Turkish Journal of Diabetes and Obesity / *Türkiye Diyabet ve Obezite Dergisi*
Original Article / Özgün Araştırma

A Research on Determination of out-of-Pocket Payment Costs of Type 2 Diabetes Mellitus Patients

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Cite this article as: Kafes M and Kaya D. A research on determination of out-of-pocket payment costs of type 2 diabetes mellitus patients. Turk J Diab Obes 2021;3: 270-278.

ABSTRACT

Aim: This study aimed to determine the out-of-pocket payment costs of the Type 2 Diabetes patients due to and associated with the disease.

Material and Methods: This study with a descriptive design qualifies. The sample of the study consisted of the patients diagnosed with Type 2 Diabetes, who applied to a university hospital. In line with the calculated sample number, the study was performed through the face-to-face interviews made with 180 participants.

Results: In terms of out-of-pocket payment costs, individual average cost figures within the two patient groups being service and policlinic, are TL 350.59 for service patients, whereas TL 1046.26 for policlinic patients. The total out-of-pocket cost within both patient groups was calculated as TL 111,309,442.

Conclusion: It is seen that the substantial part of the cost for the patients, special footwear and socks, which result from the diseases developing in consequence of complication, such as Diabetic Foot, and which are required to be used. From this aspect, increase of the state's support to the patients with regard to reduction of the out-of-pocket payment costs of the patients, or switching to domestic production for the instruments used, and inducement of the patients in this direction, will play an important role in decreasing the costs.

Keywords: *Type 2 diabetes, Health expenditures, Cost of illness*

Tip 2 Diyabet Mellitus Hastalarının Cepten Ödeme Maliyetlerinin Belirlenmesi Üzerine Bir Araştırma

ÖZ

Amaç: Bu çalışma, Tip 2 Diyabet hastalarının hastalığa bağlı ve ilişkili cepten ödeme maliyetlerini belirlemeyi amaçlamaktadır.

Gereç ve Yöntemler: Tanımlayıcı tipte olan bu çalışma aynı zamanda maliyet araştırması niteliği taşımaktadır. Çalışmamıza Endokrinoloji ve Metabolizma Hastalıkları Bilim Dalı polikliniğine başvuran 40 aşikâr hipotiroidi, 40 subklinik hipotiroidi tanısı almış hastalarla 30 sağlıklı birey karşılaştırıldı. Gruplar demografik bulgular, serum lipid ve tiroid hormon panelleri, serum K-YABP ve KIMK ölçümleri açısından karşılaştırıldı. Ayrıca aşikâr hipotiroidi nedeniyle 6 aylık levotiroksin replasman tedavisi alan hastaların tedavi öncesi ve sonrası serum K-YABP ve KIMK ölçümleri karşılaştırıldı. Çalışmanın örneklemini bir üniversite hastanesine başvuran Tip 2 Diyabet tanılı hastalar oluşturmaktadır. Hesaplanan örneklem sayısı doğrultusunda çalışma, 180 katılımcı ile yüz yüze yapılan görüşmeler ile gerçekleştirilmiştir.

Bulgular: Cepten ödeme maliyetleri açısından servis ve poliklinik olmak üzere her iki hasta grubu içinde ayrı ayrı ortalama maliyet rakamları, servis hastalarında 350,59 TL iken; poliklinik hastalarında 1046,26 TL olduğu görülmektedir. Her iki hasta grubu içinde yapılan toplam cepten ödeme maliyeti 111,309,442 TL olarak hesaplanmıştır.

Sonuç: Hastalar açısından maliyetin büyük kısmını Diyabetik Ayak gibi komplikasyon sonucu gelişen hastalıkların sebep olduğu ve kullanılması gereken özel ayakkabı ve çorap gibi eşyaların oluşturduğu görülmektedir.

Anahtar Sözcükler: *Tip 2 diyabet mellitus, Sağlık harcamaları, Hastalık maliyeti*

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DOI: 10.25048/tudod.956511

Received / *Geliş tarihi* : 23.06.2021
Revision / *Revizyon tarihi* : 25.10.2021
Accepted / *Kabul tarihi* : 02.12.2021

INTRODUCTION

Diabetes Mellitus (DM) is a chronic metabolism disorder emerging in case of deficiency of insulin, the hormone balancing the glucose amount in the blood, or as a result of the impossibility of its use in the body even if secreted in the sufficient amount (1).

