



Sociodemographic and clinical characteristics and hospitalization costs of the patients in a psychiatry ward of a training and research hospital

Bir eğitim ve araştırma hastanesi psikiyatri servisinde yatan hastaların sosyodemografik, klinik özellikleri ve yatış maliyetleri

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Abstract

Objective: Cost of the mental disorders for the community is high because of their frequency, recurrence or chronic course. Aim of the present study was to evaluate sociodemographic, clinical characteristics and hospitalization cost for one year of the patients in a psychiatric clinic.

Materials and Methods: Medical files and hospitalization bills were reviewed retrospectively of the patients treated in during one year. Annual average in-patient cost was calculated by multiplying average cost of hospitalization and average annual number of hospitalization.

Results: Mean age of 177 patients was 44.5 ± 12.9 years; 50.3% of the patients were female. Average number of hospitalizations in a psychiatry clinic was 1.69 ± 1.33 , average number of hospitalization in one year was 1.18 ± 0.40 , and average duration of hospitalization was 24.12 ± 16.33 days. 48.0% of the patients had unipolar depression, 17.5% had bipolar disorder, 17.5% had schizophrenic-psychotic disorder, and 17% had other psychiatric conditions. Average cost of hospitalization per patient was 2227.29 ± 1489.91 Turkish Liras (TL) (815.12 ± 544.94 US\$). Daily hospitalization cost was found to be 92.34 ± 91.23 TL (37.79 ± 33.38 US\$). The highest hospitalization cost was for schizophrenic and psychotic disorders (106 ± 29.2 TL; 38.79 ± 10.68 US\$)

Conclusion: We found the highest hospitalization rates in unipolar depression group and highest hospitalization costs in schizophrenia and psychotic disorders group. There are few studies from our country investigating which diagnostic groups are more frequently hospitalized and the direct diagnostic costs. Multicenter studies on this subject would be helpful in planning number and quality of the psychiatry wards and policies of mental health.

Keywords: Psychiatric Disorder; In-Patient; Cost.

Öz

Amaç: Ruhsal bozuklukların sık görülmeleri, tekrarlamaları ya da kronik gidişleri nedeniyle topluma maliyeti yüksektir. Bu çalışmanın amacı bir psikiyatri kliniğinde yatan hastaların sosyodemografik, klinik özelliklerini ve bir yıllık yatış maliyetini değerlendirmektir.

Gereç ve Yöntemler: 1 yılda yatarak tedavi gören hastaların dosyaları ve yatış faturaları geriye dönük olarak incelendi. Yıllık ortalama yatan hasta maliyeti, yatarak tedavi görmenin ortalama maliyeti ile yıllık ortalama yatış sayısı çarpılarak hesaplandı.

Bulgular: 177 hastanın ortalama yaşı 44.5 ± 12.9 yıl, %50.3'ü kadın, %49.7'si erkekti. Ortalama yatış sayısı 1.69 ± 1.33 kez, 1 yıllık ortalama yatış sayısı 1.18 ± 0.40 kez, ortalama yatış süresi 24.12 ± 16.33 gündü. Hastaların %48.0'ı unipolar depresyon, %17.5'i bipolar bozukluk, %17.5'i şizofreni-psikotik bozukluk, %17'si diğer ruhsal hastalıklar grubundaydı. Bir hastanın ortalama yatış maliyeti 2227.29 ± 1489.91 Türk Lirası (TL) (815.12 ± 544.94 ABD Doları (\$)), günlük yatış maliyeti ise 92.34 TL \pm 91.23 TL (37.79 ± 33.38 \$) bulundu. En yüksek günlük yatış maliyeti şizofreni ve psikotik bozukluklar grubunda idi (106 ± 29.2 TL, 38.79 ± 10.68 \$). **Sonuç:** En yüksek yatış oranı unipolar depresyon iken en yüksek yatış maliyeti şizofreni ve psikotik bozukluklar grubunda bulundu. Ülkemizde, psikiyatri servislerine hangi tanı gruplarının daha sık yatırıldığı ve doğrudan tedavi maliyetlerinin araştırıldığı çalışmalar azdır. Bu yönde yapılacak çok merkezli araştırmalar, psikiyatri servislerinin sayısının ve niteliğinin planlanmasında ve ruh sağlığı politikalarının geliştirilmesinde yol gösterici olacaktır.

