Effect of Cost Sharing on Utilization of General Physician Care: A Cross-Sectional Survey from Shiraz, Iran

Abstract

Introduction: High-cost sharing in physician care may result in worse health outcomes and financial burdens for individuals, and it reduces needed health-care utilization. Hence, this study examines the impact of cost sharing on utilization of Physician care. **Methods:** In the present study, multistage sampling ($n = 1610$) was done to collect general physician utilization and quality of life. Count data model was used to analyze the effect of cost sharing and other factor on the ratio of referring to the general physician. Negative binomial regression was employed to analyze the utilization model. **Results:** People who have high-cost sharing had used general physician services much less, so that ratio of incidence among them was 0.18 less than individuals with low-cost sharing ($P < 0.05$). Gender and age variables showed a significant effect on the demand for the general physician visit ($P < 0.05$). **Conclusions:** A low cost-sharing policy would remove the clinically and financial threat from the patient decision-making so as to provide them with access to needed care.

Keywords: *Cost sharing, general physician, health*

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Introduction

There was an special attention of health systems to financial protection of the household against economic burden of diseases after world health report 2000. Fairness in financial contribution index, catastrophic health expenditure and also impoverishment due to health expenditure have caused the policymakers to attempt to find interventions and policies to reduce economic burden of diseases and decrease the out-of-pocket payments.[1-6] On the other hand, due to outsized medical expenditures, the current insurance policies rely heavily on high cost-sharing or other price-related approaches.[7-12] In most health systems, patients required financial contribution as to the use of health services which is called cost sharing.[11] It can be in the form of deductibles, copayments, and coinsurance.[13] In this way, cost sharing aims to reduce social welfare waste by insured individuals due to moral hazards.[14-16] Unfortunately, while cost sharing can reduce the utilization of unnecessary services, high cost-sharing policies might produce a new problem by reducing the utilization of effective and necessary care. Cost sharing makes people to consume less health services and lower total health- care expenditure in comparison with with full coverage.[1,7-9,11,12,17]

As a result of high-cost sharing, patients will cut back on both needed and discretionary care.[18] This situation would be worsening for seriously ill and low-income people.[19] People with severe illness may face financial and medical hardships; besides their overall poor health status and functional status, either physically or mentally, they have a heavy out-of-pocket financial burden.[20] Thus, a policy question arises: What is the impact of cost sharing on health care utilization for those with severe health conditions?

Several studies in Iran showed that in spite of high coverage of health insurance, the proportion of households facing catastrophic health expenditure was high[21-24] and this might have resulted from inappropriate benefit package or high-cost sharing.

Hence, this study focused on cost sharing in general physician care, among which primary care plays a central role in a health-care delivery system. It is the first contact, a patient makes with the health- care system, especially in cities and is ideally the means by which health-service delivery is coordinated in a comprehensive and continuous manner

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to meet an individual's health-care needs.[25] Besides the frontline role of primary care, as a whole general physician care is an upstream service that maintains people's health status and prevents individuals from avoidable downstream emergency room (ER) visits, hospitalizations, and worse health outcomes.[26,27] In the present study, we tried to find the effects of general physician cost sharing on medical services utilization.

Methods

Study design

This household survey was conducted in Shiraz city in 2012. Shiraz is the sixth most populous city in Iran and is the capital of Fars Province; its population was 1,517,653 in 2012.

In the present study, the average number of referrals to general practitioners was used as the main variable. This measure was estimated 2.2 based on health services utilization in 2002[28]

Sample size was estimated 1538, using the following formula:

$$n = \frac{z^2_{1-\frac{\alpha}{2}} \times \sigma^2}{d^2}$$

where d = 0.1, $\sigma = 2$ and confidence level is 0.95. With nonresponse rate of 0.5, the sample size was increased to 1610 based on $\frac{1538}{1-\frac{0}{05}}$.