Type 2 Diabetes is the type of Diabetes also referred to with the names like "non-insulin dependent Diabetes" and "adult Diabetes" previously, which is most prevalent and amounts to more than 90% of the Diabetes diagnosis cases. It is also the most prevalent metabolism disease seen in the adult individuals. However, although it is commonly regarded as an adult disease, it has an increasing prevalence also in the individuals at young ages recently. The cardiovascular case risk of the individuals who have been diagnosed with Type 2 Diabetes is 2-4 times higher compared to the individuals not diagnosed with Type 2 Diabetes (2-4). Number of Type 2 Diabetes patients has shown an increase of more than two folds over the last 2 decades. According to a study conducted by International Diabetes Federation(IDF) Atlas 8th and 9th edition (2017-2019), it is seen that there are a total of 415 million diagnosed Diabetes patients for 2015. According to the results of the same study, this number is anticipated to rise to 642 million in 2040 (5,6).

Affecting a broad mass, this disease results in substantial financial outcomes. The global cost of Diabetes was in the order of 500 billion USD in 2010 according to the data of the World Economic Forum (WEF), whereas this figure is anticipated to rise to the order of 745 billion USD in 2030. The amounts expressed consist of mainly the direct costs (7). According to WEF and WHO data, global health expenditure on diabetes was $760 billion in 2019 and is expected to reach $825 billion by 2030 and $845 billion by 2045. Most of the burden falls on middle- and low-income countries which are also seeing the greatest increase in cases (8).

According to the OECD data contained in the 5th Diabetes atlas, this cost is stated as $270 per person in the countries with middle- and low-income level and $5063 in the countries with high income level (5).

In a study conducted on 4.3 million patients diagnosed with Type 2 Diabetes in Turkey, total cost for Type 2 Diabetes patients is expressed as 11.366-12.859 billion TL. This figure corresponds to a share of 1%. The greatest share (24.3%-32.6%) in this amount including the indirect and direct cost items belong to the cardiovascular complications. Then, complications concerning the kidneys (25%-28.3%) and the simultaneous cardiovascular and hypertensive drug cost follow (9).

It is seen that the vast majority of previous studies are related to the medical aspect of Type 2 Diabetes Mellitus. In the studies carried out on cost, it is seen that the general cost is calculated and there is no cost study related to out-of-pocket payment. For these reasons, the main purpose of conducting the study is to calculate the out-of-pocket payment items and costs related to the disease in Type 2 Diabetes patients. One of the main reasons for conducting this study is that there are few studies conducted on the subject in Turkey and this deficiency is filled in the literature.

MATERIALS and METHODS

In this study conducted on the patients diagnosed with Type 2 Diabetes in a public health institution, it was aimed to calculate the out-of-pocket payment costs of the patients per patient and for the total central district population.

The study has a descriptive design and qualifies as a cost study. The study universe consisted of Type 2 Diabetes patients who applied to the Endocrinology and Metabolism Diseases policlinic of a university hospital located in the centrum of Konya province, and who are hospitalized in this service. Random sampling method was used among the non-probability method types in selection of the sample. Since there are no other studies conducted according to the same study method in Turkey, it is possible to determine the cost of patients with diabetes abroad from a study conducted earlier (10) a sample calculation was made using the obtained values. In a study conducted by Davari et al (2016), the cost of care for patients with diabetes was found to be 17.9±8.7$. According to these values, it was determined that 90 people and a total of 180 people should be taken for each patient group (outpatient and inpatient) in the calculation of the 5% alpha margin of error, small effect size (0.3) and the number of samples performed with 80% power.G-Power analysis with significance level of 0.05 was utilized for sample calculation. The corresponding values in the G Power program used for the calculation; $\mu 0$= 17.9, $\mu 1$=20.51, σ=8.7, α=0.05, β error=0.20 and d= 0.3.For the study, the participants were selected from the patients who applied until they reached the calculated number in the relevant time period.The researcher performed face-to-face interview with the 180 patients, the calculated number of samples, and their attendants, if any, during collection of the date, and each interview lasted 20-25 minutes. The interviews were performed by the researcher with the participant in the patient waiting room of the policlinic for the policlinic patients, whereas the interviews with the service patients were performed by the researcher in presence of the healthcare personnel. Also, the attendants were evaluated in the scope of the study since the patient

attendants could be included in the expenditures made and affect the out-of-payment cost concerning the disease.