Anahtar Kelimeler: Psikiyatrik Hastalık; Yatan Hasta; Maliyet.

Accepted/Kabul: 18.08.2016
Received/Başvuru: 29.09.2016

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How to cite this article/Atıf için

Erdogan E, Delibas DH, Baskin EP.
Sociodemographic and clinical
characteristics and hospitalization
costs of the patients in a psychiatry
ward of a training and research
hospital. J Turgut Ozal Med Cent
2016;23(4):402-8

INTRODUCTION

Psychiatric disorders cause incapacity due to their high frequency, recurrent nature and chronic course (1, 2). When all diseases and injuries were evaluated in a study from our country on national disease burden, neuropsychiatric diseases made 13.3% of total disease-burden and ranked second in the list of basic disease groups after the cardiovascular diseases (3). For the psychiatric patients, hospitalization is required because of such reasons as ordering the treatment, removal from the environment of crisis, impaired oral intake, risk of self-destruction and aggressiveness, and advanced disorganized and inappropriate behaviors. It has been suggested that behavioral aspect of the disease and lack of social support is responsible for long duration of hospitalization (4). It has been reported that good clinical practice in society following discharge reduces risk of re-hospitalization (4, 5).

Cost for treatment and rehabilitation of the psychiatric diseases varies among the countries as well as in time. These differences vary depending on population and structure of the health systems in the countries, frequency of the diseases, and methods for calculating the cost (6-9). The domains constituting cost of the psychiatric disorders for which spending is made is also of importance. Total cost of a disease is sum of its direct and indirect costs. Direct cost may be organized as direct health-care expenses and direct non-medical expenses. Direct health-care expenses include cost of in-patient treatment, medication costs, out-patient treatment costs, and cost for medical devices. Direct non-medical costs consist of such expenses as those for social-work and patient transfer. Indirect costs consist of expenses due to work absenteeism, early retirement, and early death [10]. In Europe, indirect costs accounts for 50% of average total indirect costs for the psychiatric disorders but its distribution varies among the countries. Share of indirect cost in total cost is 35% in Italy, 59% in Swiss, 61% in Denmark, and 63% in Finland. Thus, the most important part of the cost for psychiatric disorders belongs to indirect costs. Direct health-care expenses in total costs for psychiatric disorders ranks second. The biggest share in direct health-care expenses belongs to in-patient therapeutic services (9, 11-13). For example, in 2013 a study on schizophrenia from the US reported that direct health services costed 37.7 billion US\$, direct non-medical services 9.3 billion US\$, indirect services 117.3 billion US\$, and that total burden on the economy was 155.7 billion US\$ (14).

There are few studies from our country investigating cost of psychiatric disorders. There is not any study reporting hospitalization cost of in-patients in a psychiatry ward of a public hospital in Turkey. The present study aimed to investigate sociodemographic and clinical characteristics and hospitalization cost of the patients hospitalized in Izmir Bozyaka Training and Research Hospital between January 1st 2015 and January 1st 2016.

MATERIALS and METHODS

The present study was designed retrospectively. Approval was taken for the present study from ethics board of our hospital. Medical files of the patients hospitalized in our clinic between January 1st 2015 and January 1st 2016 were reviewed. A total of 177 patients with available information were included in the study. The following features were reviewed: diagnosis at the time of discharge, age, gender, place of birth, educational status, marital status, employment, socioeconomic level, health insurance, family structure, history of psychiatric disease, history of suicidal attempt, history of psychiatric disease in relatives, duration of hospitalization, number of the previous hospitalizations, season of hospitalization, bill of discharge, absence of medical conditions, whether consultation was ordered or not, and features of medications. Evaluation of treatment costs was based on bundle pricing in the section of "psychiatric services for the treatments in hospital" of 2015 Bulletin of Health Practices (BHP). Exchange rate of dollar was accepted as 1 US\$ = 2.7324 TL based on 2015 data from the official website of Turkish Central Bank. Bills from the data processing system after discharge (PROBEL) were reviewed. Direct treatment cost for the patients was accepted as total amount on this bill (including costs for examination, consultation, bed and companion prices, mental tests when necessary, EEG, ECG, CT, MRI, weekly blood level determination of the certain drugs, family interviews, individual and group psychotherapies, individual care of the patient, graphics, laboratory investigations). Average annual in-patient cost was calculated by multiplying average cost of hospitalization and average annual number of hospitalizations. The study included only the patients who were hospitalized in our clinic. The data were analyzed using SPSS v.15.0. For comparing the differences among the diagnostic groups, tests of chi-square, independent samples t, Kruskal-Wallis and Mann-Whitney U were used. For all statistical tests, p values less than 0.05 were considered as significant.

