



# Who Uses The Health Services More? A Descriptive Study of Excessive Users' Profile and Causes

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## Abstract

**Background:** Identifying the causes of health services overutilization is an effective way of preventing misspending of insurance organizations' resources.

**Objectives:** The present study was conducted to identifying demographic factors and the causes of health services overutilization among those insured by the Iran Health Insurance Organization (IHIO).

**Methods:** The present cross-sectional study was conducted in 2017. The study population consisted of excessive users insured by IHIO in Isfahan province, of whom, 175 were randomly selected. Data obtained by the IHIO medical information system, insurance booklets and a data collection form was analyzed in SPSS-22 using descriptive statistics at a significant level of 0.05. Then, they were categorized based on their main referral cause.

**Results:** About 1.2 percent of the people insured by the IHIO in Isfahan province are among the health service over users. Participants' mean age was  $50.7 \pm 15.8$  years. Among them, 56.6 percent were female. Mean frequency of physicians' visits were  $16.3 \pm 11.7$  (more than 10 times greater than others) and the mean of paraclinical services usage was  $19 \pm 13.08$  (more than 12 times greater than others) in the first 8 months of 2017. Mean of all physicians' visits among females was  $18.47 \pm 14.7$  and means of paraclinical services usage among them was  $20.63 \pm 14.83$ . The most common causes of health services over utilization among the insured included complicated medical problems (chronic disease 47.42 percent, being elderly 17.14 percent and pregnancy 6.28 percent), health anxiety disorder (HAD) (24 percent), and administrative causes (breaking or missing papers) 2.9 percent.

**Conclusions:** According to the findings, people with complicated and chronic illness account for the majority of the over users. Others with health anxiety are in the next category. Then, identifying the over user group, their demographic characteristics, and their causative categorization can lead to a variety of solutions to suit each category. This study recommends insurance organizations to pay more attention to the service-seeking behaviors of different population groups and to consider utilization review studies as an important research approach.

**Keywords:** Health Services Utilization, Demographic Factors, Insurance, Iran Health Insurance Organization

## 1. Background

The main goal of the health system is to provide health services to various socioeconomic groups. The success of this system in achieving this goal depends on two factors: The quality of services, and people benefiting from these services. However, health systems are faced with some problems such as limited resources and rising expenses to carry out this responsibility (1-3). However, due to various reasons, such as demographic and epidemiological changes, increased awareness, education and train-

ing, new technologies, increasing family income and consequently high demand for health services and inability of countries to increase health resources with the same speed, no country can provide all health costs (4).

There are several factors involved in the rising health system expenses, including the expanding medical technology, the growing phenomenon of aging, and increasing non-communicable diseases. This effect becomes more tangible when people have increasing access to services (5, 6).

Iran's Health system has experienced various reforms

over time; the last one but not the least was the health transformation plan (HTP) initiated in May 2014, with approaches to financial protection, increased access to health services through increasing insurance coverage and improvement of service quality. In spite of the short lifetime of this plan, several studies have suggested that the plan has succeeded in reducing the patients' out of pocket expenses in public hospitals and expanding health insurance coverage. Therefore, the overall accessibility to health services has increased. While the results show an increase in the frequency of admissions in clinics, paraclinics, and hospitals after HTP (7), the positive effect of insurance coverage on health services utilization, pave the way for some behavioral change in users and providers of health services. Hence, to control resources, insurance organizations use various methods to control and assess the behavior of healthcare providers and patients covered by them (8-10). One of the methods to control the behavior of healthcare providers is the different ways of payments to healthcare providers that are calculated differently according to provider performance, type of department and department income (11).

Among these methods, investigating the treatment-seeking behaviors of the insured and identifying factors affecting these behaviors can be effective. According to importance of this subject, some previous studies were conducted to reveal the numerical and economic size of the health services provided for people in hospitals. For example, Akbulut et al. in their study tried to declare the numerical costs of free preventive and emergency services provided for Syrian refugees in Turkey according to utilization data. They showed that the number of births was 103347, deaths 3460, operations 260212, emergency and outpatients 8849518, and inpatients 252470 in 2014 to 2015. Total health spending for the public hospitals was approximately \$ 338392896 in the same years for Syrian refugees in Turkey (12).

Accordingly, people exhibit different behaviors when faced with symptoms of illness and feel the need for medical services, including correct or unusual treatment-seeking behaviors. Some people refrain from physicians' visits and others use more and more medical and paraclinical services to ensure their health status. Therefore people who overuse health services impose high costs on themselves and the organization (13).