"Applied to the institution between the dates when the study was conducted", "18 years and older", "the attendant, if any, is also willing to participate in the study with the patient", "Type 2 Diabetes patients willing to participate in the study, whose informed and oral consent is taken" were considered as the criteria for inclusion in the study, whereas the exclusion criteria were set as "Diabetes patients included in the group of the ones other than Type 2 Diabetes patients" and "Patients younger than 18 years".

A questionnaire was utilized as data collection tool. Two different questionnaires were created and applied making use of the experts, physicians and academicians for two different patient groups (policlinic and service). Both questionnaires contain the descriptive characteristics of the participants in the first section, their medical information in the second section, cost information in the third section, and the cost information related to the attendant in the last section. The questions contained in the sections vary due to the different payment items emerging during service or policlinic applications.

The study was carried out on patients who applied to a province and hospital in a certain period, and it should be supported with several regions and patients in order to generalize. This situation can be expressed as the most important limitation of the study.

The prevalence calculation formula to be used in the study is as follows:

Prevalence = Number of persons in whom a certain disease or condition is seen at a certain time / Number of the persons under risk at the same time x 10^n

The 2016 version of the Microsoft Excel package program was used for the transformation and calculations performed in the study.

The most important limitation of the conducted study is that it was conducted in a university hospital. In this reason, it is unlikely to be generalized to the whole of Turkey.Another important limitation can be expressed as the fact that participants are not covered by a special health insurance. Considering the increasing popularity of private health insurance, it is possible to express this as a limitation.

The ethics committee permits dated 26.05.2017 and no. 2017/971, and the institution permit dated 09.06.2017 and no. 900-E.7979, which were required for the study, interviews were performed with the patients and the study was completed. The study has been carried out in accordance with the Helsinki Declaration Principles.

RESULTS

The results concerning the descriptive characteristics of the Type 2 Diabetes patients and cost items and amounts of the policlinic and service patients related to Type 2 Diabetes disease are given in this section.

Accordingly, Table 1, 57.7% of the policlinic patients were male and 42.3% were female participants. Service patients are seen to consist of males by 25.5% and females by 74.5% in terms of the gender variable. In distribution of all patients included in the application in terms of the gender variable, the males were determined as 41.6% and females as 58.4%.

In income status distribution, mean age of policlinic patients was seen as TL 2783, whereas this was calculated as TL 2437 for service patients. Income status of the patients is seen to be TL 2610 for overall participation.

In terms of employment status, the distribution took place as 42.7% employed, 27.2% unemployed and 30.1% as retired. In educational status distribution, which indirectly influences increase of the health literacy and the awareness of the disease, the distribution is seen to appear as 13.3% illiterate, 27.2% primary school, 36.1% high school, 18.3% university and 5.1% postgraduate.It is seen that all the participants in the study were covered by General Health Insurance and were not included in a private health insurance.

Table 2 below contains the data about the numbers of total individuals and Diabetic individuals in Konya for 2017.

The purpose in obtaining these data is to enable calculation of the Diabetes prevalence by males and females in the central districts of Konya. Since the figure related to the number of Diabetes patients as obtained from Konya Provincial Directorate of Health covers the entire of Konya and the number of patients grouped by districts could not be obtained, prevalence calculation will be performed based on the central district population and it will be proportioned again later according to TURKSTAT's central district population data. The following prevalence calculation formula was used for calculation of the prevalence values of male and female groups. Accordingly, prevalence was determined as 6.78 in males and 10.64% in females according to the data of Provincial Directorate of Health and TURKSTAT.