RESULTS

The group of patients consisted of 88 men (49.7%) and 89 women (50.3%) aged between 18 and 75 years. Mean age was 44.5±12.9 years. 90.4% of the patients were living in urban centers (n=160) and 9.6% of them were from rural locations. Most of the patients were graduate of primary school (n=105, 60.7%). Of the patients, 55.7% (n=99) were married, 23.7% (n=43) were single, and 20.3% (n=36) were living apart from his/her spouse. 47.5% (n=84) of the patients were unemployed, 27.7% (n=49) were employed, 20.9% (n=37) were house wife, 2.8% (n=5) were retired, and 0.6% (n=1) was student. 98.9% (n=175) of the patients had social insurance. 61.0% (n=108) of them had low socioeconomic level. 23.2% (n=41) of the patients had history of self-destruction and 16.4% (n=29) had history of psychiatric disease in the relatives. When diagnostic groups was compared based on age of onset of disease with Kruskal-Wallis test, statistically significant difference were found between groups (p=0.000). Mean value of age of onset of disease for each group is given in Table 1. In pairwise comparisons

in order to determine which diagnostic group had the statistical significance with independent samples t test, groups of schizophrenia-psychosis ($t=2.825$; $p=0.007$) and bipolar disorder ($t=-3.225$; $p=0.002$) had equal mean value of age of onset of disease, but they were lower than the other groups (Schizophrenia-psychosis = Bipolar < Unipolar = Others).

The marital status between the groups were statistically significant ($p=0.01$). Evaluating the pairwise comparison of groups, the ratio of being single ($t=-3.330$; $p=0.001$) were high in group of schizophrenia-psychosis. (Schizophrenia-psychosis > Bipolar = Unipolar = Others). Comparison of sociodemographic characteristics by diagnostic groups is given in Table 1.

Table 1. Comparison of sociodemographic and clinical characteristics between the diagnostic groups

	Unipolar (n=85)	Bipolar (n=31)	Schizoph. (n=31)	Others (n=30)	P
Age (mean ± sd), y	44.8±13.1	43.3±10.2	41.6±13.9	47.6±13.7	0.410*
Gender					
Female	50 (56.2%)	15 (16.9%)	12 (13.5%)	12 (13.5%)	0.141**
Male	35 (16.9%)	16 (18.2%)	19 (21.6%)	18 (20.5%)	
Age of onset of disease, y	38.7±13.3	28.2±7.8	28.6±11.5	39.2±16.7	0.000*
Marital Status					
Married	52 (53.1%)	17 (17.3%)	10 (10.2%)	20 (19.4%)	0.01*
Divorced	18 (50.0%)	6 (16.7%)	7 (19.4%)	5 (13.9%)	
Single	15 (35.7%)	8 (19.0%)	14 (33.3%)	5 (11.9%)	
Duration of education, y	8.5±3.8	8.2±4.2	7.1±3.9	7.3±3.9	0.169*
Family history of mental disorder					
Yes	15 (51.7%)	4 (13.8%)	4 (13.8%)	6 (20.7%)	0.817**
No	70 (47.3%)	27 (18.2%)	27 (18.2%)	24 (16.2%)	
Comorbid medical illness					
Yes	27 (56.3%)	6 (12.5%)	8 (16.7%)	7 (14.6%)	0.548**
No	58 (45.0%)	25 (19.4%)	23 (17.8%)	23 (17.8%)	
Readmission to hospital					
Yes	28 (47.5%)	10 (16.9%)	13 (22.0%)	8 (13.6%)	0.647**
No	57 (48.3%)	21 (17.8%)	18 (15.3%)	22 (18.6%)	
Duration of hospitalization, d	25.5±16.5	19.1±13.2	21.4±15.5	27.9±18.3	0.121*

