

Utilization and cost of outpatient services: A cross-sectional study on the Iran Health Insurance Organization insurees in Fars province

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Abstract

Background and Aims: Analyzing the utilization of health services is necessary for allocating the resources and planning the provision of health services. The present study aimed at investigating the utilization and cost of outpatient services and the factors affecting it among the insurees of the Iran Health Insurance Organization in Fars province in 2019.

Methods: The study population consisted of all Iran Health Insurance Organization insurees in Fars province in 2019 ($n = 2,618,973$). The data on the utilization and cost of the services were extracted from the information systems of Fars Health Insurance Organization. The descriptive statistics of the utilization and cost of outpatient services were provided by gender, age, and type of insurance fund. The effects of different factors on the utilization and cost of various services were also investigated using univariate analysis as well as cross-sectional regression. The data analysis was done using EXCEL and STATA 15 software as well.

Results: The average utilization rates of laboratory, drug, and radiology services were 0.940, 0.945, and 0.108 prescriptions per year, respectively. In addition, the mean costs of laboratory, drug, and radiology services were \$1.13, \$7.44, and \$2.26 per year, respectively. The univariate and multivariate analyses showed that gender, type of insurance fund, and age had significant effects on the utilization and costs of laboratory, drug, and radiology services ($p < 0.05$).

Conclusion: The utilization and expenditure of outpatient services were higher among the elderly and women. To control the costs of insurance organizations, it is helpful to identify the effective factors. In addition, due to the increasing trend of aging in Iran, it seems necessary to periodically monitor the pattern of the elderly people's utilization of health services and to plan to increase sustainable resources for insurance financing in the coming years.

Ali Mohammadi and Farhad Lotfi had equal participation as the first author and we would like to consider both as co-first authors.

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KEYWORDS

drug utilization, health care costs, health services, insurance

1 | INTRODUCTION

Access to health care as a main intermediate goal of health system, plays a major role in moving countries toward Universal Health Coverage (UHC).¹ Access to quality health as well as diagnostic and treatment services is one of the most important strategies to achieve the Millennium Development Goals (MDGs), and equal access of different socioeconomic groups to health care is among of the main goals of health systems.² Availability (physical access), ability to pay or affordability (financial access), and acceptability (cultural access) constitute the three main dimensions of access.³

Measuring access to health care is complex and hard, so in practice utilization or consumption of health services as proxy for access is used.⁴ Utilization of health services is an important issue in health policies, and is defined as the meeting of the supply and demand sides of health care.⁵ It includes doctor's visit, hospital stay, and use of other medical goods and services including provision of medicine and rehabilitation services.⁵ Utilization will be realized if, first, the supply of required services is done, and second, people can and want to use the available services. Today, utilization analysis plays an important role in planning for the proper supply of health services in the community,⁶ and given that management of the health system and good planning depend on informed decisions, having the knowledge and understanding of utilization of health services for allocation of resources and health planning seems necessary.⁷ The lack of proper utilization of health services has been a major concern of policymakers, especially in developing countries.^{8–11}

Considering the importance of access to health services, various studies have been conducted in different countries to investigate the levels of utilization and the factors affecting it. The studies have examined numerous economic, social, and cultural factors affecting utilization of health services. Aging, heads-of-household women, economic status, education of the head of the household, having under-12-year-old family members, age, gender, marital status, region, chronic diseases, and insurance coverage were among the factors addressed in previous studies.^{12–15} In a recent study in Iran, it was indicated that gender, location and income were the main factors explaining differences in access to primary health care.¹⁶

Although several studies have been conducted in the field of health service utilization in Iran, there is very little study with a large sample size that provides precise and valid evidence in this field. So, the present study aimed at examining the utilization and cost of outpatient services and the factors affecting them among the more than 2.6 million insurees of Iran Health Insurance Organization (IHIO) in Fars province in 2019.