In any family, two people were sampled. Hence, the sample size in terms of family was 805. The multistage sampling method was performed. In the first stage, according to Shiraz municipal classification, the city was divided into nine clusters. Sample size for each cluster was determined based on its population. In the second stage, 10 urban residential blocks were randomly selected according to the city maps. In the third stage, families were selected using systematic sampling and in the last stage of each selected household two members were selected using the Kish method.

Study instrument and variables assessment

Two questionnaires were used as the study tools. One was developed to collect data about individuals' usage of general physician services and included data, health insurance, costs of general physician services, and frequency of general physician visit.[29]

Internal validity of this questionnaire was confirmed by experts, and its reliability was determined using a pilot study performed on 30 subjects (Cronbach's alpha 0.74).

The second questionnaire was quality of life questionnaire SF36. This questionnaire has been nationalized in Iran by Montazeri *et al*. and its reliability and validity were evaluated and confirmed using statistical analysis of internal consistency and convergence validity method, respectively. The questionnaire evaluates eight parameters as follows: physical functioning, physical role, bodiy pain, general health perception, ability of vitality, social functioning, emotional role, and mental health. Based on the questionnaire, minimum and maximum possible scores for each dimension of quality of life and total quality of life is between zero and 100. The quality of life was classified into three levels of low, medium, and high. The scores higher than 75 equals to high quality of life, the scores between 50 and 75 means medium quality of life and the scores below 50 equals to low quality of life.[30]

Statistcial analysis

The econometric model based on theoretical principals is:

MD visits = $\beta_0 + \beta_1$ CS + β_2 H + β_3 Y + β_4 I + β_5 E + β_6 G + β_6 A + u_i

where, GP visits, CS, H, Y, I, E, G, A, and u_i show the number of GP visits, cost sharing, health status, income, insurance coverage, educational level, gender, age, and disturbance term, respectively.

The number of GP visits, as the dependent variable, is the count-form variable, so count data regression was used for estimation of cost-sharing effect on the utilization of GP services. With respect to over-dispersion phenomenon in data, negative binomial model was used for estimating the parameters of model. Furthermore, negative binomial model is more flexible than Poisson model.[31,32] The study was confirmed ethically in research deputy of Shiraz University of Medical sciences.

Results

Descriptive results

Results showed that the average of using general physician services was 0.76 (±1.22) during the study. These numbers show dispersion of this variable distribution in the sample. The average of cost sharing among the study population was high 0.81 (±0.52). More than 87% of people were faced with high-cost sharing. According to the obtained results, the average score of quality of life of study population was 0.73 (±0.17). The mean age of the participants was 36 years. More descriptive results have been shown in Table 1.

Results of model estimation

All results of model estimates are shown in Table 2. The results of negative binomial regression showed that any increase of cost sharing leads to a decrease in using general physician services. People who have high cost sharing had significantly used general physician services less than others the incidence rate ratio among them was 0.18 less than individuals with low-cost sharing (*P* < 0.05). Results also

Table 1: Descriptive results (1575)

Variables	Category	Frequency (%)
Cost-sharing (%)	Low (0-20)	87 (12.9)
	High (21-100)	586 (87.1)
Education	Less than elementary	98 (5.6)
	Elementary	107 (6.8)
	Guidance school	149 (9.5)
	High school	522 (33.2)
	Academic	704 (44.9)
Income	Very low	83 (5.3)
	Low	554 (35.2)
	Medium	649 (41.2)
	High	187 (11.9)
	Very high	102 (6.5)
Health	Low	178 (11.3)
	Medium	571 (36.3)
	High	825 (2.4)
Gender	Female	857 (55.5)
	Male	718 (45.5)
Insurance	Yes	1359 (86.3)
	No	215 (13.7)
Age	18-34	841 (53.4)
	35-64	646 (41)
	<65	88 (5.6)

