ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

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The Out of Pocket Cost of Outpatient Breast Cancer in Konya, Turkey

Ayaktan Tedavi Gören Meme Kanseri Hastalarının Cepten Harcama Maliyetleri Konya, Türkiye

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ABSTRACT Objective: Breast cancer is the most common type of cancer in women with increasing incidence and prevalence rates in the world and in our country, and it is inevitable that the costs associated with breast cancer create an economic burden for both states and patients. For this reason, in our study, it was aimed to determine the illness and disease-related out-of-pocket healthcare costs of patients receiving outpatient treatment due to breast cancer. **Material and Methods:** Our study, which is a quantitative study, also shows the feature of being a study in the field of health economics. The sample of the study consisted of 86 patients who receive outpatient treatment diagnosed with breast cancer (receiving chemotherapy and radiotherapy) in Necmettin Erbakan University Meram Medical Faculty Hospital. **Results:** According to the data obtained from Konya Provincial Health Directorate Public Health Presidency, there were 444 confirmed breast cancer patients in Konya, 434 of which are women and 10 of which are men inn 2016. In the study, one-year out-of-pocket spending of breast cancer patients was calculated as 5,616 TL. **Conclusion:** The overall cost of breast cancer patients in Konya in 2018 was calculated as 2,493,876.98 TL, this cost was 2,437,708.56 TL for female breast cancer patients and 56,168.4 TL for male breast cancer patients. A detailed examination of other cost items will be a guide for the costs of breast cancer patients and for reducing these costs.

Keywords: Breast neoplasms; health economics; health expenditures

ÖZET Amaç: Meme kanseri, dünyada ve ülkemizde artan insidans ve prevalans oranlarıyla kadınlarda en çok görülen kanser türüdür ve meme kanserine bağlı maliyetlerin, hem devletler hem de hastalar için ekonomik yük oluşturması kaçınılmazdır. Bu sebeple çalışmamızda, meme kanserine bağlı ayaktan tedavi gören hastaların, hastalık ve hastalıkla ilişkili cepten sağlık ödeme maliyetlerinin belirlenmesi amaçlanmıştır. **Gereç ve Yöntemler:** Nicel bir çalışma olan çalışmamız, aynı zamanda sağlık ekonomisi alanında bir çalışma olma özelliği de göstermektedir. Çalışmanın örneklemini Necmettin Erbakan Üniversitesi Meram Tıp Fakültesi Hastanesi'nde ayaktan tedavi gören (kemoterapi ve radyoterapi alan) meme kanseri tanısı almış 86 hasta oluşturmaktadır. **Bulgular:** Konya Valiliği İl Sağlık Müdürlüğü Halk Sağlığı Başkanlığından elde edilen verilere göre Konya ilinde, 2016 yılında 434 kadın ve 10 erkek olmak üzere toplamda 444 meme kanseri hastası bulunmaktadır. Yürütülen çalışmada meme kanseri hastalarının meme kanserine bağlı 1 yıllık cepten harcamaları 5.616 TL olarak hesaplanmıştır. **Sonuç:** Konya ili geneli 2018 yılı için ise meme kanseri hastalarının toplam maliyeti 2.493.876,98 TL, kadın meme kanseri hastaları için 2.437.708,56 TL ve erkek meme kanseri hastaları için ise 56.168,4 TL olarak hesaplanmıştır. Diğer maliyet kalemlerinin ayrıntılı incelenmesi, meme kanseri hastalarının maliyetleri ve bu maliyetlerin azaltılması konusunda yol gösterici olacaktır.

Anahtar Kelimeler: Meme kanseri; sağlık ekonomisi; sağlık masrafları

Cancer is a term defined by growth beyond normal limits by the spread of abnormal cells to adjacent parts of the body and/or other organs. Among all cancer types, breast cancer is the second most common cancer type in the world for both sexes, and the first in women. In terms of cancer-related deaths, breast cancer ranks fifth. According to the data of the World Health Organization (WHO), there are 2.09 million cases of breast cancer worldwide and there were 627,000 deaths due to breast cancer.