2 | METHODS

In this cross-sectional study, the study population included all the insurees of IHIO in Fars province in 2019 with complete data ($n = 2,618,973$), all of whom were selected.

The IHIO was established with the aim of achieving fair coverage of services, reducing people's payments, eliminating insurance overlap, and expanding the family physician program and referral system. This organization has five insurance funds as follows: the fund of the civil servants, universal health insurance funds, Iranian (self-insured) fund, rural fund, and the other social strata fund. Total number of insurees of this organization in Iran and Fars province was more than 40 million and 2,685,964 people, respectively.¹⁷

The data on the utilization and cost of services were extracted from the information systems of IHIO of Fars province. The required data were collected using a researcher-made data collection form. It should be noted that total cost of services, insurer plus patient cost, was gathered and included in analysis.

First, the descriptive statistics of the utilization and cost of outpatient services, including medicine, radiology, and laboratory, were calculated by gender, age, funds among insurees of IHIO in Fars province in 2019. Then, the effects of gender, age, and type of insurance fund on the utilization and cost of different services were investigated using univariate analysis as well as cross-sectional

TABLE 1 Frequency of demographic factors in the IHIO insurees in Fars province.

| Variables | | Frequency (percent) |
|-----------------|----------------------------|---------------------|
| Gender | Female | 1376490 (48.84) |
| | Male | 1441632 (51.16) |
| Insurance funds | Iranian (self-insured) | 53455 (1.90) |
| | Universal health insurance | 652052 (23.14) |
| | Rural | 1603661 (56.91) |
| | Civil servants | 351588 (12.48) |
| | Other social strata | 157366 (5.58) |
| Age groups | <5 | 177961 (6.31) |
| | 6–20 | 618441 (21.95) |
| | 21–35 | 726375 (25.78) |
| | 36–50 | 664852 (23.59) |
| | 51–65 | 385971 (13.70) |
| | >65 | 244502 (8.68) |
| All | | 2618973 (100) |

Abbreviation: IHIO, Iran Health Insurance Organization.

TABLE 2 Utilization of laboratory, medicine, and radiology services based on other factors in the IHIO insurees in Fars province.

| Variables | | Mean | Standard deviation | p Value |
|----------------------------------|----------------------------|--------|--------------------|-------------|
| Outpatient services | Laboratory (prescription) | 0.940 | 5.481 | |
| | Medicine (prescription) | 0.945 | 3.283 | |
| | Radiology (prescription) | 0.108 | 0.537 | |
| <i>Laboratory (prescription)</i> | | | | |
| Gender | Female | 1.119 | 5.936 | $p < 0.001$ |
| | Male | 0.693 | 4.995 | |
| Insurance funds | Iranian (self-insured) | 2.365 | 11.320 | $p < 0.001$ |
| | Universal health insurance | 0.691 | 3.714 | |
| | Rural | 0.693 | 4.249 | |
| | Civil servants | 2.541 | 8.893 | |
| | Other social strata | 1.969 | 8.203 | |
| Age groups | <5 | 0.420 | 2.686 | $p < 0.001$ |
| | 6–20 | 0.355 | 2.850 | |
| | 21–35 | 0.594 | 4.204 | |
| | 36–50 | 0.919 | 5.180 | |
| | 51–65 | 1.903 | 8.136 | |
| | >65 | 2.365 | 9.249 | |
| <i>Medicine (prescription)</i> | | | | |
| Gender | Female | 1.183 | 3.656 | $p < 0.001$ |
| | Male | 0.719 | 2.863 | |
| Insurance funds | Iranian (self-insured) | 1.889 | 5.254 | $p < 0.001$ |
| | Universal health insurance | 0.976 | 1.928 | |
| | Rural | 0.437 | 2.381 | |
| | Civil servants | 2.465 | 5.042 | |
| | Other social strata | 2.746 | 6.535 | |
| Age groups | <5 | 0.797 | 2.373 | $p < 0.001$ |
| | 6–20 | 0.370 | 1.543 | |
| | 21–35 | 0.501 | 2.033 | |
| | 36–50 | 0.858 | 3.105 | |
| | 51–65 | 1.897 | 4.911 | |
| | >65 | 2.565 | 4.911 | |
| <i>Radiology (prescription)</i> | | | | |
| Gender | Female | 0.134 | 0.593 | $p < 0.001$ |
| | Male | 0.083 | 0.477 | |
| Insurance funds | Iranian (self-insured) | 0.358 | 0.584 | $p < 0.001$ |
| | Universal health insurance | 0.539 | 0.456 | |
| | Rural | 0.750 | 0.746 | |
| | Civil servants | 0.650 | 0.917 | |
| | Other social strata | 0.853 | 0.240 | |
| Age groups | <5 | 0.0215 | 0.192 | $p < 0.001$ |