The Institute of Medicine committee defined overutilization as the use of health care resources and procedures in the absence of evidence that the service could help the patients subjected to them. Health services overutilization is a problem that affects both quality and cost of care and plays a significant role in reducing the health system performance and recourses misspend. Health services

overutilization occurs from the various public to specialized medical services. Therefore, identification and analysis of its causes can be helpful to prevent and remedy health services overutilization (14, 15).

Previous studies have shown that various factors affect treatment seeking behavior and frequency of medical services used. In his study, Jung listed these factors as access to insurance, income, and cost of physicians' visit (16), and Haileamlak listed them as household socioeconomic status, education, residential area, and insurance (17). Kim and Lee considered gender, age, marital status, education, infection with non-communicable diseases, and insurance as factors affecting the frequency of visits to receiving health services (18). Identifying these factors and their effect on the utilization of health services, especially in the insured who use these services more than others is vitally important for the insurance organizations responsible for the protection of the insured against financial risks, and which yet have limited resources (19, 20).

The IHIO covers various groups of Iranian people, most of them are civil servants. This organization can control health expenses by controlling and adjusting the treatment-seeking behavior of the insured. Therefore, knowledge of factors affecting the health services' utilization and the causes of health services overutilization among the insured are essential to control and adjustment of the behavior of users, especially the insured people with excessive utilization (16, 21).

## 2. Objectives

The present study was conducted to identify the demographic factors and the causes of health services overutilization among the insured by the IHIO in Isfahan province in 2017.

## 3. Methods

The present cross-sectional study with applied results was conducted in 2017. The study population consisted of those people insured by IHIO in Isfahan province (1500000 individuals in 2017). The study inclusion criteria were insurance coverage by IHIO in 2017, with finished insurance booklets before three months. The exclusion criteria were the unwillingness to take part in the survey. The sample size was determined as 114 cases using the Cochran formula as below:

$$p = \frac{1500 \times 12}{1500000} = 0.012 \quad (1)$$

$$d = 0.02$$

$$q = 1 - 0.012 = 0.988 \quad (2)$$

$$n = \frac{4 \times 0.012 \times 0.988}{0.02 \times 0.02} = 114 \quad (3)$$

- p = the number of insured people whose insurance booklets had ended before time was 18000 per year (1.2 percent)

- Z = 2, (95 percent confidence)

- d = 2 percent accuracy rate

- n = 114

With probable loss in mind, 200 cases were examined, reaching 175 cases at the end.

The researcher studied all the cases, who came to the IHIO office to change their insurance booklets (which was ended before time) in random days of the weeks. Data were collected from the information system of IHIO in Isfahan province, insurance booklets, and the insured individuals or their companions. The study tools included a data collection form including date, type, and frequency of consuming services (physician visits, pharmacy, laboratory, imaging, hospitalization, etc.) from April to October 2017. Afterwards, they were categorized based on their main referral cause.

Descriptive statistics were entered into SPSS-22 (at a significant level of 0.05) to describe demographic factors, the number of physicians' visits, paraclinical services usage, and the frequency of each overutilization cause.

In order to comply with the principle of confidentiality, the name of the insured was not recorded. Instead, a code was assigned to each of them to identify the insured. They were also assured that their information was used only for research purposes and if they did not want to cooperate, they would be excluded from the research. The ethical code of the study was IR.mui.REC.1396.2.041.

#### 4. Results

Participants' mean age was  $50.7 \pm 15.8$  years, 56.6 percent were female and the rest were male. Mean duration for the insured booklets to finish was  $60.1 \pm 18.1$  days. Based on the participants' type of insurance funds, 31.4 percent was under the coverage of universal coverage fund. The mean number of all physicians' visits among males was  $18.47 \pm 14.7$  and mean of paraclinical services usage among them was  $20.63 \pm 14.83$ . Mean of all physicians' visits and means of paraclinical services usage in different demographic groups is shown in Table 1.

Mean number of various physicians' visits (including GP, specialty and subspecialty physicians) over the April to October 2017 was  $16.3 \pm 11.7$  times, and mean of paraclinical services usage (including imaging, pharmacy, and laboratory) was  $19 \pm 13.08$  times. Also, participants had been

hospitalized once on average. Mean burden of visits of people insured by the IHIO in Isfahan province in 2017 was also extracted for better comparison (Table 2).