y:year; d: day; *test of Kruskal-Wallis; **test of chi-square

When distribution of diagnoses of the patients was reviewed based on classification of American Psychiatry Association (DSM-IV) 48.0% (n= 85) of the patients had unipolar depression, 17.5% (n= 31) had bipolar disorder, 17.5% (n= 31) had schizophrenia-psychosis, and 17% had other disorders (15). Anxiety disorders, adjustment

disorder, disorders related to alcohol and substance use, dementia, and organic mental disorders were collected under the heading of "others" because there were few patients with disorders compared to other diagnostic groups in order to compare the variables between the diagnostic groups. In the "Other" diagnostic group, there were 30 (16.9%) patients (Table 2).

Table 2. Distribution of diagnoses by psychiatric disorders

	Number of patients (n)	%
Unipolar Depression	85	48
Bipolar Disorder	31	17.5
Schizophrenia and other psychotic disorders	31	17.5
Others*	30	17

*Anxiety disorders, adjustment disorder, disorders related to alcohol and substance use, dementia, and organic mental disorders

26.6% (n=47) of the patients had organic disease. Consultation was requested from other clinics for 32.2% (n = 57) of the patients. Rate of the patients who were previously hospitalized in a psychiatry clinic was 33.3% (n=59). Average annual number of hospitalization of the patients in our clinic in 2015 was 1.18±0.40. The highest number of repeat hospitalization was in the group of schizophrenia and psychotic disorders (number of hospitalization=1.35±0.55). Average number of hospitalization for one year was 1.12±0.33 in the group of unipolar depression, 1.12±0.34 in the group of bipolar disorder, and 1.20±0.41 in the group of "other" diagnoses. When average number of hospitalization for one year were compared between the diagnostic groups with Kruskal-Walis test, significant difference was found ($p=0.015$). In pairwise comparisons with Mann-Whitney

U test in order to determine which diagnostic groups have the significant difference, average number of hospitalization for one year in patients with diagnosis of schizophrenia and psychosis were higher than the other groups ($z=-1.007$, $p=0.005$). 53.1% (n=94) of the patients were hospitalized in winter.

There was no statistical significant difference in season of hospitalization between the diagnostic groups with Kruskal-Wallis test ($p=0.954$). Distribution of season of hospitalization by diagnoses is presented in Table 3. 32.2% (n=57) of the patients were using combination of antidepressants and antipsychotics, 22.0% (n=39) of them were using antidepressants, 13.6% (n=24) were using antipsychotics, 11.9% (n=21) were using mood stabilizers, and 7.9% (n=14) were using multi-drug combinations.

Table 3. Distribution of the psychiatric diagnoses by season of hospitalization

Season of hospitalization	DIAGNOSTIC GROUPS (n, %)				Total n (%)	P*
	Unipolar Depression	Bipolar Disorder	Schizophrenia- psychotic disorders	Others		
Winter	47 (55,3%)	16 (51,6%)	15 (48,4%)	16 (53,3%)	94 (53.1%)	0.954
Spring	15 (17,6%)	9 (29,0%)	8 (25,8%)	6 (20,0%)	38 (21,5%)	
Summer	11 (12,9%)	4 (12,9%)	3 (9,7%)	6 (20,0%)	24 (13,6%)	
Autumn	12 (14,1%)	2 (6,5%)	5 (16,1%)	2 (6,7%)	21 (11,9%)	

*Kruskal-Wallis Testi (p<0.005 =statistically significant)

Average duration of hospitalization for whole sample was 24.12±16.33 days (min:1-max:70 days) Average annual cost of hospitalization for all patients was 2227.29±1489.91 TL (815.12±544.94 US\$) while average daily cost of hospitalization was 92.34±91.23 TL (37.79±33.38 US\$). There was no statistically significant difference among the groups in annual total hospitalization costs with Kruskal-Wallis test (p=0.496). The highest annual (3019.84±2145.73 TL; 1105.19±785.29 US\$) and daily (106±29.2TL; 38.79±10.68 US\$) hospitalization costs were in the diagnostic group of schizophrenia and psychotic disorders. The second highest daily hospitalization cost

was found in the group of bipolar disorder (97.3 ± 26.2 TL). But statistically significant difference was found among the groups only in daily hospitalization cost with Kruskal-Wallis test (p =0.000). In pairwise comparison of groups with t test, group of schizophrenia and psychotic disorders had higher daily hospitalization cost than all groups (t=-2.544; p=0.014), and the other diagnostic groups had no significant difference between each other (Schizophrenia-psychosis>Bipolar=Unipolar=Others).