(Continues)

TABLE 2 (Continued)

| Variables | Mean | Standard deviation | p Value |
|---|-------------------|--------------------|---------|
| 6–20 | 0.0407 | 0.296 | |
| 21–35 | 0.068 | 0.392 | |
| 36–50 | 0.116 | 0.545 | |
| 51–65 | 0.231 | 0.818 | |
| >65 | 0.243 | 0.837 | |
| Utilization rate based on frequency (percent) | Yes | No | |
| Laboratory | 153996 (5.88) | 2464977 (94.12) | |
| Medicine | 485820 (18.55) | 2133153 (81.45) | |
| Radiology | 169710 (6.48) | 2449263 (93.52) | |

Abbreviation: IHIO, Iran Health Insurance Organization.

econometric models. In the multivariate analysis, linear regression was used for the cost variable. However, since utilization was a count variable, the count data regression was used. Significance level was considered as $p < 0.05$.

For converting Iranian Rial to USD, the exchange rate reported by the central bank of Iran in 2019 was used (1 USD = 42,000 IRR).¹⁸ It should be noted that this rate is government exchange rate. The free market exchange rate (1 USD = 1,29,183 IRR) was higher than it in 2019. Moreover, for international comparison, purchasing power parity (PPP) is more useful. Therefore, in the findings section, the overall numbers of costs (not the details of costs in tables) were also reported in the form of free market based USD and PPP (1 PPP = 21,535 IRR, based on world bank PPP conversion factor data¹⁹). The data analysis was done using the EXCEL and STATA 15 software. The protocol of current research was confirmed by ethics committee of Shiraz University of Medical Sciences with code IR.SUMS.REC.1399.1182.

3 | RESULTS

Of all the insurees, 1,376,490 (48.84%) were female and the rest were male. Considering the type of fund, rural fund ($n = 1,603,661$, 56.91%) accounted for the highest number of insurees, and Iranians fund ($n = 53,455$, 1.90%) accounted for the lowest. Most of the insurees were aged 21–35 years ($n = 726,375$, 25.78%) and the lowest number of them was in the age group of <5 years ($n = 177,961$, 6.31%) (Table 1). According to Table 2, the mean utilization of laboratory, drug, and radiology services were 0.940 test prescriptions, 0.945 drug prescriptions, and 0.108 radiology prescriptions, respectively. In terms of frequency, 5.88% of population

($n = 153,996$) have utilized laboratory services. Moreover, 18.55 ($n = 485,820$) and 6.48 ($n = 169,710$) percentage of insurees have consumed medicine and radiology services, respectively.

The results of the mean difference showed that the utilization of different services was significantly higher in women than in men (1.199 vs. 0.693 laboratory test prescriptions, 1.183 vs. 0.719 drug prescriptions, and 0.134 vs. 0.083 radiology prescriptions). There was also a significant difference between the mean utilization of different services by different insurance funds. Regarding all services, the highest mean utilization rates were related to the age group over 65-year-old (2.365 laboratories, 2.565 drugs, and 0.243 radiology prescriptions).