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Throughout life, a woman's risk of getting non-invasive breast cancer is 1 in 6, and the risk of getting invasive breast cancer is 1 in 8. This risk increases with age.[1] According to many studies conducted on women with breast cancer, reasons such as ethnic origins, changing lifestyles, and women of the same ethnic origin living in different regions are among the factors affecting breast cancer risk in women.[1,2] Throughout her life, the risk of a woman getting diagnosed with breast cancer is 12.6% if she is white and 10.2% if she is black. A woman who has not been diagnosed with breast cancer until the age of 60 has the risk of getting breast cancer diagnosis at the rate of 7.7% if she is black and 9.5% if she is white in the rest of her life.[3]

Breast cancer is one of the cancer types with high survival rate among all cancers.[4] There are many reasons for the increase in the prevalence of breast cancer such as women being more conscious about the disease, the development of imaging and diagnosis methods, and the progress in treatment methods.[5] While breast cancer survival rate is 12% for Africa, it is up to 90% for the United States (US), Canada and Australia, and the difference in rates results from the difference of countries' levels of development in connection with the combination of early diagnosis, access to treatment and cultural barriers.[6]

Breast cancer care costs are higher compared to lung cancer, which ranks first among cancers in the world.[4] This is because women with breast cancer have an expectation of at least 5 years to survive.[7] With the increase in survival rate, the number of patients with breast cancer, i.e. the prevalence of breast cancer, is increasing. As can be estimated from the increasing incidence and prevalence rates associated with breast cancer, breast cancer causes a significant economic burden worldwide. We can define the economic burden as the loss of resources and opportunities due to breast cancer.[8]

When we examine the economic burden of breast cancer, we see that patients and their relatives are exposed to high economic burdens due to many reasons such as the increase in insurance premiums due to high treatment costs, high medical costs, extra treatments due to the side effects of chemotherapy, increase in the absenteeism by working breast cancer patients due to the course of the disease and out-of-pocket expenses.[8-10] At this point, it is important what kind of policy countries follow. For example, while the US adopts insurance in health care, the adoption of the social state understanding in Turkey and that a large proportion of health spending is covered by the Social Security Administration cause a change in the rate of exposure to the economic burden for the patient.

It is seen that the economic burden is generally examined in terms of direct and indirect costs. Direct costs are medical expenses and days of absence from work as mentioned in some studies. Indirect costs are caused by costs such as transportation, medicines and meals, and a decrease in income and increase in spending due to resigning from work and, breast cancer related borrowing.

The incidence and prevalence of breast cancer in Turkey increased and accordingly, it is a fact that the breast cancer related economic burden also increased. It is a major deficiency in the literature that the studies in which the economic burden of breast cancer in Turkey is examined in terms of both direct and indirect costs are scarce. In order to eliminate this shortcoming in the field even a little, it is aimed in this study to determine the average costs of out-of-pocket expenses of breast cancer patients due to various reasons, which we will calculate with the model we will create at the project stage. The research aims to calculate the cost of out-of-pocket payments that breast cancer patients (outpatients) and accompanying accompaniers make during the time they receive treatment and outpatient service.

MATERIAL AND METHODS

This is an economic study. This research was approved by the Necmettin Erbakan University Meram Medical Faculty Drug and Non-medical Device Research Ethics Committee with the decision number 2018/1184 dated 09.02.2018. The research was carried out in the Oncology Department Chemotherapy Unit (Outpatient) and Radiation Oncology Department Radiotherapy Unit (Outpatient) in a university

hospital located in the city center of Konya. The research population consists of breast cancer patients receiving outpatient treatment in Medical Oncology and Radiation Oncology units in a university hospital in the city center of Konya. Between February and May 2018, breast cancer patients meeting the inclusion criteria were included in the study from the breast cancer patients who received chemotherapy and radiation therapy in the Medical Oncology Chemotherapy Unit and Radiation Oncology Radiotherapy Unit. Inpatient and male breast cancer patients were excluded. This research was conducted in accordance with the Declaration of Helsinki Principles and the patient participating in the study and her companion were informed about the research and verbal consent was obtained.

Since no other studies were performed according to the same study method in Turkey, the number of samples was calculated using the values obtained from a study conducted in India for the cost of patients with breast cancer. In the study conducted by Jain and Mukherje with 221 participants between April 2012 and March 2013, the indirect total cost of patients with breast cancer was calculated as 21594507.97 Indian Rupee (INR) (USD 397762.16 with the exchange rate of 31.03.2013) (TRY 720176.84_with the exchange rate of 29.03.2013). According to these values, in the calculation of sample size made with 5% alpha error margin, high effect (0.40) size and 95% power, it was determined with G*Power program that 42 people per each patient group (outpatient and inpatient) and 84 people in total should be taken. The surveys of the research were prepared by the authors and the Cronbach alpha coefficient was found as 0.65 using Microsoft Excel.[11]

Breast cancer patients who were admitted to the hospital determined between the dates of the study, who came to receive treatment from the Konya center and its districts, who were willing to participate in the study, whose hospital attendants, if any, volunteered to participate in the study and whose consent were received were included in the study. Cancer patients other than breast cancer patients and breast cancer patients who came to the hospital determined from other provinces were excluded from the study.