Comparison of average duration of hospitalization and cost among the diagnostic groups is presented in Table 4.

Table 4. Comparison of the diagnostic groups by number and duration of hospitalizations, average daily cost of hospitalization, and total cost of hospitalization for one year

	DIAGNOSTIC GROUPS (mean ± sd)				P**
	Unipolar Depression	Bipolar Disorder	Schizophrenia-psychotic disorder	Others	
Number of hospitalization	1,68±1,31	1,54±0,85	1,70±1,10	1,89±1,95	0,947
Duration of hospitalization, d	25.56±16.55	19.16±13.25	21.42±15.59	27.97±18.35	0.121
Average daily cost of hospitalization (TL)**	90.7±17.2	97.3±26.2	106.1±29.2	89.4±21.1	0.000
Total cost of hospitalization for one year, TL***	2594.45±1646.1	2141.04 ±1545.66	3019.84±2145.73	2330,40±1550,93	0.496

*Kruskal-Wallis Testi (p<0.005 =statistically significant)

** Average daily cost of hospitalization was calculated with the following formula: average cost/average length of hospital stay.

*** Average annual in-patient cost was calculated by multiplying average cost of hospitalization and average number of annual hospitalizations.

DISCUSSION

Main objectives of therapeutic interventions include living of the individuals with psychiatric diseases in community and their engagement in active roles in the society (16). Objective of treating the patients by hospitalizing them is to ensure that they receive the most appropriate treatment and then to allow them to maintain their functionality in the society. Therapeutic cost of the psychiatric diseases or cost burden on the society and the economic system is a serious issue that should be paid attention. Our hospital is a tertiary public hospital with a psychiatry clinic with 25 beds and our clinic has not high security conditions. A community mental health center (CMHC) related to our clinic in our hospital provides services of psychosocial rehabilitation of patients with diagnosis of schizophrenia, psychosis and bipolar disorder. Discharged patients are connected to CMHC by their doctors, trainings of psychosocial skills, home visits and psychoeducation for caregivers are organized by the team of CHMC. Last year 359 patients

were enrolled in the center. The daily number of people still continuing to the center is about 16-20. In year of 2015, home visits were made 48 times, treatment options and social needs of the patients were determined.

Bills of the patients discharged are estimated based on bundle pricing according to the diagnostic group in the BHP announced by the social security institute. Therefore, other expenses such as personnel salaries, electricity, water and consumption materials did not include in the calculation. In the present study, average hospitalization cost of the patients hospitalized in our clinic was found to be 2227.29 TL (815.12US\$) and average daily hospitalization cost was found to be 92.34 TL (37.79 US\$). The highest average daily hospitalization cost was found in group of schizophrenia and psychosis.

When distribution of diagnoses of the patients was reviewed, most of the patients who were hospitalized in our clinic had unipolar depression, similar with the

studies on in-patients in our country (17-19). Schizophrenia and psychotic disorders, and bipolar disorder shared the second rank in distribution of the diagnostic groups. Being single, earlier onset of the disease and higher number of hospitalization for one year were statistically significant in the schizophrenia and psychotic disorder compared to other diagnostic groups, being consistent with nature of the psychotic disorders (16).

Duration of hospitalization was 21.4 days in the group of schizophrenia and psychotic disorders and no statistically significant difference was found among the diagnostic groups. Average duration of hospitalization for the schizophrenic patients was found as 37.42 days in the study by Yildiz and Cerit, as 38.4 days in the study by Ulas and Tunca, and as 49.7 days in the study by Çaliskan (18-20). In another study, average duration of hospitalization was reported as 23.8 days for the patients hospitalized in the psychiatry clinic of a military hospital (21). It was considered that average duration of hospitalization was shorter in our study compared to others because the patients with severe psychiatric disorders couldn't be hospitalized in our clinic due to physical conditions (lack of isolation room, high security and ECT) of our clinic. It has been reported in the literature that 10 to 30% of the patients required long-term hospitalization. But there is not consensus on which patients require long-term hospitalization. Duration of the long-term hospitalizations varies between 24 and 179 days in several studies (22). Some researchers have defined the hospitalizations shorter than 30 days as short-term, and those longer than 30 days as long-term hospitalization (4, 23, 24). For our clinic, rate of the patients requiring long-term hospitalization was 36% (n=64) with most of such patients being in the group of unipolar depression (n=37). In the study by Yildiz et al., it was commented that duration of hospitalization increased as degree of psychopathology increased (17).

