Ann Emerg Med 1992;21(7):819-24. (PMID: 1610039).

Şahin S, Boydak B, Savaş MS, Yalçın A, Akçiçek F. Acil servise başvuran 65 yaş ve üzeri hastaların özellikleri (Characteristics of patients aged 65 and over in the emergency department). Akademik Geriatri Dergisi 2011; 3:41-6.

Ünsal A, Çevik AA, Metintaş S, Arslantaş D, İnan OÇ. Yaşlı hastaların acil servis başvuruları. (Emergency department visits by elder patients). Türk Geriatri Dergisi 2003;6(3):83-8.

Vanpee D, Swine C, Vandenbossche P, Gillet JB. Epidemiological profile of geriatric patients admitted to the emergency department of a university hospital locatized in a rural area. Eur J Emerg Med 2001;8(4): 301-4. (PMID:11785598).

Wofford JL, Schwartz E, Timerding BL, Folmar S, Ellis SD, Messick CH. Emergency department utilization by the elderly: analysis of the National Hospital Ambulatory Medical Care Survey. Acad Emerg Med 1996;3(7):694-9. (PMID:8816186).

Indexed / Listed İn

PLEASE CLICK ON THE PICTURE TO ACCESS JOURNAL INDEX INFORMATION

ESJI Eurasian Scientific Journal Index www.ESJIndex.org	Eurasian Scientific Journal Index (ESJI)
Academic Resource Index ResearchBib	ResearchBible (Academic Resource Index)
DRJI Directory of Research Journals Indexing	Directory of Research Journals Indexing (DRJI)
SOBIAD	SOBİAD Atıf Dizini
SIS	Scientific Indexing Services (SIS)
ROOTINDEXING JOURNAL ABSTRACTING AND INDEXING SERVICE	Root Society for Indexing and Impact Factor Service
ActiveSearchResults	Active Search Results Engineer (ASR)
2017 I2OR I2OR awards	I2OR Indexing Services & Evaluation of Publication Impact Factor (PIF)