

Study of Out-of-Pocket Expenditures for Outpatient Imaging Services in Imam-Khomeini Hospital in 2014Sima Marzban¹, Roya Rajaei^{2,3}, Soheyla Gholami⁴, Meysam Safi Keykale⁵, Marziye Najafi^{2,6}

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Abstract

Background: Direct out-of-pocket (OOP) payment is the most inequitable way to pay for healthcare services, and this trend exposes patients and their families to backbreaking financial risks. The aim of this study was to estimate the out-of-pocket expenditures for outpatient imaging services in Imam-Khomeini Hospital in Tehran.

Methods: This cross-sectional study was conducted in 2014 on 100 users of outpatient imaging services (radiology, ultrasonography, CT-scan, and MRI) in Imam-Khomeini Hospital in Tehran. Structured interviews and the analysis of related documents were used to acquire the pertinent data. The percentage of out-of-pocket expenditures was obtained by dividing the out-of-pocket expenditures by the total expenditures paid to the service provider, i.e., the sum of out-of-pocket expenditures and insurance payments. To analyze the data, we used descriptive-analytic statistics, distribution indices, the t-test, and the Pearson product-moment correlation coefficient.

Results: Health insurance covered 84% of costs incurred by users of outpatient imaging services. There was no significant relationship between the user's age and the amount of out-of-pocket expense ($p = 0.01$). The relationship between the user's gender and out-of-pocket expense was significant ($p = 0.05$). The average payment for males was greater than the average payment for females. The highest percentage of the total payment the users incurred was 41% for a CT-scan, and the lowest percentage the users incurred was 30% for radiology services.

Conclusion: It is suggested that expensive diagnostic tests, such as CT-scans, be prescribed according to the actual needs of patients to make the financial burden of diagnostic services reasonable for all patients.

Keywords: out-of-pocket payment; imaging services; outpatient services

1. Introduction

Managing financial resources is one of the main functions of a healthcare system (1). Different methods are used to collect revenue in healthcare systems, such as public taxes, compulsory contributions for social health insurance (usually based on one's wages with little or no consideration of risks), voluntary participation in private health insurance (usually considers risks), out-of-pocket (OOP) payments along with endowments and private donations (2). The main determining factor in fair financing of the healthcare system is the amount of prepayment required and

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its percentage of the total expenditure required to obtain healthcare services. Out-of-pocket payment is the most inequitable method of payment for healthcare, and it makes those who seek healthcare vulnerable to potentially catastrophic financial burdens (3). While financing healthcare in most countries where incomes are high is dependent upon public taxes or the provision of social healthcare insurance (4), out-of-pocket payment by the patient is the main financing mechanism in most Asian and developing countries (5). Out-of-pocket payment is the cost that is incurred directly by the patient when insurance does not cover the total costs incurred for healthcare services (6). Individuals incur out-of-pocket expenditures when they must pay for all their healthcare services and when they pay for a portion of their healthcare services while other payers, such as the government or private health insurance companies, pay the remaining balance (7). Out-of-pocket payment, in which the individual pays the service provider directly, is the simplest and least-effective payment method (8). These non-reimbursable, out-of-pocket payments include the premium payments for health insurance and paying directly for healthcare services when there is no insurance coverage. These expenditures can include the costs for caring for the patient at home; purchasing medicine and equipment, such as prescription drugs and a walker; providing special dietary needs, such as low-sodium foods; providing transportation to medical appointments and other required outings; and obtaining diagnostic services (9).

In countries in which people have no financial support for healthcare, the costs associated with diseases or injuries can be completely overwhelming to many, if not most, of the people in the population. The expenditures they can incur include out-of-pocket expenditures related to medical treatment and indirect expenditures, such as reduced income that results from the inability to work or go to the hospital. Treatment expenditures often consume a significant share of the family's income, forcing the entire family into poverty (10). Today, the lack of financial protection in obtaining healthcare is regarded as a serious malady of healthcare systems, the clearest sign of which is that when families have to deal with the burden of diseases, they simultaneously must face the burden poverty due to the backbreaking expenditures in their healthcare system (8). When the healthcare system depends on out-of-pocket payments from individuals to meet their healthcare needs, such individuals likely will incur backbreaking payments. The World Health Organization (WHO) has identified the expenditure of funds to protect people from diseases as one of the three main objectives of a healthcare system (11). Every year, 100 million people throughout the world become poor because they have to make personal payments for healthcare. Thus, governments and private enterprises concerned with healthcare systems should focus on two, interconnected issues, i.e., caring for the personal health of individuals and caring for their financial health (4).