In our country, cost of hospitalization was calculated for all diagnostic groups in two studies and only for the patients with diagnosis of schizophrenia in other two studies [18, 19, 20, 25]. In the present study, average annual cost of hospitalization was 3019.84 TL (1105.19 US\$) for schizophrenia and other psychotic disorders. Average cost of hospitalization for the schizophrenic patients was 1091 US\$ in the study by Yildiz and Cerit, and 2685 TL in the study by Çaliskan et al. [18-20]. In the present study, the highest cost was in the group of schizophrenia and other psychotic disorders. Average annual cost of hospitalization was found to be lower in the present study compared to other studies from our country. Reasons for this included differences in exchange rate of dollar among years of performing the studies and the fact that average duration of hospitalization in the present study was relatively shorter (17-19).

When daily hospitalization costs were reviewed based on diagnostic groups, schizophrenia and psychotic disorders ranked first with 106.1 TL (37.2 US\$) followed by bipolar disorders with 97.3 TL (35.6 US\$). In a study investigating hospitalization cost of bipolar disorder in

Sweden between 1997 and 2005, average daily cost of hospitalization was reported as €375 (26). For the daily cost of hospitalization in the present study, unipolar depression ranked third with 89.4 TL (32.7 US\$) and other diagnoses ranked fourth with 89.4 TL (32.7 US\$). "European Study Group on Cost of Brain Diseases" investigated cost of a total of 12 diseases including psychotic disorders, affective disorders, anxiety disorders, and dependence in 28 European countries and total cost of psychiatric diseases in Europe was calculated to be 240 billion Euro (€). In Europe, the disease with the highest cost is affective disorders including depression and bipolar disorder with annual cost of 106 billion €. It is followed by alcohol and substance dependence with 57 billion €, anxiety disorders with 41 billion €, and schizophrenia with 35 billion €. Germany is at top of the list of expenses with annual cost of about 81 billion €. But when annual cost per patient is considered, the biggest share in Europe for each group of disease was found to be allocated by Swiss. When cost of psychiatric diseases were compared between Europe and the United States, it was seen the cost of psychiatric diseases was higher in the US despite similar population characteristics. It has been reported that annual cost of psychiatric diseases in the US ranges from 269 to 538 billion US\$. Total cost of dependence of alcohol and other substances accounts for difference in cost between Europe and the United States. Total cost of alcohol and substance dependence is 57 billion Euro in Europe whereas it has been reported to range between 160 and 389 billion Euro (9).

Average daily cost of hospitalization is 92.34 TL (37.79 US\$) in the present study while it is 375 € in Switzerland and ranges between 369 and 440 US\$ in the group of adolescent psychiatric patients (8, 26). In a study investigating the average daily cost of hospitalization in France, Germany, and England, average daily costs were found as 243 €, 260 €, and 251 €, respectively (7). Share of the budget allocated to mental health in the total health budget in Turkey is unknown. Furthermore, overall cost of treatment should be known in order to analyze the cost-effectiveness robustly.