The questionnaire on socio-demographic characteristics consists of questions regarding gender, age, marital status, employment status, number of children, income status, educational status and type of health insurance for both groups. Regarding medical information, breast cancer stage and changes in the stage were asked. In addition, there are questions regarding the number of annual hospital visits for this disease, the metastasis of the disease, the metastasis area, the total annual cost of the disease (pharmacy drug cost, the cost of each trip for hospital visits), and the medications used for treatment. Regarding the cost information, the medication that the insurance does not cover, the related usage period and cost, the usage period and the cost of the foods consumed as a result of the disease were asked. There are questions about accommodation cost information if any, food eaten by the patient and her companion, cost information related to the patient's transportation to the hospital and other cost items specified by the patient, if any. The questions addressed to the companions included degree of relationship with the patient, income status, method and cost of transportation to hospital, accommodation cost if any, cost created by basic needs such as foods and other cost items specified by the companion and cost knowledge related to these. Microsoft Excel program was used to analyze the data and calculate the cost.

Cost data were collected annually. If the patient came to the hospital by his/her own vehicle, distance to the determined university hospital for provinces of Konya Metropolitan Municipality was determined by calculating the average of the farthest and closest distances using Google Maps for transportation cost.

In determining the cost of the road, LPG was calculated as 0.25 TL, diesel was 0.30 TL and gasoline was 0.50 TL, since we do not know the type of the vehicle for patients who provide transportation with their own vehicle to the university hospital determined. To determine an average cost of the road, the fuel prices were averaged and it was found to be 0.35 TL. Patients and companions who use public transportation vehicles such as buses and minibuses reported that the bus fare is 2.10 TL for 1 time and this fee is between 2.25-2.75 TL for the minibus. Public transportation fees were determined within

the framework of the figures specified by patients and accompanying persons using public transportation.

RESULTS

A total of 103 patients who received chemotherapy and/or radiation therapy were interviewed within the framework of the permissions obtained within the scope of the study. However, since 17 of the interviewed patients came from different provinces, they were excluded from the research.

FINDINGS RELATED TO DEMOGRAPHIC CHARACTERISTICS OF BREAST CANCER PATIENTS IN THE RESEARCH GROUP

Total 86 breast cancer patients participated in the study. The average age of breast cancer patients included in the study is 51.12. The marital status of the interviewed patients was determined as 84.88% married (n=73), 8.13% single (n=7) and 6.97% other (widow, widower) (n=6). According to the data collected from the interviewed patients, 8.13% (n=7) of 86 patients reported that they were working, 82.55% (n=71) were not working and 9.3% (n=8) were retired. The average number of children of the patients is 2.44 and the family average of income status is 2,245.93 TL.

When we looked at the educational status of 86 patients included in the study, it was reported that 8.13% (n=7) were illiterate, 12.79% (n=11) were literate, 50% (n=43) graduated from primary school, 3.48% (n=3) graduated from secondary school, 11.62% (n=10) graduated from high school and 13.95% (n=12) graduated from university.

All of the patients participating in the research are covered by General Health Insurance (GSS). However, one them which means 1.16% of had both GSS and private health insurance. Among the patients included in the research, there aren't any patients who have only private health insurance.

FINDINGS SHOWING THE GENERAL POPULATION OF KONYA PROVINCE AND THE NUMBER OF INDIVIDUALS WITH BREAST CANCER

In order to calculate the prevalence values of female and male gender groups, the prevalence was obtained by comparing the number of individuals with breast cancer in both groups to the total population of their categories. Accordingly, the prevalence rate of women with breast cancer was calculated as 39.90 (in one hundred thousand). The prevalence rate of male patients with breast cancer was calculated as 0.93 (in one hundred thousand). According to the total population, the total breast cancer prevalence rate was calculated as 20.54 (in one hundred thousand) (Table 1).

Within the scope of the research, 65% (n=56) of the patients whose data were collected and included in the research came from the center to the university hospital, where 35% (n=30) came from the surrounding districts.

According to 2016 data from Konya Governorship Provincial Health Directorate Public Health Department, the youngest age group is 20-24 years old in individuals with breast cancer. For this reason, Konya province population was taken from the age group of 20-24. In the research group, there are no patients in the 20-24 age group. According to the data received from Konya Governorship Provincial Health Directorate Public Health Department, the highest number of breast cancer in female patients is in the 45-49 age group with 67 patients. In male patients, the most common breast cancer cases are in the 55-59 age group with 4 patients. The lowest number of patients is in the 20-24 age group with 1 patient for female patients, while it is seen in 35-39, 50-54, 60-64 age groups with 1 patient each for male patients (Table 2).