The current challenge for the governments of low-income countries is to reduce the progressive burden of out-of-pocket expenditures through state-supported payment plans. This is essential if we ever expect to reduce the personal expenditures that create financial risks and backbreaking costs for individuals and families (2). In 2006, Medicare part D went into effect to provide support against high out-of-pocket payments for prescribed medicines. High levels of out-of-pocket payments for healthcare services may cause people to ignore the need for healthcare services and medicines because of the choice they have to make between healthcare and other basic needs, such as food and housing. A system that forces the poor people in a society to make such a heart-rending choice is certain to lead to a reduced quality of life among such individuals. Out-of-pocket payments for healthcare have been identified as a common cause of bankruptcy cases among sick or injured people who seek access to healthcare (12). According to the statistics of the Ministry of Health in October 2012, about 5-7% of people fall below the poverty line because of their expenditures for medical issues (13). In fact, out-of-pocket payments of people for medical care can be reduced through financial support by the government or private health insurance; some countries consider the requirement for out-of-pocket payments for healthcare to be an obstacle that stands in the way of people accessing and using healthcare services when they are needed. Families who cannot afford to pay for medical services must either postpone acquiring the healthcare they need or forego it altogether. On average, in all OECD member nations, 19% of health payments are paid directly by the patient (6). The data about Out-of-pocket expenditures are not normally excited, therefore, collecting this kind of data is difficult (14).

According to WHO, value of out-of-pocket payment for sanitary expenditures in 2008 in Vietnam, Cambodia, and Laos were 14%, 3.4%, and 1.7%, respectively, and, in 2009, it was 1.2% for the Philippines (15-17). A study conducted in 2013 indicated that the share of out-of-pocket payment in Germany, France, Japan, and Cuba was 10%, and the shares in the USA, Bahrain, Turkey, Malaysia, Pakistan, and Iran were 18, 21, 30, 40, 75, and 56%, respectively (13). When there is a person in a family in the U.S. who has a chronic disease, the family spends 10% of its annual income on OOP payments for healthcare services (9). In 2010-2011, the Australian Institute of Health

and Welfare (AIHW) estimated that \$24.3 billion in healthcare payments were made directly by individuals. OOP payments in Australia were double those of the United Kingdom and New Zealand (18). It is the main task of any government to provide public healthcare, and article 29 of the law of the Islamic Republic of Iran is focused on this issue. The Iranian Fourth Development Plan includes a provision to reduce OOP payments in Iran for healthcare and medical services up to 30% (13). Another of the objectives of the Health Development Plan in Iran is to reduce OOP payment by hospitalized patients by as much as 10% (19).

For diseases to be treated properly, they first must be diagnosed correctly. Diagnostic services are a vital element to provide the best care measures for patients, because these services provide the information physicians need to evaluate and diagnose patients' conditions and provide the appropriate care. In addition, timely diagnostic services, which are a vital part of healthcare, will indicate whether the patient has a disease or not, allow more effective treatment, and ensure quicker recovery of the patient (11). In this study, we estimated the OOP expenditures for outpatient imaging services, and identified the most expensive imaging service.

2. Material and Methods

This descriptive, cross-sectional study was conducted in Imam Khomeini Hospital in Tehran in 2014. The sector of the population that we studied was people who sought outpatient imaging services at the hospital. The number of such people required for accurate statistical analysis of the results was estimated to be 100. Therefore, 100 people who sought imaging services at the hospital were selected randomly. The study was conducted through structured interviews with the outpatients who requested imaging services, and we also investigated the availability of any financial resources provided by the hospital for these outpatients. The amounts of OOP payments made by the patient and payments made by insurers, if any, were determined,

The percentage of OOP payments made by the outpatients was calculated by dividing the OOP payments made by the patient for each service (radiology, ultrasonography, CT-scan, MRI) was divided by the total payment required for each service, i.e., OOP payment by the outpatient plus any payment made by any basic and/or supplementary insurance. Furthermore, when time was available, we also investigated the personal situations of the outpatients.