When average daily cost of hospitalization was compared with the clinic of physical therapy and rehabilitation unit (149.81 TL, 54.82 \$), which has similar bed capacity, our clinic had lower cost of daily hospitalization. So it may be said that the cost of hospitalization of psychiatric disorders is not high when compared to other medical diseases, and increasing inpatient psychiatric services should not be avoided by government. The way to finance the mental health services will determine to what extent the mental health services would be accessible and inclusive. It was reported by Ministry of Health that a budget of averagely 1.7 million TL was required from 2011 to 2016 in order to implement Action Plan of Mental Health [27]. Lack of sufficient budget to the mental health services leads to some problems. Mental hospitals cannot invest to renew themselves and representatives of the private sector avoid giving in-patient services of mental health. Policy of charging should be revised in order for the private sector to invest and for the mental hospital to renew themselves. Anticipations on cost of diseases at

national scale could provide the policy-makers with valuable information that may help them in making decisions on source allocation at macro level. Preventive approaches and adherence to treatment is important in reducing the therapeutic cost of the psychiatric diseases to society. Ensuring regular visits at follow-up of outpatients, providing close follow-up at recurrence and acute episodes, working in collaboration with CMHC are main supporting steps of treatment compliance. CMCHs are the main part of community based psychiatry model in which the target depends on following frequently the patients with severe mental illness who are living in a catchment area, arranging their medicine and rehabilitation in order to adapt them back to community. We believe that the effective operation of the CMHCs will reduce the cost of inpatient care by decreasing rehospitalization rates and will raise readaption of patients to community in the following process.

Limitations of the present study include the facts that it was single-center, direct nonmedical costs and indirect costs not included in the hospitalization costs of disease groups were not calculated, and low number of patients in other diagnostic groups.

CONCLUSION

Although there are few studies to investigate total cost for psychiatric diseases in our country, it can be seen that our cost of hospitalization is quite lower compared to the studies from Europe and United States. We believe that low rate of cost is further supported by difficulties of accessing psychiatric services considering the rate of population in our country, low number of psychiatric beds per capita, and failures in maintaining the treatment. In our clinic, the highest rate of hospitalization was in the group of unipolar depression, and the highest average annual cost of hospitalization was found in schizophrenia and psychotic disorders. We believe that such studies would provide important data in this field although they have methodological limitations. More efficient use of the sources, providing more effective services of mental health and developing them would be possible by the means of studies to be planned in this field in which direct and indirect costs would be investigated.

This study was presented as poster in 20th Clinical Training Symposium in Turkey. The authors thank to medical secretary of Psychiatry Clinic of Izmir Bozyaka Training and Research Hospital "Tuba Oztaskın Gövbakan" for her assistance in collecting data.