Table 2: Negative binomial regression estimates for physician visits

Variables	Category	β	SE	P	IRR
Cost-sharing	Low	Reference	0.08	0.015	0.82
	High	−0.19			
Education	Less than elementary	Reference			
	Elementary	0.07	0.14	0.15	1.08
	Guidance school	−0.19	0.14	0.12	0.82
	High school	−0.12	0.13	0.11	0.87
	Academic	−0.05	0.13	0.12	0.94
Income	Very low	Reference			
	Low	−0.25	0.14	0.08	0.77
	Medium	0.16	0.14	0.24	1.1
	High	0.01	0.16	0.93	1.02
	Very high	0.35	0.17	0.04	1.4
Health	Low	Reference			
	Medium	0.18	0.09	0.62	0.05
	High	−0.12	0.1	0.53	0.2
Gender	Male	Reference			
	Female	0.34	0.06	0.00	1.4
Insurance	Yes	Reference	0.08	1.14	0.11
	No	−0/13			
Age	18-34	Reference			
	35-64	0.31	0.08	0.00	1.36
	>65	0.55	0.13	0.00	1.73

LR χ^2=161.37   Pseudo R^2=0.0000 $P>\chi^2$=0.0394

SE=Standard error, IRR=Incidence rate ratio, LR=Likelihood ratio

showed that educational level had a significant decreasing effect on the ratio of general physician visits. The level of income in different income groups had effects on the consumption of general physician services. The low-income variable was significantly negative, and in the next two income groups, the effect of income was positive and nonsignificant. In addition, in the group with high income, the incidence rate was 20% more than the reference group, and this finding was significant. According to the results, quality of life had different effects on the use of general physician services. In the group with average quality of life, the incidence ratio was 10% higher ($P < 0.05$) while in the group with high quality of life, the incidence ratio was 13% lower but nonsignificant. The incidence ratio of general physician services usage was significantly 40% higher in females as compared to males. People without insurance have used the general physician services more. In addition, age showed a positive and significant effect. The general physician uses rate increased with increasing age.

Discussion

Decision about how much households or individuals share the cost of health-care services in other word, Introduction of user fee will have special effects on equity in access and fairness in financial contribution. Hence, the policymakers should be aware of impacts of cost sharing According to the results, people with high level of cost sharing use general physician services less than people with low level of cost sharing. This impact of cost sharing on health services use was approved in other studies. Leiyu in their experimental study (2005) placed a requirement of 25% for in-patient services and all the out-patient services, and their results showed that consumption and costs of medical services decreased significantly and it was stable for 4 years.[27] Scheffler *et al*. (1998) also reported that a common average payment of 7.5 dollars for physician visits was related to a notable drop in consumption of all in-patient and out-patient services for all people.[26] Chandra (2007) and Cherkin (1989) *et al*. also showed that increase in cost sharing was associated with lower hospital visits.[9,33] Cherkin *et al*. reported that increased cost sharing for hospital services led to a decrease in primary care and physical tests visits for people with chronic diseases; however, there was no impact on the specialist visits, cancer screening, and immunizations.[9] Hibbard *et al*. also indicated that high-cost sharing leads to a decrease in both effective and less effective services.[34] However, Feldman *et al*. (2007) showed that in 3 years after increasing the cost sharing, services consumption per year increased.[35] It seems that policymakers cannot introduce user fee or increase cost sharing without considering its impacts on utilization. If they try to use cost sharing as a tool to restrict unnecessary medical usages, they should pay attention to vulnerable groups who may overlook the use of health services in the case of need. Furthermore, cost sharing should be progressive to secure access of the poor.

