RESEARCH ARTICLE

Evaluating Direct Costs of Gastric Cancer Treatment in Iran - Case Study in Kerman City in 2015

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Abstract

Background: Gastrointestinal cancers are common malignancies associated with high mortality rates. Healthcare systems are always faced with high costs of treatment of gastrointestinal cancers including stomach cancer. Identification and prioritization of these costs can help determine economic burden and then improve of health planning by policy-makers. This study was performed in 2015 in Kerman City aimed at estimating the direct hospital costs for patients with gastric cancer. **Materials and Methods:** In this cross-sectional study, the medical records of 160 patients with stomach cancer admitted from 2011 to 2014 to Shafa Hospital were examined, the current stage of the disease and the patients' health status were identified, and the direct costs related to the type of treatment in the public and private sectors were calculated. SPSS-19 was used for statistical analysis of the data. **Results:** Of the patients studied, 103 (65%) were men and 57 (35%) were women. The mean age of patients was 65 years. Distribution into four stages of the disease was 5%, 20%, 30%, and 45%, respectively. Direct costs in four stages of the disease were calculated as 2191.07, 2642.93, 2877, and 2674.07 USD (63,045,879, 76,047,934, 82,783,019, and 76,943,800 IRR), respectively. The highest percentage of costs was related to surgery in Stage I and to medication in Stages II, III, and IV. According to the results of direct costs of treatment for stomach cancer in Kerman, the mean total cost of treating a patient in the public sector was estimated at 74,705,158 IRR, of which averages of 60,141,384 IRR and 14,563,774 IRR were the shares of insurance and patients, respectively. **Conclusions:** The high prevalence and diagnosis of disease in old age and at advanced stages of disease impose great costs on the patients and the health system. Early diagnosis through screening and selecting an appropriate treatment method might largely ameliorate the economic burden of the disease.

Keywords: Gastric cancer - costs evaluation - direct costs - screening - Iran

Introduction

Gastric cancer is the fourth most common cancer and the second cause of cancer death throughout the world (Malekzadeh et al., 2009). It has a high incidence in countries like Japan, China, South America, and Eastern Europe (Somi et al., 2010). Gastric cancer is accounting for 8% of cancer incidence and 10% of cancer deaths (Lin et al., 2015).The highest rate was seen in Eastern Asia; so that its incidence was 35 in one thousand people in China and Japan, and 5 in one thousand people in the US (Nyren et al., 2006). According to the latest statistics of the World Health Organization, stomach cancer constitutes 10.4% of the main causes of death, and around 930 thousand people in the world are diagnosed as new cases (Parkin et al., 2005) of which 22 thousand cases are in the United States (Abeloff., 2000).

Despite a significant decline of stomach cancer in Europe such as Spain and Italy, it has an increasing trend in most developing countries such as Korea, Iran, and Portugal (Nourozinia et al., 2013). So that 50% of the most common cancers in Iran are related to GI tract (Amani et al., 2012). Stomach cancer is the first common cancer in men and the third in women (Kashani et al., 2010). According to national reports, stomach cancer constitutes 14% of all cancers in men (Roshanaei et al., 2010). The disease prevalence usually starts from the fourth decade of life with the highest prevalence in the seventh decade for men (Roshanaei et al., 2012). In addition, men are three times more likely to develop cancer of the gastrointestinal tract than women (Amani et al., 2012). Being asymptomatic at early stages and diagnosis of the disease at advanced stages not only is associated with an increased risk of mortality, but also imposes a lot of medical expenses to patients (Leung et al., 2008).

Given the growing trend of technologies and change in life style and expectations of people from health system, the costs of the healthcare system are increasingly augmenting (Gtzen., 2009). It is while developed countries are not able to provide health services due to their limited

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financial resources (Imani et al., 2014). Therefore, managers and planners of the field in any country should try to use the available resources to provide healthcare to their community based on scientific methods (Gtzen, 2009). Early estimation of the costs of care for cancer patients is an important component of national plans and policies of cancer (Yabroff et al., 2008). The aim of studies which evaluate the costs of a disease is to identify and estimate the costs of a particular disease, including direct, indirect, and intangible costs (Akbarzadeh et al., 2008). The direct costs are divided into two groups of treatment and non-treatment direct costs. Direct costs include the resources used for treatment by care provider sector; for example, time spent by healthcare providers, medicines, equipment, diagnostic tests, and operational requirements for any surgery. Direct non-medical costs are associated with various services received by patients, but are considered as non-medical costs in nature such as travel and accommodation (Shepard et al., 2000). Indirect costs include those resulted from not involving in production, absence from work, and reduced productive forces due to death or disability (Fakhrzadeh et al., 2000). Creation of some activities as a result of remedial measures, including discrimination at work and getting a job, is considered as intangible costs (WHO, 2003).