The mean costs of laboratory, drug, and radiology services were \$1.13 (0.37 free market\$, 2.2 PPP), \$7.44 (2.42 free market\$, 14.51 PPP), and \$2.26 (0.73 free market\$, 4.41 PPP), respectively. The univariate analysis showed that the mean costs of different services were significantly higher among the women compared to the men. The mean cost of services by insurance funds showed a significant difference as well. The highest mean cost was that of the age group over 65-year-old (Table 3).

According to the regression results (Table 4), gender (female), type of insurance fund, and age (old age) had significant effects on the utilization and cost of laboratory, drug, and radiology services among the insurees of the IHIO in 2019 ($p < 0.01$) (Table 5).

4 | DISCUSSION

In the present study, the mean utilization of laboratory, drug, and radiology services included 0.940 test, 0.945 drug, and 0.108 radiology prescriptions, respectively. Hassanvand et al. in Lorestan

TABLE 3 Cost of laboratory, medicine, and radiology services based on other factors in the IHIO insurees in Fars province.

| Variables | | Mean | Standard deviation | p Value |
|----------------------------------|----------------------------|-------|--------------------|-------------|
| Outpatient services | Laboratory (prescription) | 1.13 | 650.5320 | |
| | Medicine (prescription) | 7.44 | 12400000 | |
| | Radiology (prescription) | 2.26 | 1545290 | |
| <i>Laboratory (prescription)</i> | | | | |
| Gender | Female | 1.47 | 353589.97 | $p < 0.001$ |
| | Male | 0.81 | 285019.04 | |
| Insurance funds | Iranian (self-insured) | 2.95 | 654149.48 | $p < 0.001$ |
| | Universal health insurance | 0.68 | 255142.67 | |
| | Rural | 0.75 | 263666.65 | |
| | Civil servants | 2.92 | 478274.49 | |
| | Other social strata | 2.22 | 431146.61 | |
| Age groups | <5 | 0.43 | 166848.35 | $p < 0.001$ |
| | 6–20 | 0.41 | 178999.96 | |
| | 21–35 | 0.81 | 282936.83 | |
| | 36–50 | 1.22 | 338236.85 | |
| | 51–65 | 2.17 | 443693.61 | |
| | >65 | 2.53 | 462679.33 | |
| <i>Medicine (prescription)</i> | | | | |
| Gender | Female | 8.73 | 16097688 | $p < 0.001$ |
| | Male | 6.20 | 7282602.5 | |
| Insurance funds | Iranian (self-insured) | 63.27 | 28213037 | $p < 0.001$ |
| | Universal health insurance | 3.46 | 4427011.1 | |
| | Rural | 4.26 | 5639055.1 | |
| | Civil servants | 15.28 | 7508095 | |
| | Other social strata | 19.82 | 44140046 | |
| Age groups | <5 | 1.43 | 4156269.6 | $p < 0.001$ |
| | 6–20 | 3.40 | 4802754.8 | |
| | 21–35 | 6.68 | 9182679.8 | |
| | 36–50 | 9.55 | 22265514 | |
| | 51–65 | 11.60 | 6807653.2 | |
| | >65 | 11.95 | 5362150.8 | |
| <i>Radiology (prescription)</i> | | | | |
| Gender | Female | 2.93 | 1692133.3 | $p < 0.001$ |
| | Male | 1.62 | 1390153.4 | |
| Insurance funds | Iranian (self-insured) | 6.36 | 3547856.4 | $p < 0.001$ |
| | Universal health insurance | 1.54 | 1285800.8 | |
| | Rural | 1.45 | 1203809.5 | |
| | Civil servants | 5.69 | 2380613.7 | |
| | Other social strata | 4.38 | 2031571 | |
| Age groups | <5 | 0.18 | 123974.59 | $p < 0.001$ |

(Continues)

TABLE 3 (Continued)

| Variables | Mean | Standard deviation | p Value |
|-----------|------|--------------------|---------|
| 6–20 | 0.41 | 454488.15 | |
| 21–35 | 1.09 | 809051.18 | |
| 36–50 | 2.38 | 1484037.4 | |
| 51–65 | 5.50 | 2496139.4 | |
| >65 | 6.45 | 3021945.4 | |

Abbreviation: IHIO, Iran Health Insurance Organization.