In women with breast cancer, the 60-64 age group has the highest value with a prevalence rate of 130.69 per 100,000, and the lowest value is in the 20-24 age group with a prevalence rate of 1.10 per 100,000. The highest prevalence rate for male patients with breast cancer in Konya province in 2016

TABLE 1: Information on Konya city population, number of individuals with breast cancer and prevalence (2016).

	Konya city population*	Number of individuals with breast cancer**	Prevalance (in 100,000)
Female	1,087.672	434	39.90
Male	1,073.631	10	0.93
Total	2,161.303	444	20.54

*These data were obtained from the Turkey Statistical Institute (TUIK).
**These data were obtained from Konya Governorship Provincial Directorate of Health, Public Health Department.

TABLE 2: Konya province population by age, number of breast cancer patients by age and distribution of the research group by age.

	Konya province population*		Number of breast cancer patients**		Research group***
Age groups	Female	Male	Female	Male	Female
20-24	90,663	86,417	1	0	0
25-29	78,347	80,484	6	0	2
30-34	80,920	82,783	13	0	5
35-39	80,734	81,547	30	1	7
40-44	71,125	69,970	57	0	9
45-49	63,733	63,052	67	0	15
50-54	64,090	61,726	56	1	15
55-59	49,771	48,511	53	4	16
60-64	48,203	43,851	63	1	5
65-69	37,038	31,723	35	0	6
70-74	26,628	21,098	20	0	3
75-79	19,516	14,541	18	0	3
80-84	12,747	9,595	7	3	0
85+	8,909	4,829	6	0	0
Total	732,424	700,127	434	10	86

*These data were obtained from the TUIK.

**These data were obtained from Konya Governorship Provincial Directorate of Health, Public Health Department.

***These data were obtained from the research.

is 31.26 per 100,000, in the 80-84 age group. This rate is followed by the 55-59 age group with a prevalence rate of 8.24 per 100,000 (Figure 1).

Due to the absence of breast cancer patients under the age of 20 for both genders, we arranged the prevalence according to the population over the age of 20 and reviewed it in Table 3. According to the new situation, the prevalence rate in female breast cancer patients increased from 39.90 to 59.25 per 100,000. For male breast cancer patients, this rate increased from 0.93 to 1.42 per 100,000. This ratio has increased from 20.54 to 30.99 per 100,000 for both genders (Table 3).

FINDINGS RELATED TO THE MEDICAL DATA OF THE RESEARCH GROUP

First phase breast cancer has the lowest percentage with 8% (n=7) in the study group. Patients with second phase breast cancer constitute 23% (n=20) of the research group. Patients with third phase breast cancer make up 21% of the research group (n=18) and

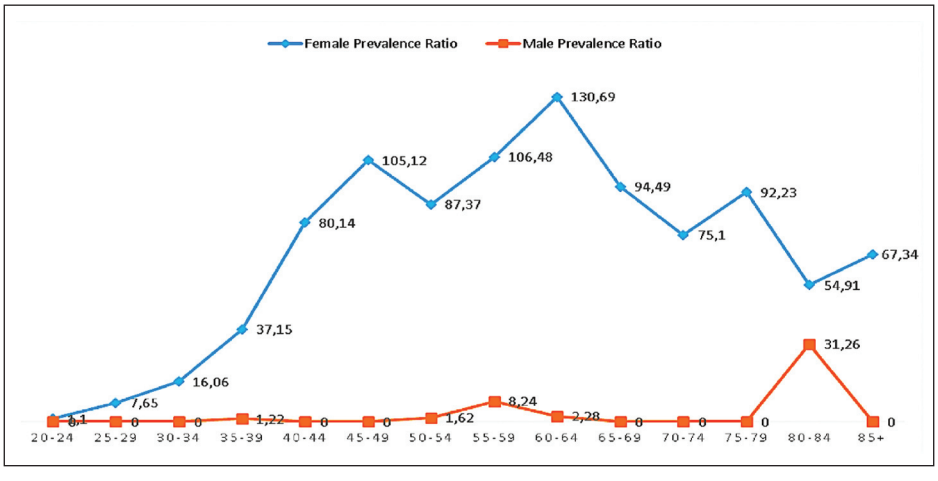

FIGURE 1: Breast cancer prevalence rate in Konya province by age and gender in 2016 (in 100,000).

*These data were obtained from the TUIK; **These data were obtained from Konya Governorship Provincial Directorate of Health, Public Health Department.