Costs associated with cancer care are classified in different ways, and direct treatment costs being the most famous. They include the costs created by health centers (hospitals and outpatient clinics), personnel (doctors, nurses, and other specialists), medical services, alternative and complementary care, and any medications. Both the patient and the health sector can bear the direct costs of healthcare (Bazyar et al., 2012). Costs bio-analysis is of great importance in terms of responsibility and accountability of health centers managers for the costs and spent resources, measurement of performance, evaluation of program priorities, prediction of future expenditures, analysis of relationship between current costs and capital expenditures, costs attention, and change in investment patterns (Davari et al., 2013). In publicly-funded healthcare systems, the importance of problems is measured by their frequency, overall mortality rate, and total costs, and based on these factors, managers allocate budgets and resources and make decisions (Davari et al., 2014).

Since stomach cancer is among the most common cancers in Iran and is the most common cancer in men, as 21 in 10 thousand patients are suffering from gastric cancer (Amani et al., 2012), estimation of the treatment costs of patients with stomach cancer can affect policy making in the government, the treatment of these patients, insurance organizations, and coverage of insurance services, and ultimately can improve patients' access to health services and overall improvement of health in the community. In this regard, the present study mainly aims to assess the direct costs of stomach cancer treatment in Shafa Hospital in Kerman.

Materials and Methods

In this cross-sectional study, 160 medical records of patients with stomach cancer, who were admitted to Shafa Hospital in Kerman from March 2011 to March 2014, were investigated. The samples were selected through attendance in Shafa Hospital and mining the detailed hospitalization costs of patients from the admission forms. The costs were calculated and estimated based on the payer's perspective. To this end, the total costs incurred by the patients, insurance organizations, and the health system were calculated. Given that only the direct costs of the disease can be calculated from patients' file, only the direct costs of the disease was addressed in this study. The direct costs include those associated with treatment such as doctor's visit, medication, chemotherapy, radiation therapy, diagnostic tests, treatment, radiology, and surgery.

Inclusion criteria were admission from 2011 to 2014, complete medical records, and regular and scheduled visits of patients. Medical records of patients were reviewed to determine the stage of disease, the treatment protocol, and the direct medical costs of services provided, such as the costs of doctor's visits, diagnostic tests, radiology, chemotherapy drugs, supportive medications, radiation therapy, surgery, and nursing. Due to the lack of information in the medical records regarding outpatient drug costs, the usual treatment protocol was determined based on the literature and confirmation by the specialist according to the 2015 tariffs. In order to remove the effect of inflation and price changes, to reduce errors, and to provide applicable results, all costs were calculated based on both public and private tariffs offered by the Ministry of Health and Medical Education in 2015. The costs for treatment in the private sector were estimated according to the official costs declared by the Ministry of Health rather than true costs. In practice, the actual costs of treatment in the private sector are more than the official tariffs.

Stomach cancer treatment is a combination of surgery, chemotherapy, radiation therapy, and supportive treatment, that Chemotherapy remains the cornerstone of treatment for gastric cancer patients with locally advanced and metastatic disease (Choi et al., 2015). The costs pertaining to any surgery include physician's fees, hospitalization and hospital care, and pathological diagnosis of patients. Assessment of the costs of radiation therapy was based on radiation dosage and the type of radiation that depends on the patients' conditions. The costs of laboratory services included preliminary tests, pre-chemotherapy tests, follow-up tests, and other diagnostic radiology services, which were calculated based on medical tariffs, the number of chemotherapy received by each patient, and duration of follow-up after treatment in the private and public sectors. The costs of visits varied according to the number of visits and were calculated based on public and private tariffs. The prices of medicines in the public and private sectors have no difference in Iran and the costs of medication are the same in both sectors. Assessment of medication costs including chemotherapy and supportive medicine is performed for management of chemotherapy-induced complications. The dose of chemotherapy drugs is often determined based on body surface area. Medication costs were calculated separately for each patient based on the type and dosage of chemotherapy and supportive medications received, and then all calculated costs in the

private and public sectors were summed for each patient and the total costs per patient were obtained. To convert the costs obtained in rials to dollars, the price of dollar in the first 5 months of the current year was obtained from the Central Bank website, and according to the average fluctuation of the dollar, each dollar was estimated 28,774 rials (Central Bank website). The obtained costs were statistically analyzed with SPSS-19.