Distribution of male and female groups by central district populations as obtained from TURKSTAT (2017) (11):

The most crowded total population including males and females is seen to be in Selçuklu with 639450. This population consists of the female population of 325469 and male population of 313981. It is followed by Meram with 345813 people (171896 male; 173917 female) and the

central district Karatay with 315959 people (158906 male; 157053 female). The central population of Konya is seen to be 1301222 people. According to the prevalence rates calculated in Table 2, estimated Diabetes patient numbers in the central districts are seen to be 43716 for males and 69845 for females.

The study conducted is evaluated based on the separate questionnaires of policlinic and service patients. However, the number of patients calculated refers to the general total of both. Therefore, the data related to the policlinic and service patients who have applied to the hospital of the study during one year (2017) were requested, and the overall number related to the disease was obtained without breach of patient privacy and confidentiality.

The data related to the policlinic and service patients who have applied to the hospital of the study during one year (2017):

- Policlinic patience: 60974
- Service patience: 6402

In line with the data obtained from Konya Provincial Directorate of Health, among a total of 67376 patients who have applied to the hospital in relation with the disease during one year (2017), 60974 are seen to have received policlinic service and 6402 are seen to have received service service. Namely, 90.5% of the patients have received policlinic service and 9.5% service service. According to these results, it is seen that 39563 have received policlinic

Table 1: Information on demographic information of type 2 diabetes patients.

Features	Service Patience Inpatience	Policlinic Outpatience	Total (Inpatience and Outpatience)
Gender, n(%)			
Man	52 (29.0)	23 (13.0)	75
Woman	38 (21.0)	67 (37.0)	105
Mean Age	61.6	60	
Marital Status, n(%)			
Married	69 (38.0)	75 (42.0)	144
Single	21 (12.0)	15 (8.0)	36
Employment Status, n(%)			
Working	59 (33.0)	24 (13.0)	77
Not working	9 (5.0)	44 (25.0)	49
Retired	22 (12.0)	22 (12.0)	54
Number of Child	3.26	3.95	
Income Status	2783 TL	2437 TL	
Educational Status, n(%)			
Illiterate	9 (5.0)	15 (8.0)	24
Primary School	16 (9.0)	33 (18.0)	49
High School	38 (21.0)	27 (15.0)	65
University	21 (12.0)	12 (7.0)	33
Graduate(MD; PhD)	6 (3.0)	3 (2.0)	9
Type of Health Insurance, (n)			
General Health Insurance	90	90	180
Private Health Insurance	0	0	0

Table 2: Information on population of Konya, number of people with living diabetes and prevalence.

	Population of Konya	Number of People with Living Diabetes*	Prevalence (%)
Man	914457	62033	6.78
Woman	937893	99838	10.64
Total	1852350	16187	8.73

* This information obtaining from Turkish Statistical Institution (TURKSTAT) and Konya Provincial Directorate of Health

service and 4153 have received service service among the males, whereas 63210 have received policlinic service and 6635 have received service service among the females. These figures will be used later following the calculation of average cost per patient for policlinic and service patients.

Table 3 below contains the items and results concerning the out-of-pocket payment costs incurred by policlinic patients, who are named also as outpatients, and their attendants.

According to Table 3, considering that the patients receiving policlinic service receive this service for once during one-year, average cost per patient was calculated as TL 1,046.26.

When the TL 1,046.26 obtained as the average cost amount per patient was reconsidered according to the percentage (90.5%) of the patients receiving policlinic service, the out-of-pocket payment cost results for the policlinic patients contained in Table 4 were obtained. Accordingly;

The out-of-pocket payment cost for a total of 39563 male patients receiving policlinic service is seen to be TL 41,393,184 for 2017 according to the data of Table 4. For females, out-of-pocket cost of a total of 63210 patients was calculated as TL 66,134,094. Namely, a total of 102773 patients receiving policlinic service have incurred an out-of-pocket payment cost of TL 107,527,278 in total during one year.

Following the policlinic patients, the data related to the expenditure items and costs pertaining to the service patients are presented in Table 5.

The expenditure items indicated in Table 5 are different from those of policlinic patients for the purpose of determination of the expenditures made by the patients only throughout their hospitalization. The expenditure items like "Per person cost of the instruments, etc. tools used by the patient for Diabetes" and "Per person cost of nutrient foods consumed for Diabetes (for fasting, diet, etc.)", which are in question for policlinic patients and which have an important share in also in terms of cost per patient, were not included due to the abovementioned reason.