This research study was approved by the Ethics Committee at Imam Khomeini Hospital. In addition, the confidentiality of the patients' names was observed through all stages of the research. Measures of central tendencies and measures of dispersion were to provide a better description of each imaging service that was used. SPSS Version 18 (SPSS, Inc. Chicago, Illinois, USA) was used to analyze the data. The Pearson correlation test was used to investigate the relationship between age and the amounts of the OOP payments, and the t-test was used to analyze the relationship between the outpatients' gender and the amount of the OOP payments they were required to make.

3. Results

The sample that was investigated in this study consisted of 100 subjects. The total percentage of OOP payments by patients was 32%, which was obtained by dividing the total amount of all OOP payments by the total cost paid (patients' OOP share, insurers' share, and state subsidies). In this regard, the highest OOP share, i.e., 41% was for CT-scan services, the least OOP share, i.e., 30%, was for radiology services. The highest OOP payment for imaging services was for a CT-scan, and the least OOP payment was for ultrasonography. It should be noted that the term 'state subsidies' refers to payments made in an individual's behalf by the government (Table 1).

Table 1. Average pay for various outpatient imaging services (Iranian Rial)

Source of funding	Radiology	Ultrasound	MRI	CT-scan	Total
	Mean ^a (%) ^b	n (%)	n (%)	n (%)	n (%)
Direct Payment by Patient	83128 (53)	70366 (13)	389419 (18)	422588 (16)	190105 (100)
Insurance Payment	480524 (53)	527573 (13)	480895 (18)	182842 (16)	439078
Government subsidies	14946 (53)	1137 (13)	60826 (18)	27042 (16)	23345 (100)
Total expenditure	405251 (53)	599077 (13)	926640 (18)	632472 (16)	560654

a: Mean of payment; b: Percentage of each service used by patients

The average insurance coverage provided to insured outpatients who acquired imaging services was 73% of the total charge, and the most common types of insurance among the outpatients who were insured were Social Welfare

Insurance (33%) and National Health Service (NHS) (29%). Twenty-seven percent of the patients had no insurance coverage (Figure 1). The relationship between the ages of the outpatients and the amount of their OOP payments was not significant ($p = 0.01$), i.e., the outpatients' ages had no effect on the amount of the OOP payment they were required to make for imaging services. The relationship between gender and the amount of the required OOP payments was significant ($p < 0.05$). The average OOP payment made by males was more than the average OOP payment made by females, i.e., the average for males was 286,274 Rials, and that for females was 77,210 Rials.

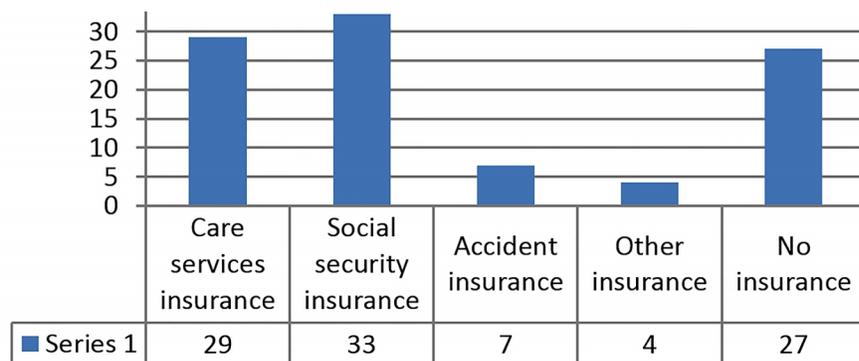


Figure 1. Types of insurance coverage among patients referred to outpatient imaging services