TABLE 3: Information arranged according to age for Konya province population above age of 20, number of individuals with breast cancer and prevalence (2016).

Konya province population above 20 years*		Number of individuals with breast cancer**	Prevalence (in one thousand)***
Female	732,424	434	59.25
Male	700,127	10	1.42
Total	1,432,551	444	30.99

*These data were obtained from the TUIK.
**These data were obtained from Konya Governorship Provincial Directorate of Health, Public Health Department.
***Since the breast cancer cases for Konya province started to be seen between the ages of 20-24, ages between 0-19 are not included in the table.

patients with fourth phase breast cancer make up 16% of the research group (n=14). However, 32% of the research group (n=27) consists of patients who do not know the phase of breast cancer and/or do not want to learn the phase. While 45% (n=39) of the study group had breast cancer metastases, 55% (n=47) did not have breast cancer metastases. According to the data of patients in the study group who reported that breast cancer had metastases, bone metastasis was the first with 36%, while liver metastasis was the second with 25%. Lung metastasis takes the third place with a rate of 12% (Table 4).

FINDINGS ON THE COST OF OUT-OF-POCKET PAYMENT OF BREAST CANCER PATIENTS (OUTPATIENT)

In Table 5, cost items of breast cancer patients and their companions examined in the research group are given. Patient medications and other costs are 1-year average costs calculated by figures obtained from the patients in face-to-face interviews. The scope of this cost item consists of the difference payments the patient pays to the pharmacy for the medicines used for breast cancer, extra fee the patient pays in each visit because the clinician treating him/her is an associate professor or a professor (The amount stated by the patients is 112 Turkish liras), payments of positron emission tomography (PET)/computed tomography scans made before their due time because it is necessary, application by the patient to emergency services or private hospitals due to the complications resulting from the treatment, the payment some patient made to their companions and income loss of working patients.

Patient and companion transportation costs were obtained from the patients interviewed. Since we do not know the vehicle type for patients who come to the university hospital with their own vehicle, LPG is worth 0.25 TL, diesel is 0.30 TL and gasoline is 0.50 TL. To determine an average road cost, average fuel prices were calculated and the average was found to be 0.35 TL. for bus, minibus etc. The patients and their relatives using public transportation reported that the bus fare for 1 departure was between 2.10 TL and between 2.25 and 2.75 TL for a minibus. Public transportation costs were determined within the framework of the figures given by the patients and their attendants. One-off cost is calculated separately for the patient and the attendant. Average one-off transportation cost is calculated by dividing the total reported cost by the total number of patients and companion. The total cost was obtained by multiplying the one-off cost by the number of visits to the hospital per year. One-time and annual patient and companion meal cost (for time spent in the hospital) is calculated as like the cost of transportation. One-off costs were calculated by taking the average of the meal costs reported by the patients and attendants participating in the survey. The total cost was obtained by multiplying the one-off cost by the number of visits to the hospital per year.

Since 83% of the research group examined is non-working (housewife), participants did not declare

TABLE 4: Findings related to the medical data of the research group.

Research question	Number of patients	Total
Breast cancer stage		
I. phase	7	86
II. phase	20	
III. phase	18	
IV. phase	14	
Unknown	27	
Metastasis status		
Have metastasis	39	86
No metastasis	47	
How many zones to the patient's cancer metastasized		
Metastasis to single zone	18	39
Metastasis to two zones	15	
Metastasis to three zones	3	
Metastasis to four zones	3	

TABLE 5: One-time costs, 1-year costs and percentage values of breast cancer patients (outpatient) receiving chemotherapy and radiotherapy and companions.

	Annual hospital visits	One time cost	Annual	%
Patient medicine and other costs		2,918.6	2,918.6	51.96
Patient transportation cost	34	23.93	813.62	14.48
Patient food cost (for time spent in the hospital)	34	15.47	525.98	9.36
Companion transportation cost	34	24.49	832.66	14.82
Companion food cost (for time spent in the hospital)	34	15.47	525.98	9.36
Total		2,997.96	5,616.84	100

*Costs are calculated in Turkish liras.

an expense loss of income due to incapacity to work. For this reason, we didn't calculate about this issue for the study. The number of patients reporting the losses in income is low. This is one of the factors that reduces the cost. As for the differences paid to the pharmacy, it is one of the reasons that 9% of the research group is retired and they do not have a clear information about the medicine difference paid to the pharmacy due to the deduction of the medication and examination differences from their pensions. Patient medicines and other costs constitute the highest cost item with a rate of 52%.