REFERENCES

1. Andersen SM, Harthorn BH. The recognition, diagnosis, and treatment of mental disorders by primary care physicians. *Med Care* 1989;27(9):869-86.
2. Gonzales JJ, Magruder KM, Keith SJ. Mental disorders in primary care services: an update. *Public Heal Rep.* 1994;109(2):251-8.
3. Ünüvar N, Mollahaliloğlu S, Yardım N (ed), Türkiye hastalık yükü çalışması. Ankara, 2006, p.21.
4. Zhang J, Harvey C, Andrew C. Factors associated with length of stay and the risk of readmission in an acute psychiatric inpatient facility: a retrospective study. *Aust N Z J Psychiatry* 2011;45(7):578-85.
5. Sytema S, Burgess P, Tansella M. Does community care decrease length of stay and risk of rehospitalization in new patients with schizophrenia disorders? A comparative case register study in Groningen, The Netherlands; Victoria, Australia; and South-Verona, Italy. *Schizophr Bull* 2002;28(2):273-81.
6. Salize HJ, McCabe R, Bullenkamp J, Hansson L, Lauber C, Martinez-Leal R, et al. Cost of treatment of schizophrenia in six European countries. *Schizophr Res* 2009;111(1-3):70-7.
7. Heider D, Bernert S, König H-H, Matschingeret H, Hogha T, Brughac ST, et al. Direct medical mental health care costs of schizophrenia in France, Germany and the United Kingdom - findings from the European Schizophrenia Cohort (EuroSC). *Eur Psychiatry* 2009;24(4):216-24.
8. Costello EJ, Copeland W, Cowell A, Keeler G. Service costs of caring for adolescents with mental illness in a rural community, 1993-2000. *Am J Psychiatry* 2007;164(1):36-42.
9. Andlin-Sobocki P, Jönsson B, Wittchen H-U, Olesen J. Cost of disorders of the brain. *Eur J Neurol* 2005;12:1-27.
10. Olesen J, Sobscki P, Truelsen T, Sestoft D, Jönsson B. Cost of disorders of the brain in Denmark. *Nord J Psychiatry* 2008;62(2):114-20.
11. Pugliatti M, Sobocki P, Beghi E, Pini S, Cassano GB, Altamura AC, et al. Cost of disorders of the brain in Italy. *Neurol Sci* 2008;29(2):99-107.
12. Sillanpää M, Andlin-Sobocki P, Lönqvist J. Costs of brain disorders in Finland. *Acta Neurol Scand* 2008;117(3):167-72.
13. Olesen J, Gustavsson A, Svensson M, Wittchen HU, Jönsson B. The economic cost of brain disorders in Europe. *Eur J Neurol* 2012;19(1):155-62.
14. Cloutier M, Aigbogun MS, Guerin A, Nitulescu R, Ramanakumar AV, Kamat SA, et al. The Economic Burden of Schizophrenia in the United States in 2013. *J Clin Psychiatry* April 2016.
15. American Psychiatric Association: Diagnostic and statistical Manual of Mental disorders, Fourth Edition. Washington DC: American Psychiatric Association (1994) Türkçe'ye çeviri: Mental Bozuklukların Tanısal ve Sayımsal El Kitabı. 4. Baskı, çeviri editörü: E. Köroğlu, Ankara, Hekimler Yayın Birliği, 1995.
16. Orhan MÖ, Uluşahin A. Ruh Sağlığı ve Bozuklukları, onikinci baskı, Ankara, Nobel Tıp Kitabevi, 2015.
17. Yıldız A, Onur E, Turgut K, Tunca Z. Bir Üniversite Hastanesi Psikiyatri Kliniğinde Hasta Yatış Sürelerini Etkileyen Faktörler. *Klin Psikofarmakol Bülteni* 2003;13:122-8.
18. Ulaş H, Tunca Z. Bir Üniversite Hastanesi Psikiyatri Kliniğinde Yatan Hastaların Maliyet Analizi. *Nöro Psikiyatri Arşivi* 2011;48(3):1-1.
19. Çalıřkan S. SDÜ Fakültesi Psikiyatri Kliniğinde 2005-2009 yılları arasında yatan hastaların sosyodemografik özellikleri, tanı dağılımı ve tedavi maliyetlerinin değerlendirilmesi. Yayınlanmamış uzmanlık tezi, Süleyman Demirel Üniversitesi Tıp Fakültesi, Isparta, 2010.
20. Yıldız M, Cerit C. Şizofreni tedavisinin yıllık maliyeti: Bir üniversite hastanesi verilerinden yapılan hesaplama. *Klin Psikofarmakol Bülteni* 2006;16:239-44.
21. Evrensel A, Balıbey H, Tarhan N. Clinical Features and Length of Stay of Inpatients in the Psychiatric Ward of A

- Military University Hospital: One-Year Review Med Sci 2015;1.
22. Stevens A, Hammer K, Buchkremer G. A statistical model for length of psychiatric in-patient treatment and an analysis of contributing factors. *Acta Psychiatr Scand.* 2001;103(3):203-11.
 23. Eisenberg JM. Clinical economics. A guide to the economic analysis of clinical practices. *JAMA.* 1989;262(20):2879-86.
 24. Priebe S, Badesconyi A, Fioritti A, Hansson L, Kilian R, Torres-Gonzales F, et al. Reinstitutionalisation in mental health care: Comparison of data on service provision from six European countries. *BMJ* 2005;330(7483):123-6.
 25. Tav AŞ. Şizofreni tedavisinde direk maliyeti belirleyen değişkenlerin karşılaştırılması değerlendirilmesi. Yayınlanmamış uzmanlık tezi, İstanbul, Sağlık Bakanlığı Bakırköy Ruh ve Sinir Hastalıkları Eğitim ve Araştırma Hastanesi, 4. Psikiyatri Birimi, 2006.
 26. Ösby U, Tiainen A, Backlund L, Edman G, Adler M, Hallgren J, et al. Psychiatric admissions and hospitalization costs in bipolar disorder in Sweden. *J Affect Disord* 2009;115(3):315-22.
 27. T.C. Sağlık Bakanlığı, Ulusal Ruh Sağlığı Eylem Planı (2011-2023), Ankara, 2011, p:62 <http://www.saglik.gov.tr/TR/dosya/1-73168/h/ulusal-ruh-sagligi-eylem-planı.pdf>