Since the data of this study were collected from patients' medical records, their defects such as incomplete forms and incomplete recording of measures taken or patients' death can be considered as limitations of this study. Research ethics were observed at all stages of the research. Researchers began data collection after receiving an introduction letter from the School of Management and Medical Information. All information and patients' specifications were confidential.

Results

The total number of archival records from 2011 to 2014 in Shafa Hospital was 470 cases, and by taking inclusion criteria (patients with gastric cancer, admittance from 2011 to 2014, completeness of records, and record of all stages of treatment) and exclusion criteria, 310 cases were excluded and the remaining 160 cases were investigated.

Since the disease is usually diagnosed at an advanced stage, 151 out of 160 patients were treated in just one step within the 4 years and had no changes in the disease stage, but 9 patients received treatment in two phases with the disease progressing. Therefore, the direct costs of treatment were assessed for 169 patients [151+ (2×9)] at different stages. Stage I disease is divided into two parts of Ia and Ib. Surgery is the treatment method in Stage Ia, but chemotherapy and radiation therapy are used for Stage Ib in addition to surgery. Due to the low number of patients in Stage I in this study, the number of patients in this stage is expressed as a combination of patients at Stages Ia and Ib. The number and age distribution of patients at different stages of the disease are described in detail in Table 1.

The mean of age in patients with stomach cancer in the study was 65 years. Of the total samples, the lowest and the highest percentage of patients belonged to Stages I and IV of the disease, respectively. Table 2 depicts the recommended chemotherapy protocols according to the latest treatment guidelines in 2015 along with their costs.

According to Table 2, IPB is the most expensive chemotherapy protocol usually prescribed in special cases covered by certain insurances with a high percentage of reimbursement. ECF and EOF are the cheapest treatment protocols prescribed. The short course of treatment with these two protocols is one of the reasons of their inexpensiveness. DCF is the most effective treatment protocol followed by IPB and EOX. These three protocols are currently prescribed more than other recommended protocols.

Review of 160 cases showed that the treatment protocol of FL was the most common prescribed protocol

Table 1. Distribution of Ages of Patients at each Stage of Disease

Stage	Number of patients	Percent of patients	Mean of age (Standard Deviation)
I	8	5	56.75 (8.9)
II	32	20	59.06 (7.28)
III	48	30	64.12 (10.65)
IV	72	45	68.06 (7.05)
Sum	160	100	65 (8.86)

Table 2. Categories of Chemotherapy Protocols and their Costs (IRR)

Chemotherapy protocol	Treatment intervals	Treatment courses	Minimum cost	Maximum cost
DCF (Docetaxel + Cisplatin + Fluorouracil)	Every 3 weeks	6-8 courses	20,000,000	25,000,000
CF (Cisplatin + Fluorouracil)	Every 4 weeks	4-6 courses	10,000,000	15,000,000
ECF (Epirubicin + Cisplatin + Fluorouracil)	Every 3 weeks	6-8 courses	5,000,000	7,000,000
EOF (Epirubicin + Oxaliplatin + Fluorouracil)	Every 3 weeks	6-8 courses	5,000,000	7,000,000
ECX (Epirubicin + Cisplatin + Capecitabine)	Every 3 weeks	6-8 courses	10,000,000	15,000,000
EOX (Epirubicin + Oxaliplatin + Capecitabine)	Every 3 weeks	6-8 courses	15,000,000	20,000,000
IP (Irinotecan + Cisplatin)	Every 4 weeks	4-6 courses	8,000,000	10,000,000
IPB (Irinotecan + Cisplatin + Bevacizumab)	Every 3 weeks	6-8 courses	80,000,000	1000000000
FLO (Fluorouracil + Leucovorin + Oxaliplatin)	Every 2 weeks	12 courses	8,000,000	10,000,000
Capecitabine + Cisplatine	Every 3 weeks	6-8 courses	7,000,000	12,000,000
FL (Fluorouracil + Leucovorin)	Every 3 weeks	6-8 courses	10,000,000	12,000,000