Patient transportation cost, which is another cost item, constitutes 15% of the total cost. Another cost item for the patient is the meal cost for time spent in the hospital of the patient. Patient meal cost also constitutes 9% of the total cost. The companion's transportation cost is 15% of the total cost and the companion's meal cost for time spent in the hospital is 9% of the total cost (Table 6).

According to the data obtained from the research group consisting of 86 breast cancer patients undergoing chemotherapy and radiotherapy, in the total cost of breast cancer patients medicine and other costs have the highest value with 2,997.96 TL and 52% of the patients. Together with the one-year figures of food and transportation costs, the total cost of 1 year was calculated as 5,616.84 TL.

According to the research, the one-year breast cancer cost of the breast cancer patient (outpatient) who received chemotherapy and/or radiotherapy was calculated as 5,616,84 TL. Total cost of patients with breast cancer in Konya province for 2016 has been calculated as 2,437,708.56 TL for female patients and 56,168.4 TL for male patients. The total cost was calculated as 2,493,876.96 TL. For Konya province, male patients account for 2% of the total cost of breast cancer patients. Female patients make up 98% of the total cost.

DISCUSSION

In patients diagnosed with breast cancer, methods such as surgical intervention, chemotherapy and radiation therapy are applied. Especially in patients who underwent surgical operations, the psychological trauma due to mastectomy and following adverse effects in various combinations due to chemotherapy and/or radiotherapy affect the quality of life of the patient negatively. The withdrawal from social life is another point that affects the quality of life of the patient, especially due to the fact that patients who receive chemotherapy and/or ra-

TABLE 6: One year total cost and total cost of breast cancer patients (outpatient) receiving chemotherapy and radiotherapy by gender in Konya Province (2018).

Gender	Number of Breast Cancer Patients *	1 Year Cost for 1 Patient	Total Cost
Female	434	5,616.84	2,437,708.56
Male	10	5,616.84	56,168.4
Total	444		2,493,876.96

* These data were obtained from Konya Governorship Provincial Directorate of Health, Public Health Department.

diotherapy have low body immunity during this process and working patients withdraw from work life as they are unable to work during the treatment process. In addition to withdrawing from this social life experienced by breast cancer patients, there are also financial losses. Despite the fact that social security institutions came together within the scope of Transformation in Health Program in our country and the treatment expenses are covered by state within the scope of General Health Insurance to which full participation was achieved in 2012, there are various items affecting out-of- pocket expenses of patients other than treatment costs. Transportation, food and accommodation costs due to breast cancer are some examples. Income loss of especially working patients due to incapacity to work, costs resulting from the disease for which the survival expectation is at least 5 years, costs resulting from adverse effects in patients who receive chemotherapy and/or radiotherapy (hospitalization due to the severity of treatment, application to emergency service etc.), bearing the costs of PET scanning by the patient and/or companion because it is repeated more frequently than it is planned during the treatment also affect the income-expense balance and quality of life of the patient negatively.

In the study conducted by Özmen in 2013, it was found that the average age of women diagnosed with breast cancer was 51.6, and this rate reached the maximum level in the 45-49 age group with a value of 16.7%. In Cancer Statistics 2015 (2018) published by the General Directorate of Public Health of the Ministry of Health, it was given that 44.5% of women diagnosed with breast cancer were in the 50-69 age range and 40.6% were in the 25-49 age range. In the research conducted, the age-related data are similar to both Özmen's work and the Cancer Statistics data published in 2015 by the Ministry of Health, General Directorate of Public Health.[12,13]

In studies in which breast cancer is examined in terms of cost, it is seen that costs are analyzed in two different categories as medical and non-medical costs. It is seen that medical costs are examined regardless of whether they are covered by the state or the individual. Non-medical costs are examined in terms of many different items.

When examined in terms of breast cancer, the fact that 44.5% of the patients were in 50-59 age group and 40.6% were in 24-49 age group according to Cancer Statistics of 2015 published by Public Health General Directorate of the Ministry of Health increases the likelihood that a vast majority of the participants were married. In addition it is an predictable fact that many of the patients with breast cancer diagnosis may be married because, although not certain, the possibility of breast cancer to emerge is higher especially in middle age and advanced age groups.[13]

In the study conducted by Daroudi et al. for 2010, it was concluded that the total transportation cost of 49,316 breast cancer cases was $ 21,606,293. Based on the data obtained from the article, the average value of 438.12 $ (660 TL, Dollars/Turkish lira exchange rate for 2010) per patient is 47% lower than the cost of transportation for a year of breast cancer patient compared to our study. The reason for this is that in our study, the number of visits to the hospital is assumed to be 34 times a year, and in the article examined, this figure is assumed to be an average of 15 times (based on the data given in the article) and therefore it is considered that a high rate of difference occurred.[14]