TABLE 4 Regression estimates of factors affecting utilization of laboratory, medicine, and radiology services in the IHIO insurees in Fars province.

| Independent variables | | Laboratory | | Medicine | | Radiology | |
|-----------------------|----------------------------|-------------|---------|-------------|---------|-------------|-------------|
| | | Coefficient | p Value | Coefficient | p Value | Coefficient | p Value |
| Gender | Female | Reference | | | | | |
| | Male | 0.028 | 0.000 | -0.466 | 0.000 | -0.366 | $p < 0.001$ |
| Insurance funds | Iranian (self-insured) | Reference | | | | | |
| | Universal health insurance | -0.427 | 0.000 | -1.316 | 0.000 | -0.811 | $p < 0.001$ |
| | Rural | -0.348 | 0.000 | -1.096 | 0.058 | -1.054 | $p < 0.001$ |
| | Civil servants | -0.256 | 0.000 | -0.026 | 0.000 | -0.0002 | $p < 0.001$ |
| | Other social strata | -0.233 | 0.000 | 0.148 | 0.000 | -0.099 | $p < 0.001$ |
| Age groups | <5 | Reference | | | | | |
| | 6–20 | 0.270 | 0.000 | -0.930 | 0.000 | 0.552 | $p < 0.001$ |
| | 21–35 | 0.368 | 0.000 | -0.652 | 0.000 | 1.082 | $p < 0.001$ |
| | 36–50 | 0.468 | 0.000 | -0.281 | 0.000 | 1.497 | $p < 0.001$ |
| | 51–65 | 0.644 | 0.000 | 0.312 | 0.000 | 2.014 | $p < 0.001$ |
| | >65 | 0.679 | 0.000 | 0.608 | 0.000 | 2.062 | $p < 0.001$ |
| Model significance | LR χ^2 | 9462.38 | 0.000 | 148603.49 | 0.000 | 92176.14 | $p < 0.001$ |

Abbreviation: IHIO, Iran Health Insurance Organization.

found out that the utilization rate (at least one referral to a medical center) for medical imaging center, pharmacy, and laboratory during the last 3 months was 33.6%, 35.9%, and 54.8%, respectively.²⁰ Ebadifard Azar in Isfahan showed that the average utilization rates of pharmaceutical and outpatient diagnostic services were 2.52 and 1.32, respectively.⁶ The findings of the study by Jakovljević in Serbia reported that a total of 20,117 patients in 2007, 17,436 patients in 2008, 19,996 patients in 2009, and 17,579 patients in 2010 had used radiology services.²¹ Doroh and colleagues in Shiraz showed that the average use of outpatient services was 2.66 with a standard deviation of 3.07 and the annual average was 31.92. Furthermore, among the outpatient services studied, pharmacies and emergency departments accounted for the highest (1.40) and the lowest (0.01) mean values, respectively.²² As observed, the utilization rates reported in different studies were different, the reason for which could be attributed to the time frames of the studies, the study locations, the study populations, differences in demographic characteristics of the study populations, and the units of utilization measurement. For example, in

the present study, the unit of utilization measurement was the average number of prescriptions per year, while in other studies, the number of items was probably considered. In addition, the services purchased by the patients outside of the insurance obligations were not considered in this study.

This difference in service consumption can lead to a difference in costs, because costs are obtained by multiplying the amount of consumption by the price of the service. For example, in Ebadifard Azar's study, the high consumption rate compared to the current study is one of the reasons for the higher costs in that study compared to the current study (6). In the next paragraph, studies are discussed from the perspective of costs.