The causes of health services overutilization among the insured were categorized. The most common cause of health services overuse was complicated medical problems (70.84 percent) and its sub-categories were:

- chronic disease (cancers, cardiovascular diseases, diabetes, etc.) 47.42 percent

- elderly (age over 60 years) 17.14 percent

- pregnancy 6.28 percent

The second cause of health services overutilization was related to those people who had excessive worry about their health status (health anxiety) (24 percent). They continue to visit different doctors even when they give enough assurance and to do more and more medical tests, despite negative results. The other cause of health services overuse was the administrative cause (5.16 percent) (Table 3).

#### 5. Discussion

The assessment of physicians' visits by gender among the outpatient group showed that although there were fewer men who participated than women, they had more physicians' visits on average. The utilization of paraclinical services was also higher among men compared to women. The results of a study by Heydar Niya et al. about the burden of physicians' visits and the health services utilization suggested that men used more health services than women (22). However, Kapoor and Thorn did not see any significant effect of gender on health services utilization in their study (23). Borhaninejad et al. found that women were using health services more than men. They justified that perhaps this increase was due to the lower level of health among women, or the greater sensitivity of women toward their health status. Nevertheless, Rezapour et al. in their study showed that women in some areas, due to religious and ethnicity, still, refuse to use some health services or to visit non-homogeneous physicians (24, 25).

Considering that excessive users in this study had different levels of education, the burden of physicians' visits and paraclinical services utilization were compared regarding the levels of their education. Findings showed that illiterates used more paraclinical services and more specialist visits compared to the other excessive users. The effect of literacy on the health services utilization among the insured (not excessive users) is discussed in some other studies. Kim et al. and Barnett concluded that higher education reduces the overall utilization of health services by raising awareness and reinforcing their attitudes toward the proper use of health services (2, 18). Fernandez et al. showed that higher education level would reduce the need

**Table 1.** Insurance Details, Burden of the Visits and the Usage of the Paraclinical Services According to Participants' Demographic Items

Variable	Values	Minimum	Maximum	Mean of All Physicians' Visits	Mean of all Paraclinical Services Usage
Age, y	50.7 ± 15.8	6.5	89		
Ending time of the insurance booklet, d	60.1 ± 18.1	14	90		
<b>Gender</b>					
Female	99 (56.6)			18.47 ± 14.7	20.63 ± 14.83
Male	76 (43.4)			14.74 ± 8.55	17.74 ± 11.48
<b>Education</b>					
Illiterate	27 (15.4)			18.7 ± 11.46	22.4 ± 14.65
Primary to secondary school	65 (37.1)			18.18 ± 12.45	19.67 ± 12.86
Diploma to a bachelor's degree	76 (43.4)			14.42 ± 11.22	17.68 ± 12.88
Bachelor' degree and higher	7 (4)			11.57 ± 7.78	13.85 ± 9.15
<b>Type of insurance fund</b>					
Universal coverage Fund	58 (33.1)			14.23 ± 9.46	15.8 ± 10.47
Civil Servants Fund	48 (27.4)			11.97 ± 8.09	17.66 ± 12.56
Rural and Nomads Fund	14 (8)			9.35 ± 4.43	11.71 ± 6.56
Other Social Strata Fund	55 (31.4)			23.70 ± 13.77	24.89 ± 14.79

<sup>a</sup>Values are expressed as mean ± SD or No. (%).

**Table 2.** Burden of Visits of All the Insured People by IHIO in Isfahan Province and Participants

Variable	Service Consumption by the Study Participants	Service Consumption by All People the Insured
	Mean (over the April to October 2017)	Mean (2017)
GP	5.06 ± 6.2	1.51
Specialist	9.2 ± 8.3	1.12
Subspecialty	2.06 ± 4.06	0.31
Pharmacy	13.2 ± 10.7	2.15
Laboratory	3.4 ± 4.1	0.46
Imaging	2.2 ± 2.2	0.33
All physicians	16.3 ± 11.7	2.94
All paraclinics	19.0 ± 13.08	2.95
Hospitalization	0.92 ± 1.09	0.1

for health services and consequently, reduce the health services utilization (26). There are various interpretations of the impact of education on health services utilization. From another point of view, it can be said that higher education increases the level of health services utilization by creating more awareness and more sensitivity to physical or mental symptoms (13).