Table 3. Chemotherapy Protocols and the Average Cost of Treatment

Stage	Patients number	Number of FL protocol	Mean cost of FL protocol	Number of ECF protocol	Mean cost of ECF protocol	Number of EOF protocol	Mean cost of EOF protocol	Number of DCF protocol	Mean cost of DCF protocol
I	8	6	60000000-72000000	2	10000000-14000000	-	-	-	-
II	32	12	120000000-144000000	9	45000000-63000000	6	30000000-42000000	5	100000000-125000000
III	48	15	150000000-180000000	16	80000000-112000000	14	70000000-98000000	3	60000000-75000000
IV	72	17	170000000-204000000	27	135000000-189000000	25	125000000-175000000	3	60000000-75000000
Sum	160	50	500000000-600000000	54	270000000-378000000	45	225000000-315000000	11	220000000-275000000

FL: Fluorouracil + Leucovorin; ECF: Epirubicin + Cisplatin + Fluorouracil; EOF: Epirubicin + Oxaliplatin + Fluorouracil; DCF: Docetaxel + Cisplatin + Fluorouracil

Table 4. The Average of Total Costs and Monthly Costs of Treatment at Different Stages of the Disease in Public and Private Sectors (IRR)?

Stage	Total costs (IRR)				Standard Deviation	Monthly costs (IRR)	
	Mean		Minimum	Maximum		Mean	
	Private	Public				Private	Public
I	77894675	63045879	45218962	68725301	16621492	11057635	9648210
II	115489357	76047934	56804780	83694025	19013567	16439217	10873645
III	127506835	82783019	70856214	88462173	12449293	20458379	12587002
IV	132589650	76943800	61259640	83548973	15760939	18042684	11836900
Mean of 4 stages	113370129	74705158	58534899	81107618	15961322	16499478	11236439

Table 5. Share of Treatment Cost Relative to the Total Cost of Treatment in Each Stage of the Disease in Public and Private Sectors?

Stage	Medications cost		Chemotherapy cost		Surgery cost	
	Private	Public	Private	Public	Private	Public
I	-	-	-	-	66.3	62.3
II	53.8	53.8	11.6	9.8	8.8	10.3
III	59.4	59.4	12.1	10.4	7.9	8.6
IV	62.9	62.9	13	10.7	6.4	7.5
Mean of 4 stages	56.3	56.3	9.8	9.2	17.2	16.7

Stage	Radiotherapy cost		Tests/radiology cost		Visit cost	
	Private	Public	Private	Public	Private	Public
I	13.7	14.2	11.4	13.8	8.6	9.7
II	10.2	12.5	8.3	7.2	7.3	6.4
III	8.5	9.2	5.6	6.1	6.5	6.3
IV	7.3	8.7	4.7	4.8	5.7	5.4
Mean of 4 stages	7.3	6.9	6.2	5.9	5.4	5

Table 6. Share of Direct Cost Centers for Stomach Cancer Related to Patients and the Insurer

Provided health care	Medications cost	Chemotherapy cost	Surgery cost	Radiotherapy cost	Tests/radiology cost	Visit cost
Costs (IRR) Share from total treatment cost	42059004	6872874	12475761	5154655	4407604	3735258
Patient's share	4205901-12617702	-	623789	-	1322281	-
Insurer's share	29441302-37853103	6872874	11851972	5154655	3085323	3735258

for patients in Kerman City and the main reason for administration of this protocol was its reasonable price and short treatment term that was suitable for patients attending from nearby towns with accommodation problems in Kerman. EOF, ECF, and DCF were the next administered protocols.

At any stage of the disease, patients should receive chemotherapy for 4-6 months; however, in metastatic patients, the protocols should continue until a response to treatment is gained or drug-induced side effects occur. Accordingly, the number of patients of each stage is shown in Table 3 by the type of protocol and the course of treatment.

The total cost and monthly cost of treatment at various stages of the disease are given separately for public and private sectors in Table 4. The treatment costs of 9 patients whose diseases progressed during the 4 years of the study period and reached Stage IV were removed from the initial treatment phase and calculated for Stage IV.