The average costs of laboratory, medicine, and radiology services were \$1.13, \$7.44, and \$2.26, respectively. The results of Ebadifard Azar's study in Isfahan showed that the mean cost of receiving medical services in Nayin city was 366,296 Rials (\$8.72), while the cost of receiving medical services in other cities was estimated at 454,585 Rials (\$10.82).⁶ In Serbia, Jakovljević showed that on

TABLE 5 Regression estimates of factors affecting cost of laboratory, medicine, and radiology services in the IHIO insurees in Fars province.

| Independent variables | | Laboratory | | Medicine | | Radiology | |
|-----------------------|----------------------------|-------------|---------|-------------|---------|-------------|-------------|
| | | Coefficient | p Value | Coefficient | p Value | Coefficient | p Value |
| Gender | Female | Reference | | | | | |
| | Male | -24101.27 | 0.000 | -89105.50 | 0.000 | -47664.02 | $p < 0.001$ |
| Insurance funds | Iranian (self-insured) | Reference | | | | | |
| | Universal health insurance | -88955.98 | 0.000 | -2493530 | 0.000 | -183029.3 | $p < 0.001$ |
| | Rural | -88787.88 | 0.000 | -2467719 | 0.000 | -195977.3 | $p < 0.001$ |
| | Civil servants | -13351.32 | 0.000 | -2050216 | 0.000 | -71481.2 | $p < 0.001$ |
| | Other social strata | -39733.4 | 0.000 | -1852357 | 0.000 | -115625.4 | $p < 0.001$ |
| Age groups | <5 | Reference | | | | | |
| | 6-20 | -4565.719 | 0.000 | 73684.16 | 0.027 | 4477.085 | 0.28 |
| | 21-35 | 12780.92 | 0.000 | 186043.4 | 0.000 | 32669.7 | $p < 0.001$ |
| | 36-50 | 26461.99 | 0.000 | 299078.7 | 0.000 | 81337.8 | $p < 0.001$ |
| | 51-65 | 53351.51 | 0.000 | 295924.1 | 0.000 | 192163.5 | $p < 0.001$ |
| | >65 | 65285.42 | 0.000 | 277857.9 | 0.000 | 227032.7 | $p < 0.001$ |
| Model significance | F statistic | 4999.11 | 0.000 | 296.55 | 0.000 | 1245 | $p < 0.001$ |

Abbreviation: IHIO, Iran Health Insurance Organization

average, radiology services cost \$100–300 per patient.²¹ The discrepancy between the costs in different studies was due to the aforementioned factors that also caused differences in the calculation of utilization. One of the reasons for such a discrepancy is that in the present study, the mean utilization and cost were calculated for the entire population (either the ones who had used the services or those who had not), but in many other studies, for example, Ebadifard Azar's study in Isfahan, the mean value was estimated only for the people who had used the services.

In this study, the mean rates of utilization and cost of laboratory, drug, and radiology services were higher among women than men, and based on the regression results, the insuree's gender had a significant effect on the utilization and cost of these services. Tajvar et al.²³ in Iran suggested that the need for outpatient services had a significant relationship with gender. Another study in Iran reported that the use of outpatient services by women was 1.7 times that of men.²⁴ A study on the adults over 50 years of age in China, Ghana, India, Mexico, Russia, and South Africa concluded that elderly women used outpatient services more than men.²⁵ A study in America showed that women paid more expenses compared to their income to receive outpatient services than men did.²⁶ Morovatisharifabad et al.²⁷ in Yazd indicated that women benefited from outpatient services 59.9% more than men. Other studies suggested that on average, women had utilized more services than men,^{22,27–30} which is consistent with the findings of the present study. Several reasons have been suggested for women's greater use of outpatient services, including their higher sensitivity to their own health compared to men, and paying more attention to early signs and symptoms of illnesses. However, men sought medical care when their illnesses had

reached a critical stage.^{23,24,31,32} On the other hand, some studies reported no significant relationship between the utilization of different health services and gender, and the use of elderly men was greater than women.^{15,20,33–35}