The subjects of this study were covered by various insurance funds of the IHIO. These funds include the “universal coverage Fund”, “Civil Servants Fund”, “Rural and Nomads Fund” and “Other Social Strata Fund”. Findings

showed that those insured by other social strata and universal coverage plan had used health services more than others. With the launch of the HTP, efforts to expand coverage for non-insured individuals have been intensified by the creation of a universal coverage fund in IHIO (27). Therefore, it is possible that higher health services utilization among individuals covered by this insurance fund are due to uncontrolled use of health services, and failure to comply with the referral system.

According to categorizing excessive healthcare users, the major category belonged to complicated health con-

**Table 3.** Causes of Health Services Overutilization Among the Insured People

Causes of Health Services Overutilization/Sub-Clauses	Frequency	Valid Percent
<b>Complicated medical problems</b>		
Chronic disease	83	47.42
Elderly (over 65 years old)	30	17.14
Pregnancy	11	6.28
<b>Health concerns</b>		
Probably health anxiety disorder	42	24
<b>Administrative causes</b>		
Breaking or missing insurance booklet papers	5	2.9
Prescribing duplicate tests by physicians	1	0.6
Provider misuse of insurance booklet (separating extra sheets)	1	1.66

ditions. Cancers, various types of non-communicable diseases (NCD) including diabetes and cardiovascular disease, elderly and risky periods of life such as pregnancy, childbirth and its complications, were the most important factors. Although we did not find any study addressing the causes of health services overutilization, various studies in other ways, showed the impact of NCD and elderly on health services utilization. For example, a study by Lu in Taiwan and another one by Celik and Hotchkiss indicated that older people used more health services and that their annual cost of admission and outpatient care was higher than the other age groups (28, 29). The study of Zandi et al. showed that 28.7 percent of the cost of hospitalized patients was in the elderly, which is much higher than those of other age groups. Regarding caring for elderly people, it should be noted that they need more care than younger people. When this care is not taken efficiently, the use of health services increases (30).

Based on the results of other studies, NCDs can change the pattern of health care utilization (31). The findings of the study by Treanor and Donnelly indicated that people with cancer are more likely to use specialized outpatient services than others (32). The findings of Nooraiee Motlagh et al. and Atwine and Hjelm regarding the effect of insulin-dependent diabetes mellitus on health care utilization, showed that this group used many clinical and para-clinical services more in comparison to healthy people (19, 33).

People have different treatment-seeking behaviors in the face of health issues. Some people refer to different physicians when they feel any symptoms of their illness in order to get better health outcomes. This sensitivity may not lead to the desired outcome (17). In addition, guiding people with chronic disease can be helpful in choosing the right services they need. Some known solutions such

as adopting family physicians and using a referral system could be effective and helpful.

One other important cause of health services overutilization was the individual's concerns about their health status. Health anxiety disorder (HAD) is a condition in which a person frequently visits physicians to ensure his/her health and uses multiple diagnostic tests (34). A study by Bobevski et al. reveals that HAD led to overutilization of services, and people with HAD are more likely to use medical services than others (35). Also, the findings of the Fink study about HAD outcomes showed that people with HAD typically use more health services. Therefore, the diagnosis and treatment of HAD in the early stages can significantly help to treat it and to control the health services expenditures (36).

Lack of prior similar studies to compare with, and also unavailability of the other insured people who used health care services normally, to compare their health services utilization with over users insured were the limitations of this study.

### 5.1. Conclusions

According to the findings, about 1.2% of the insured people in the IHIO in Isfahan province are among the health service over users. The frequency of referrals to physicians for this group is more than 10 times greater than others. This relation is greater than 12 times in para-clinical services and more than 18 times in hospital admission. People with complicated and chronic illness account for the majority of the over users. Others with health anxiety are in the next category. These findings further remind the attention to the over user group.

The paradox of health coverage and overuse is well known in all insurance organizations. Identifying the over user group, their demographic characteristics and



their causative categorization can lead to a variety of solutions to suit each category. In this context, further studies should be undertaken to identify people with various socioeconomic situations, who use health services more than the others. This is a necessary approach for the insurance organizations to guide individuals for the proper use of health services, and to control costs.

Considering the importance of the insured's service-seeking behaviors and their impact on the resources, the present study recommends insurance organizations to pay more attention to the service-seeking behaviors of different population groups and to consider utilization review studies as a research priority.

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## Footnotes

**Authors' Contribution:** Masoud Ferdosi: designing and conducting the project. Mohammadreza Rezayatmand: designing the manuscript. Abbas Feizbakhsh: data collection. Hamid Reza Dehghani: data collection and analysis. Golnoosh Aghili: writing the manuscript.

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