In their study in India, Jain and Mukherje divided indirect costs into four items as patient pay loss, companion pay loss, productivity loss and borrowing. They discussed the transportation, food and accommodation expenses as an item in direct costs. They calculated the 1-year meal, transportation and accommodation costs of breast cancer patients as 3,558,980 INR. This figure was realized as 16,103.98 INR per patient according to the data given in the article. In other words, it was realized as 537.87 TL (calculated on the basis of INR-TL rate dated 25.03.2013). The high cost difference between this study made in India and our study can be caused by many reasons such as the difference between inflation rates and the difference in living standards.[11]

In the study conducted by Vyas et al. in the USA, it was concluded that the costs of breast cancer patients receiving outpatient treatment were $ 6,447 for 2003 and $ 8,730 for 2009. Barron, Quimbo, Nikam, and Amonka determined the cost of applications for

patients with breast cancer in the US, including hospitalization once a month per patient, pharmacotherapy, and surgical intervention as $ 2,869. Costs per patient once a month were determined as $ 4,421 per case and $ 3,352 for patients without cancer. Jagsi et al. in the USA concluded that the out-of-pocket costs of breast cancer patients were $ 2,000 ($ 2,603.02/2007 Dollar rate). Kim et al. reported indirect costs of breast cancer for Korea in 2010 as $ 465.70 million (USD) and the 2010 breast cancer population as 77,809. In this case, the indirect annual cost per patient for Korea in 2010 was $ 5,985 (8,980 TL according to the 2010 US Dollar rate). Pisu, Azuero, Benz, McNees and Meneses reported in their study in USA that monthly out-of-pocket expenditures of rural breast cancer patients were $ 232.7 (2015 USD) ($ 2,792.4 per year=7,596 TRY). Especially in studies conducted in the USA, we see that the costs of breast cancer patients differ compared to our country. In this case, the health policies implemented are effective. Health policies implemented in the United States differ from Turkey's health policy. It is known that the private health insurance sector has developed in the USA and it has been stated in the studies that the costs of the private health insurance are included in the costs. In this study, since only 1 of the participants had private health insurance, we cannot say that the premium payments of the private health insurance are effective in the cost we reported.[15-19]

CONCLUSION

When the demographic characteristics of the participants of the study are examined, it is seen that 100% of the participants are women. This is because the risk of breast cancer is 100 times higher in women than in men due to genetic factors, and it is less common in men than women.

It was observed that the majority of the research group was housewives. The fact that 74% of the research group consists of less than high school graduates, that is, those who are illiterate, who are literate, and who are at the level of primary and secondary education, explains the low level of the working population. Retired participants were observed to retire due to disability and father or spouse death.

Household income data were collected from the participants, as the majority of the research group was not working (83%). The average household income of the breast cancer patients participating in the study was calculated as 2,245.93 TL monthly. These data cover not only household income, but also extra income from real estate owned by them. According to the data obtained, the annual average household income of the participants was calculated as 26,951.16 TL. According to the Income and Living Conditions Survey 2016 published by TUIK, the average annual equivalent household disposable individual income is 19,139 TL (http://www.tuik.gov.tr). According to these data, the patients participating in the research have a higher household income than TUIK data. According to the data calculated according to TUIK data, the annual household income of the research group is 40% higher.

When the education level of the participants was examined, it was observed that the patients who received high school and undergraduate education knew more about the course of the disease and the cost. Based on the literacy rate, a positive opinion can be made that the majority of the participants have high health literacy. However, it was also found that some patients did not want to obtain detailed information about the disease regardless of their level of education. The participants stated the reason for this situation as that breast cancer and developments about the disease negatively affect their psychology and they do not want to be affected badly.

All of the participants in the research are covered by GSS. Only 1 of these patients has both GSS and private health insurance. It is believed that the general reason why the participants do not prefer private health insurance despite the high household income is that the GSS covers almost the entire population.