The average utilization and cost of laboratory, drug, and radiology services in the age group over 65 years was higher than all other age groups. According to the regression results, age had a significant effect on the utilization and cost of laboratory, medicine, and radiology. Tajvar et al.²³ found out that the need for outpatient services in Iran had a positive relationship with age. A study conducted on the adults over 50 years of age in China, Ghana, India, Mexico, Russia, and South Africa showed that the need for utilization of health services increased with age.^{22,25} Furthermore, the relationship between old age and increased utilization and cost of health services were approved in other studies,^{22,27–30} the clear reason for which was the greater need of these groups for health services. According to epidemiological studies, age was one of the determining factors in the distribution and occurrence of diseases, and the prevalence of chronic diseases was higher in adults than in other age groups.³⁶ In other words, the elderly were usually more exposed to diseases and their deterioration.³⁶

The findings also showed that the type of insurance fund had a significant effect on the utilization and costs of laboratory, medicine, and radiology. Hassanvand and colleagues in Lorestan indicated that there was a significant relationship between the type of basic insurance and the use of medical imaging and outpatient services, so that the utilization of the individuals with rural insurance was higher than others. The greater utilization of the elderly covered by the rural insurance from the free services of health homes and health centers

could be attributed to the establishment of the rural family physician program and the requirement for patients to follow the referral system.²⁰ A study in Isfahan showed that there was a significant difference between the type of insurance coverage and the utilization of outpatient services, buying medicine, and referring to laboratories.⁶ In other studies, too, having insurance, both social or private insurance, and the extent of cost coverage by the insurance had a positive effect on utilization of outpatient services.^{23,37-42}

The present study provided useful information on utilization of outpatient services, but like other studies, it had some limitations, one of which was the incompleteness of the variables affecting the utilization of health services due to the lack of access to data. Another limitation was that in this study, only the insurees of the IHIO were addressed, and the people covered by other insurances were not included. Despite these limitations, the current findings that the consumption and cost of the elderly in insurance funds are high, and the difference in consumption and cost among different health insurance funds can be used in the policy making of the health and insurance sectors to optimally use the available resources.

5 | CONCLUSION

The utilization and costs of laboratory, medicine, and radiology services were higher among the elderly and women. To control the costs of insurance organizations, it is helpful to identify the effective factors. In addition, due to the increasing trend of aging in Iran, it seems necessary to periodically monitor the pattern of the elderly people's utilization of health services and to plan to increase sustainable resources for insurance financing in the coming years.

AUTHOR CONTRIBUTIONS

Ali Mohammadi: Data curation; investigation; resources; software; visualization; writing—original draft; writing—review & editing. **Farhad Lotfi:** Conceptualization; data curation; investigation; resources; supervision; writing—review & editing. **Ramin Ravangard:** Conceptualization; project administration; validation; writing—original draft; writing—review & editing. **Mehrnoosh Emadi:** Investigation; software; visualization; writing—original draft. **Mohsen Bayati:** Conceptualization; formal analysis; investigation; methodology; project administration; software; supervision; validation; writing—original draft; writing—review & editing.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Anonymous data from this study is not included in any public repository. However, the data sets used and analyzed during the current study are available from the corresponding author on reasonable request. Mohsen Bayati had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis. The authors confirm that the data supporting the findings of this study are available within the article.

ETHICS STATEMENT

The project was found to be in accordance to the ethical principles and the national norms and standards for conducting medical research. The study protocol of the current research was approved by the Ethics Committee of Shiraz University of Medical Sciences under code IR.SUMS.REC.1399.1182.

TRANSPARENCY STATEMENT

The lead author Mohsen Bayati affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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