Table 6 contains the data related to the out-of-pocket health payments made on male and female basis for service patients according to the data of Table 5.

The rate of the number of policlinic and hospitalized service patients calculated before is seen to be 9.5%. Table 4 contains the numbers of Diabetes patients living in Konya central districts. Accordingly, having recalculated the numbers

Table 3: Findings on expenditure items made by policlinic patients and average out of pocket payment cost*.

Cost Per Person of Diabetes-Related Disease	340 TL
The Cost Per Person of The Tools Used by The Patient Related to Diabetes	93.30 TL
Cost Per Capita Food Related to Diabetes (Nutrition, diet vs.)	445.30 TL
Cost Per Capita Meal Eaten in Hospital	59 TL
Cost Per Person Go to Hospital	41.60 TL
Cost Per Person of Other Expenses During Hospital Period	31.46 TL
Cost Per Capita For Companion	20.60 TL
Cost Per Capita Other Expenditure of The Companion	15 TL
Total	1,046.26 TL**

* The cost amounts related to the expenditure items mentioned in Table 3 were calculated on year basis.

** The amount calculated in Table 3 was calculated assuming that the patients received policlinic service for once during one year. (Since the patients received policlinic service four times in average during one year but this figure varied from one to seven, calculation was made for receipt of service for once.

Table 4: Total cost of male and female patients in polyclinic diabetes patients living in Konya central districts.

	Ethical Approval	Number of Policlinic Patients with Adapted Percentage *	Average Cost Per Patient	Total Cost
Man	43716	39563	1,046.26 TL	41,393,184 TL
Woman	69845	63210	1,046.26 TL	66,134,094 TL
Total	113561	102773	1,046.26 TL	**107,527,278 TL**

* In calculation of the number of policlinic patients with adapted percentage, the data related to the numbers of policlinic and service patients who have applied during 2017 to the hospital of the study were used.

Table 5: Expenditure items of service patients and findings regarding the cost of average cell payment*.

Cost Per Person of Diabetes-Related Disease	235 TL
Cost Per Person Go to Hospital	11.80 TL
Cost Per Person of Other Expenses During Hospital Period	46.20 TL
Cost Per Person Accompaniment Transportation	9.68 TL
Other Costs by the Companion During the Hospitalization	47.91 TL
Total	350.59 TL

* The cost amounts contained in this table were calculated taking into account the hospitalization of the patients for once during one year. The amounts may change by folds as a result of hospitalization of a patient for more than once.

Table 6: Total cost of service diabetes patients in male and female living in Konya central districts.

	Number of People with Living Diabetes	Number of Service Patients with Adapted Percentage	Average Cost Per Patient	Total Cost
Man	43716	4153	350.59 TL	1,456,000 TL
Woman	69845	6635	350.59 TL	2,326,165 TL
Total	113561	10788	350.59 TL	**3,782,165 TL**

of Diabetes patients living in the central districts with the rate of the service patients above, it is seen that 10788 hospitalizations have taken place among a total of 113561 patients. This number was calculated as 4153 for males and 6635 for females. With regard to out-of-pocket payment costs, it is seen that an out-of-pocket expenditure of TL 1,456,000 has been made by males and TL 2,326,165 by females, totaling to TL 3,782,165 during one year. However, it should be noted that this figure was calculated considering that the patients were hospitalized for once during one year. It is seen that a service patient was hospitalized for eight days in average. In the study conducted by Keskek et al. (2013), this period was expressed as 9.8±7.4 for males and 10.7±6.7 for females. In this context, it is possible to say that the results of the two studies support each other (12).

Accordingly, it has been calculated as TL 111,309,443, the sum of the TL 107,527,278, which is the out-of-pocket cost amount of the policlinic patients as contained in Table 4, and the TL 3,782,165, which is the total out-of-pocket cost amount of the service patients as contained in Table 6. This obtained figure expresses the out-of-pocket cost incurred by the Type 2 Diabetes patients present in Konya central districts during one year.