According to Table 4, the highest mean cost of treatment in public and private sectors was observed in Stages III and IV of the disease, respectively, and

the lowest mean cost of treatment in Stage I of the disease in both public and private sectors. Overall, the total direct medical costs for a patient with stomach cancer were 2596.26 USD (74,705,158 IRR) for the public sector and 3904.01 USD (113,370,129 IRR) for the private sector. The dollar exchange rate in the first 6 months of this year was considered 28,774 IRR. The estimated cost is based on costs imposed on patients and the health insurance. The costs of visits, radiotherapy, and chemotherapy are completely paid by the insurer to patients with insurance coverage who attended public health centers. But if patients attend private treatment centers, only 25% of the costs are paid by the insurer. The cost of each chemotherapy session in the private sector is up to 1,400,000 IRR. Radiation therapy is only done at public health centers. Regarding the costs of diagnostic tests and radiology, in case of attending public health centers, 70% and 30% of the costs are paid by the insurer and the patient, respectively. But if the patient attends a private health sector, only 30% of the costs will be paid by the insurer. Surgery in public hospitals costs only 5% for patients under insurance coverage and the bulk of

operating costs (95%) are paid by the insurer. The costs of medicines for insured patients are paid 70%-90% by the insurance company and 10%-30% by patients. In general, the share paid by patients in each of 4 treatment stages in public centers is much less than the amount estimated in private centers.

Based on Table 4, the costs of treatment in private hospitals in all stages is higher than public hospitals. The difference between the cost of treatment in private and public sector is lower in Stage I compared to other stages. The reason for this small difference can be explained as follows. Given that the main treatment is surgery at this stage of the disease, the difference between the cost of surgery in public and private sectors is less than other healthcare services. However, unofficial costs related to surgery in private hospitals are not included in this table. The cost of treatment at each stage of the disease varies based on the type of treatment used. Table 5 shows the share of treatment costs in different stages according to treatment method.

According to Table 5, the main burden of treatment costs and the lowest cost in Stage I of the disease are related to surgery and visit, respectively. No medication is prescribed or chemotherapy done at this stage. The highest and lowest costs in Stage II belonged to medications and visits, respectively, and the highest and lowest costs in Stages III and IV were related to medications and tests/radiology, respectively. It was concluded from review of the disease process that the costs of medication and chemotherapy increased from Stage I to Stage IV, but the cost of surgery, radiation therapy, tests/radiology, and visits reduced. The results are similar in both public and private sectors.

According to the results of the direct costs of treatment for stomach cancer in Kerman, the average total cost of treating a patient in public sector was estimated 74,705,158 IRR, of which, 60,141,384 IRR was paid by the insurer and 14,563,774 IRR by patients. Given the share of each service provided from the total costs of treatment (Table 4) and with regard to the insurer's share, the amount paid by the patient and the insurance company is shown in Table 6.

Discussion

The aim of this study was to evaluate and compare the direct medical costs of stomach cancer in Kerman Province and to estimate it for the entire country. The mean age of patients was 65 (±8.86) years. The mean age of patients in several studies performed in Iran was between 62 and 65 years (Ahmadi et al., 2011; Amani et al., 2012; Nourozinia et al., 2013), which is consistent with the present study. In a study conducted in Nepal, the mean age of patients have been reported 59.6±12.4 yers (range 29 to 78 yers).(Kumar Sah et al., 2015).The disease begins usually in the 4th and 5th decades of life and the prevalence of the disease increases with aging with a maximum prevalence in the 7th decade of life (Biglarian et al., 2007). Given the lack of specific screening and the slow nature of the disease (Ahmadi et al., 2011), it is detected in older ages and in advanced stages. In a study

conducted in Tehran Cancer Institute, the mean diagnosis age was 57 years, and the mean diagnosis age in women was in average 3 years less than that of men (Roshanaei et al., 2010). In a similar study by Phaorah (Pharoah et al., 2001), the mean age of patients with stomach cancer at diagnosis was 40 years (14-85 years). In this study, the mean age at diagnosis was also averagely 2 years lower in women than that of men.

With regard to the role of genetics, environmental factors, and lifestyle in occurrence of stomach cancer, the low age of disease in Iran compared with advanced countries can be attributed to socio-economic status, environmental pathogens (Khedmat et al., 2007), being multifactorial, and undesirable lifestyle including eating habits (Iravani et al., 2013). Low age of occurrence and high diagnosis age not only impose direct treatment costs to patients and payer organizations, but also inflict huge indirect costs on both patients and society.

Out of all patients in this study, 103 (65%) were men and 57 (35%) were women. The number of men was almost double that of the women. In a study by Amani, 60.3% and 39.7% were males and females, respectively (Amani et al., 2011).