4. Discussion

In WHO's annual report, the worldwide average OOP percentage was about 24% in 2001, but it was 44% for the east Mediterranean region (20). This study showed that 32% of imaging expenditures paid to the hospital consisted of OOP payments. In a study conducted by Asef Zadeh in 2012, the OOP payment percentage was 45% for imaging services (11). In another study, Xu stated that Vietnam's OOP percentage of 10.5% in 1998 has shown an increasing trend through 2008 relative to the trends in other countries for the same period (21). According to Ortega-Sanchez's study in 2012, OOP payments by outpatients averaged \$178 per patient (21). WHO's 2010 report stated that, on average, 45% of the total payments for outpatient services, including physician's consulting fees, medicine, tests, and other expenditures was OOP payments made to governmental service providers. However, the ranges of OOP percentages are different in different countries. OOP payments for outpatient services at state healthcare centers comprise less than 10% of the total cost in Guatemala and Malawi, whereas they comprise more than 95% in China (23). In a study by Russell in which the relationship between OOP expenditures for healthcare and the abilities of families to afford those expenditures was assessed, their increasing affordability has had a direct and positive effect that has led to decreasing OOP payments, which shows the ascending and desirable system of health financing (24). While 75% of the resources required by Nepal's healthcare system is financed by OOP payments, only 11% of Japan's healthcare financing is dependent on this source (25). The highest backbreaking expenditures for healthcare services occur for poor populations in the area of financing medical care (23) and outpatient services. In low-income, developing countries, even a low OOP value can cause poor families to reduce their spending on healthcare as well as non-health-related expenditures (3). The high reliance on financing through OOP payments in most developing countries exposes families to the risk of unexpected expenses for healthcare services. Thus, when diseases occur, families must choose between expenditures for medical care or accepting the risk associated with the lack of treatment, which could lead to the exacerbation of the disease. Meeting medical needs could take most of families' household budgets, and this could lead to more borrowing of money or even selling their homes. This fact is effective in the reduction of household welfare (26). According to a study by Mastilica as well as WHO's 2000 report, households in the bottom deciles spend a higher share of their monthly income on medical expenditures, and they face tremendous financial pressure since their OOP payment is more than their income (27, 28).

In the current study, the highest percentage of OOP payment for outpatient imaging services was related to CT-scan, and Asef Zadeh's study made the same observation (11). In this study, the main reason for the high value of OOP payments was inadequate insurance coverage, with 27% of the outpatients having no insurance at all. In this study, the most prevalent rate of insurance coverage was among those who had social welfare insurance. This finding was the same as that of Keshavarz in 2011, who indicated that, on OOP payments for treatment, most insured customers (60%) had social welfare insurance (8). In a study by David Evan et al., the results showed that the percentage of backbreaking expenditures was very diverse among the nations and that it was exceptionally high in Latin American

countries. Three reasons could be mentioned to explain the causes of this issue, the poverty that prevented insurance payments, low affordability of individuals for OOP payments, and the availability of healthcare services related to OOP payments. The result is that low-income households should be provided assistance so they can avoid these expenditures, and such supportive policies should be considered in these nations (29).

In this study, no significant relationship was observed between the age of the outpatients and the amount of their OOP payments. However, the relationship between gender and the amount of OOP payments was significant, with males' OOP payments being more than those of females. The results of another study conducted on diagnostic services reported similar findings (11). It could be stated that financing OOP payments could make the healthcare financing system inequitable and exasperate the members of households who are trying to get medical attention for their healthcare needs. This problem affects the welfare of the entire household, and this is especially true for poor families. Similar to Semnani's study, the results of this study showed that a high percentage of treatment expenditures consist of OOP payments by the patient, and this continues to occur in spite of the attempts of healthcare policy makers to increase insurance coverage for the poor and decrease their OOP expenses for healthcare (26). To address this problem, the financing of the healthcare system should be planned in such a way that the have-nots pay less for healthcare; in addition, insurance coverage should be made available for everyone in the country. Decreasing insurance funds would result in reducing official expenditures. Furthermore, the insurers should provide suitable depth in their service coverage along with complete coverage, and they should cover different services and support vulnerable groups and the victims of accidents to a much greater extent than is being done currently. In addition, according to the results of this study, insurance companies should give special consideration to the older patients who require imaging services, and the government should provide special supportive policies concerning imaging services for older females. In addition, expensive diagnostic tests, such as the CT-scan, should address the real needs of patients by making the cost of these important diagnostic services more reasonable for everyone in our society, but especially for the poor among us.

5. Conclusions

The results of this study showed that OOP payments for outpatient imaging services amount to 32% of the total expenses associated with a CT-scan. It was found that 73% of patients had insurance coverage, and their main insurer was social welfare insurance. There was a significant relationship between gender and the amount of OOP payments, with males paying much more than females. No significant relationship was observed between the ages of patients and the amounts of their OOP payments. The practical importance of these findings provides a basis that policy makers can use to justify assigning financial resources to the healthcare sector. It is suggested that the OOP payments for all healthcare services, including diagnostic services, be investigated and evaluated for their reasonableness and fair treatment of all patients irrespective of gender and age. Conducting complementary research on imaging services in educational and private hospitals along with clinics is highly recommended for future studies in this field.

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Conflict of Interest:

There is no conflict of interest to be declared.

Authors' contributions:

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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