DISCUSSION

When examined the demographic characteristics of the study participants, it is seen that 41.6% were male and 58.4% were female. When examined the policlinic and service patients separately, 57.7% of the policlinic patients were male and 42.3% were female, whereas the distribution appeared as 25.5% male and 74.5% female for service patients. The reason why the gender variable showed such degree of difference in the two different groups of participants may be attributed to the fact that the patients acted cautiously or tentatively against the researcher. In receiving oral consent for the questionnaire to be applied to policlinic patients, the women were observed to be reluctant in participating in the study and felt apprehension.

When examined the participants in terms of mean age, it is seen that there is no difference between policlinic and service patients. According to the data of TKrHRF (2013) study, in the data of the Diabetic individuals, it seen that the prevalence of the individuals of the age group 45-54 was 15.5%, whereas the prevalence was 27% in the age group of 55-64 (13). This rate is seen to be one-digit in the age groups below the age group of 45-54. It can be expressed that the rates in the age groups above the age group of 55-64 years are similar to the rate of the age group of 55-64. Hence, it can be said that in general the individuals diagnosed with Diabetes showed a great increase in the age interval of 45-54, however, there was an increase in an advanced age group that is nearly two folds compared to the age group of 45-54. In the advanced age groups, this rate increases at levels similar to the age of 55-64. Another study supporting the abovementioned two studies is the one conducted by Keskek et al. (2013). In that study, mean age of the patients diagnosed with Type 2 Diabetes was stated to be 60.3, too (12).

When examined the data related to income status, mean income of the patients diagnosed with Type 2 Diabetes, who were included in the study, is seen to be TL 2610. This

figure includes not only the wage earned by the individuals in return for any job, but also the items like rental proceeds derived from the house(s) owned by them. This amount was calculated on month basis. If the annual income of the individuals included in the study is calculated on year basis so as to enable comparison according to the data of TURKSTAT (2016), the amount is calculated as TL 31.320, and the average of the TURKSTAT (2016) calculations for the annual equivalent household individual income is seen to be TL 19.139. In this context, it is possible to say that, in the hospital of the study, the participants had an annual income above the average (14).

In respect of the results related to out-of-pocket payment costs, it is seen for the policlinic patients that the item for which most payment is made during one year was the nutrients consumed for the Diabetes disease. These nutrients include the goods such as bran bread, whole wheat bread, kefir and walnut. The patients make an out-of-pocket payment of TL 445.30 in average annually for these nutrients. It is seen that this amount constitutes the majority of the average cost per patient calculated for service patients. When examined the results of the study on the additional cost of chronic renal failure in Type 2 Diabetes patients, conducted by McQueen et al. (2016) in the USA, the increase in total health expenditures of phase 3A, 3B and 4 patients is seen to be 1732 USD, 2632 USD and 6949 USD, respectively (15).

Mean out-of-pocket payment cost of policlinic patients was calculated as TL 1046.26 per person. Furthermore, the average cost of access to the hospital per patient was calculated as TL 41.60. In a study conducted in Pakistan, which included the policlinic patients from Diabetes patients, average direct cost per person was calculated as 11,580 Pakistan Rupees. This amount is expressed also as 197 USD. If calculated based on the fact that USD-Turkish Lira exchange rate was 1 USD = 8.05 TL as of 15.04.2021, this figure corresponds to TL 1,585.85. [Cost data related to the other studies conducted will be discussed on the basis of the date and exchange rate of 15.04.2021]. It is expressed that the most important share in the said direct cost consists of the drug expenses with 46%. The cost of access to the hospital is seen to be 119.70 Pakistan Rupees. This figure corresponds to approximately 1 USD (16).

For the patients who were hospitalized, the cost of expenditures made throughout their hospitalization was TL 46.20, whereas the cost of the expenditures made by the patient attendant throughout this period was calculated as TL 47.91. In respect of the attendants, it was expressed by the attendants that food and snacks eaten outside had an important share for some of them, and that the expenditures made for the persons coming for patient visit were an important factor in determining the amount of the expenditures for some. For Type 2 Diabetes patients, the cost of the special instruments and devices used for the disease and the drugs used by them was seen to be TL 93.30. In a study conducted in the USA, this cost was calculated as 144 USD per month for Type 2 Diabetes patients. Average drug expenses of the individuals who are not Diabetes patient was calculated as 118 USD. Namely, an average Type 2 Diabetes patient US citizen has to make an expenditure of 26 USD additionally for the expenses such as drugs, etc (17). In another study conducted by Bibeau et al. (2016), it is expressed that the costs of the drugs related to Diabetes was 65.99 USD. The ratio of this calculated amount to the annual household income was determined as 0.2% (18).