Most patients treated in this study were at the Stages III or IV of the disease, which was due to the occurrence age, and the lowest percent of patients was seen in Stage I. In a study by Noruzinia, the frequency of stomach cancer at the age of over 70 years was estimated more than that in other age groups (Nourozinia et al., 2013). In a study by Biglarian, only 9% of patients were referred at Stage I and the remaining were referred at more advanced stages of the disease (Biglarian et al., 2007).

The mean age of patients with stomach cancer of Stage I and Stage IV was 56.75 and 68.06 years, respectively. In a study by Ahmadi et al. in Tehran, the mean age of patients was 56.4 and 65 years in the first stage of the disease and the metastatic phase, respectively (Ahmadi et al.,2011), which is consistent with the present study.

Single-drug and combination therapy protocols are used for treatment of gastric cancer. But the single-drug protocols are less prescribed due to low response to treatment (20%). Combination treatment protocols are more effective and have fewer side effects for patients. In a study that has been conducted in this field, the results showed the effects of cancer treatment with single drug such as cisplatin, fluorouracil or Epirubicin is not very different, but the effect of the three-drug combination therapy is much more (Alizadeh et al., 2016). The most commonly prescribed treatment protocols in the present study were FL, ECF, EOF, and DCF, the latter being more expensive and more effective than the rest. The findings of a study about the efficacy of therapeutic protocols showed that side effects and high cost of DCF treatment protocol in comparison to ECF lead to less prescription of this protocol particularly in poor people. In terms of clinical response to treatment or survival, no difference was observed between the two treatment protocols. However, the results of this study, as stated by the researcher, may not be generalizable to all patients due to limited number of samples (Sedighi et al., 2006).

The study findings suggest that the average direct cost

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of treating patients is higher in Stage III and lower in Stage I than the other stages. The result is the same for public and private tariffs. Lower direct cost of treatment in Stage I may arise from early detection and proper conditions of patients for surgery, and treatment response is associated with high survival of patients.

Also, there is no need for chemotherapy if the disease is detected at this stage. No need for chemotherapy at this stage is the most important reason for the low direct cost of treatment in this group of patients. In general, the total direct cost of treating patients with gastric cancer was estimated 2048.5 USD (74,705,158 IRR) with public tariffs and 2882.15 USD (82,931,091 IRR) with private tariffs. In a study conducted in Ardebil in 2012, the average direct cost of treatment of gastric cancer with public tariffs has been reported 9,520,000 IRR (Amani et al., 2012). Increased tariffs in 2015 compared to 2012 and high rates of inflation in recent years are the main reasons for the large difference between estimated costs in this study compared to those conducted in 2012.

Surgery is the main treatment of patients with Stage I disease, while the next stages are treated with chemotherapy. As a supportive treatment method, radiation therapy is used in the early stages of the disease. Radiation therapy is done free of charge at public facilities. The direct cost of this treatment method is paid by the payer organizations, rather than patients. As the disease progresses, the direct cost of surgery, radiation therapy, tests/radiology, and visits reduce, while the direct costs of drug therapy and chemotherapy increase. Amani et al. (2012) concluded that the top three priorities for direct costs of gastric cancer treatment include drugs used in the ward, patient stay, and drugs used in the operating room.

Since private and public tariffs as well as prices of medicines and protocols are the same across Iran, generalizing the results to the entire country seems logic. Given that the actual cost of treatment in private sector is more than official tariffs, the costs of treatment of patients in private sector were more than those estimated in this study. The data collected in this research were from patients' medical records; therefore, defective files such as incomplete forms completed by healthcare providers and relevant staff, and drawbacks associated with records can be stated as the limitations of this study.

In conclusion, direct costs of gastric cancer treatment based on the tariffs approved in 2015 were 2048.5 USD (74,705,158 IRR) in the public sector and 2882.15 USD (82,931,091 IRR) in the private sector. Due to the lack of screening programs, the disease is often diagnosed at an advanced stage; therefore, the main burden of the cost is related to medications. Same prices of medicines in public and private sectors lead to low cost of treatment in both sectors. The cost of treatment in the private sector, on the other hand, is paid by insurance companies according to state tariffs and patients pay only the difference between the tariffs. Given the relative lack of studies in this field, analysis of the treatment costs of cancer patients is among the key issues addressed in the Ministry of Health. It is necessary to analyze all aspects of health costs to help reduce the costs incurred to patients, insurers, and the healthcare system.

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