According to the present study, people with low health level significantly use services less. A question arising

is that why people with poor health status use medical services less; yet, they should use these services to restore and improve their health. Probably, they belong to the low economic quintile of population so they cannot afford health services and their medical needs may be unmet. On the other hand, as we just asked about general physician services, so maybe the needs of individuals with poorer health status are not meet through general physician, and they need specialized services. Xi also showed that people with low health level use general physician services 66% less than those with medium health level.[1]

Regression analysis also showed that people with low health level decrease their use 0.158% in contrast to those with high health level in case of increase of cost-sharing level. This result highlighted the negative impact of the user fee on people with poor health. Hence, they are overlook the use of the services or, probability of facing with catastrophic health expenditure or falling into poverty will be increased in case of use. All of these lead to continuity of poverty-illness cycle. Manning *et al*. showed cost sharing decreased both effective and noneffective cares and had a reverse effect on the poor with ill health.[10] Link *et al*. showed that Medigap politics increased medical visits based on different health conditions - 42% for people without any chronic conditions and only 5% for those with at least one chronic condition.[36] Amitabh *et al*. showed that any increase in common payments for prescription drugs and medical care had little impact on the use of hospitals for the elderly. For elderly patients with chronic conditions, a significant increased effect was seen on hospital admissions while use of drug and physician was decreased.[33] Gibson *et al*. showed people with chronic diseases decreased consumption of prescription drugs due to high-cost sharing, and this leads to avoidance of using the drugs advised.[37] Xi also showed that people with bad health conditions have a tendency toward the less reduction of necessary medical care consumption than normal healthy population in response to high-cost sharing. In addition, people with bad health conditions experienced enhancement of emergency department cares, leading to a worse clinical condition.[1]

The impact of income on medical services consumption

There is a positive relationship between income and general physician services consumption except in the second quintile. As the population in a society reaches the quintile, they use medical services nearly 41% more.

According to the results, it is approved that there is a positive relationship between aging and demand. Thus, the elderly people used medical services 36% more than young people. Based on the Grossman's theory, people tend to wear out over time and while aging their wear rate is increased, so they demand more treatment services. Some experimental studies also showed a positive relationship between these two variables.[1,10,34,38,39]

In the present study, there was a negative relationship between education and medical services consumption. It can be said that the incidence rate of services consumption for people with academic education was 6% less than those with elementary education. In order to justify this, it can be said that people with higher educational level are in the better situation than those with lower educational levels due to obtaining information from the media, awareness of healthy diet and health hazards in the workplace and…. Therefore, people with higher educational levels upgrade their health level with less consumption of health inputs.

The obtained results showed that females demanded general physician services more than males, so that incidence rate among them is 40% higher than males. In the case of gender, different treatment behaviors have been observed between males and females.[1,10,38,39] As an example, in childbearing age, women seek health care more extensively in contrast to men. However, at older ages, they seek cares much less than men and basically they live longer than men.[38] According to the information about common diseases among men and women, it seems that heart attacks, as an example, among men are higher than women and also the trend of prostate disease and breast cancer among men and women is almost similar, or cancer is primarily more common among men than women. Hence, although these factors may have not much effect on treatment seeking in contrast to other factors, researchers still use these factors due to finding significant differences in treatment seeking.[1,40]

In the present study, there was no significant relationship between insurance coverage and general physician services consumption. To justify this case, it can be said that designing and implementation of public insurance plans without any attention to important factors such as socioeconomic status of families of the country, demographic profiles, and patterns of epidemiology of diseases in the country are the reasons of lacking efficiency plans and programs of social health insurance in support of the patients. In addition, in Iran, health insurance benefit packages are limited, and a wide range of services are not covered; yet, the participation rate of insurance in payment of health services fees is high in some insurance programs. In addition, drug and new health technologies that have recently been marketed may take some time to get into the benefits package due to long-term legal-administrative process and political aspects.

Severely ill individuals most usually have low income[1,10,34,38,39] as it was identified in this study, the severely ill group had a significantly higher proportion of poor patients than the healthier group. Thus, the sick and poor group's financial problems made them sensitive and vulnerable to high cost-sharing policies that constrained them from maintaining adequate necessary health care, and their utilization reduction magnitude was likely an

involuntary behavior rather than an active choice. Thus, in response to high cost-sharing pressure, severely ill individuals could experience substantial physician care education, ER care increase, and worse clinical conditions. However, high cost-sharing policies actually thwarted their need for more frequent physician care.

Conflicts of interest

There are no conflicts of interest.

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