In a study conducted in Italy on the cost of the Type 2 Diabetes disease, it was expressed that monthly average cost for Type 2 Diabetes patients was 228.7 Euros (TL 2,206.95) [1 Euro = 9.65 Turkish Liras as of 15.04.2021], whereas monthly average cost for the individuals without Type 2 Diabetes disease was 169.9 Euros. Namely, the Type 2 Diabetes disease has imposed an additional cost of 58.8 Euros monthly to the individuals. Results of the same study for direct costs are as 199.2 Euros for Type 2 Diabetes patients and 129.1 Euros for individuals without Type 2 Diabetes disease (19).

The TL 1,046.26, which is the cost found for policlinic patients, was calculated considering applications of the patients for once during one year for receiving policlinic service. The fact that the patients have come twice or more times would increase the costs related to "the charge of access to the hospital" and "eating-drinking and other expenditures made at the hospital" to the extent of the application frequency, and would naturally increase the out-of-pocket payment cost. It was concluded in the study that the patients came four times in average during one year. In this context, an out-of-pocket payment cost of TL 4,185.04 would be calculated for a patient who comes four times to the hospital during one year. This corresponds to a figure like TL 349 on month basis. The mean income of the policlinic patients was calculated as TL 2783 in the study. In consequence of these results, an individual who is a policlinic patient spends 12.5% of his/her monthly salary for the expenditures related to the Diabetes disease. Considering for a patient hospitalized due to the Type 2 Diabetes disease that he/she is hospitalized for once during one year, with TL 350.59, the average cost per patient, of the TL 2437, the average monthly income of service patients, it seems likely that he/she spends approximately 15% of his/her total income as out-of-pocket payment cost throughout

the period of his/her hospitalization. However, this rate varies as a result of the variables like "the number of days the patient is not hospitalized, hospitalization of the patient twice or more times during one month".

When compared the results of the study conducted with the results of other studies; it is seen in comparison of the results related to out-of-pocket payment of the individuals who are Type 2 Diabetes patient in Turkey with other countries and worldwide that the health expenditures made are (6,16,20,21):

- too lower than the out-of-pocket payment cost incurred by an average US citizen or citizens of the countries included in high income group in both receipt of treatment service and special instruments and drugs used for the disease,
- similar to the direct costs incurred by a Pakistan citizen in one year in terms of policlinic service,
- partially similar also compared to an Iran citizen,
- similar compared to countries included in the low, middle and middle-high income group, which it is also included in, according to the OECD average.

The recommendations that can be given in regard to the subject matter are as follows:

For the institutions that carry out policy planning and implementation;

- Joint projects are conducted with the relevant institutions and activities are undertaken for reduction of the cost assumed by the patients;

For the institutions carrying out offering of goods and services;

- Support is provided to domestic production involving the special instruments and articles used by the patients, and reduction of out-of-pocket payment costs of the patients as a result of decreasing the costs of these

For other researchers who will study the subject in the future;

- The subject is studied with a broader universe and the results attained are more comprehensive.

Acknowledgement

None.

Authorship Contributions

Conception, Design Materials, Data Collection and/or Processing, Analysis and/or Interpretation, Literature Review, Writing: **Mustafa Kafes**, Conception, Design, Supervision, Critical Review: **Didem Kaya.**

Conflict of Interest

We have no conflict of interest to declare.

Financial Disclosure

No financial support was used for the study.

Ethical Approval

The ethics committee permits dated 26.05.2017 and no. 2017/971, and the institution permit dated 09.06.2017 and no. 900-E.7979, which were required for the study, interviews were performed with the patients and the study was completed. The study has been carried out in accordance with the Helsinki Declaration Principles.

Peer-Review Proces

Extremely peer-reviewed and accepted.

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