It was concluded that the majority of the participants, with a rate of 32%, did not have any information about the stage of breast cancer. It was reported that 8% of the remaining participants had first-stage breast cancer, 23% had second-stage breast cancer, 21% had third-stage breast cancer, and 16% had a fourth-stage breast cancer diagnosis, 45% of the par-

ticipants reported that breast cancer metastasized. When the zones where breast cancer metastasized were examined, according to the data obtained from the participants, bona metastasis, liver metastasis and lung metastasis were the three most common metastasis regions. Breast cancer metastasis, which can occur even years later, mostly metastasizes to the bone, lung and liver regions. In this respect, it is seen that in most of the participants who stated that breast cancer metastasized, it metastasized to the areas known to open to metastasis as Badak's study states the most (bone, lung and liver).[20]

Medicine and other costs cover the highest out-of-pocket expenditure of breast cancer patients with a rate of 52%. In the study, total transportation cost (patient+companion) constitutes 30% of out-of-pocket expenses. It is known that the participants provide their transportation to the hospital by public transportation vehicles (such as minibuses, buses, trams) or by their own vehicles. It was observed that the road expenses decreased due to the reasons that some of the surrounding district municipalities provided transportation by free shuttle, and half the road expenses of the patients coming from the surrounding districts were covered by the state.

According to the data obtained from the participants, the annual food costs (for time spent in the hospital) constitute 18% of total out-of-pocket expenses of breast cancer patients. When all these cost items are combined, the total annual cost of breast cancer patients is calculated as 5,616.84 TL.

As a result of the research, out-of-pocket expenditures of total breast cancer patients in Konya were calculated as 2,493,876.96 TL for 2016. Out-of-pocket expenses of women breast cancer patients constitute 98% of total expenditure. Out-of-pocket spending of male breast cancer patients accounts for 2% of total spending. The reason for this gender-related difference between female and male breast cancer patients in breast cancer related out-of-pocket expenses is that breast cancer is more likely to occur in women genetically.

Regarding the results of the studies carried out, we cannot make comparisons as there is no research in this field in Turkey yet. However, when we compare it with the studies conducted in other countries, it is seen that there are differences. In studies abroad, items such as economic burden due to breast cancer-related mortality and morbidity, inability to work due to breast cancer and/or hours missing from work and disability adjusted life years were also included. It is not correct to make a comparison on indirect costs directly, as the work carried out is limited in this regard. Considering the studies examined, 1-year out-of-pocket spending due to breast cancer is higher than India and lower than the USA and South Korea. This is due to factors such as living conditions of countries, different national income per capita, low or high inflation rates of countries, and development levels.

LIMITATIONS OF THE STUDY

The limitations of the study were that it was limited to the breast cancer patients receiving chemotherapy and radiotherapy only and it didn't generalize the public, questionnaires couldn't be applied to the companions of the patients included in the study as they were in different areas, 2016 data were used while creating an economic model as a result of the study because data belonging to 2017 weren't prepared by Konya Governorship Provincial Directorate of Health Public Health and data were limited to those obtained by the questionnaire form. The study was conducted only on patients receiving chemotherapy and/or radiotherapy. The study only covers patients in the treatment process (breast cancer patients receiving chemotherapy and/or radiotherapy) since the service patient with breast cancer was not found at the time of collection of the data in the relevant clinic of the university hospital where the study was conducted and the application of questionnaire in the policlinic of related unit was not allowed by the department heads.

SUGGESTIONS

As in the world, the incidence and prevalence of breast cancer is increasing in our country. However, the absence of studies examining the economic burden of breast cancer in our country creates a deficiency in the literature in this field. In order to eliminate this deficiency, we suggest that studies be made in which;

■ Economic burden due to breast cancer mortality and morbidity is examined,

■ The economic burden of time missing from work caused by breast cancer is examined,

■ Breast cancer disability adjusted life years are examined.

Apart from these, it was mentioned that transportation costs have been reduced due to the fact that some of the participants in the research group have been provided with municipal services for transportation. It is thought that especially the surrounding districts of the provinces providing free service to cancer patients will help to decrease the cost of transportation related to the disease. In addition, some participants from the surrounding districts reported that half of the travel costs were paid by the state when they came by referral. This is another reason that reduces the cost of transportation. Increasing this rate is also thought to decrease the transportation cost of cancer patients and is therefore recommended for decreasing the transportation cost for cancer patients.

Source of Finance

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Sümeyra Temurtaş, Nimetcan Mehmet;* ***Design:*** *Sümeyra Temurtaş, Nimetcan Mehmet;* ***Control/Supervision:*** *Aydan Yüceler, Nimetcan Mehmet;* ***Data Collection and/or Processing:*** *Sümeyra Temurtaş;* ***Analysis and/or Interpretation:*** *Aydan Yüceler, Sümeyra Temurtaş, Nimetcan Mehmet;* ***Literature Review:*** *Sümeyra Temurtaş;* ***Writing the Article:*** *Sümeyra Temurtaş;* ***Critical Review:*** *Aydan Yüceler, Nimetcan Mehmet.*

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