

Socio-economic Inequality of Outpatient and Inpatient Healthcare Services: A Cross-sectional Study in Iran

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Abstract

Background: Ensuring equal utilization of health services has always been a priority in health systems globally. Iran implemented reforms such as the Health Transformation Plan (HTP), in which one objective was to reduce inequity in access to inpatient and outpatient services. These studies aimed to measure inequality in health services utilization in Qazvin, Iran, and clarify inpatient and outpatient utilization patterns among socioeconomic subgroups of the population.

Methods: This cross-sectional study recruited 442 households living in Qazvin, Iran, in 2019. We collected data using a tool that included demographic characteristics, socioeconomic status, and health services utilization. We applied the concentration index to measure inequality and performed data analysis using STATA 15.

Results: Based on our estimates, the utilization rates of outpatient and inpatient services in the study sample were 0.89 ± 1.39 and 0.45 ± 0.94 , respectively. There was no statistically significant difference in the use of outpatient healthcare services in terms of gender and insurance coverage of the households, while literacy, age, and health condition had statistically significant effects on inpatient healthcare utilization ($P < 0.05$). Furthermore, the marginal effects of age and literacy on the utilization of outpatient services were statistically significant ($P < 0.05$), so that literacy and aging increased the outpatient HSU. Except for age, the marginal effects of other characteristics on the utilization of inpatient services were statistically significant ($P < 0.05$).

Conclusion: Our findings indicated that inequality in healthcare utilization reduced over time, showing that in addition to reducing inequality in HSU, population groups with lower socio-economic status have benefited more from both inpatient and outpatient services.

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Introduction

One important principle in the Universal Health Coverage (UHC) model is equitable access to healthcare services for people without suffering from economic hardship.¹ Sustainable Development Goals (SDG) have also re-emphasized this key issue to ensure healthy

lives and well-being promotion for all ages.² The Iranian health system also launched a series of reforms to ensure the availability and accessibility of required healthcare services for all.³ Health equity is defined as reducing and eliminating health disparities and related determinants that negatively influence marginalized or excluded groups.⁴ On the other hand, health inequity is

a particular type of health inequality that indicates an unfair disparity in health. When health discrepancies are avoidable, inappropriate policies let them maintain inequity.⁵ Unequal access to healthcare services could decline health outcomes and increase morbidity and mortality among different population groups.⁶

To improve health equity, Iran increased the government health expenditure from 171.6 to 673.6 dollars over 15 years.⁷ It also established the primary healthcare network and Universal Health Insurance (UHI) Act as healthcare reforms to achieve the purpose.⁸ Although health inequity is a global issue, the impact of different social factors on health has been revealed to be different among various countries. For example, a study conducted in European nations found much less difference in mortality between the two population groups with high and low education in Spain, while a significant difference was reported between these two population groups in the Czech Republic.⁹

The World Health Organization (WHO) has also recognized health equity as an important issue and formed the Commission on Social Determinants of Health in 2005 to gather global evidence on social determinants of health and accordingly recommend practical actions to address health inequalities.¹⁰ Focusing on the impact of socioeconomic factors on health inequality allows health policy makers to identify current health disparities in a cultural context and provide necessary insights into how social status, income, occupation, and educational level lead to health outcome differences.^{11, 12}

In Iran, despite the progress in the public health status in recent years, the health disparities due to gender differences, economic pressures, occupation, and cultural and educational status are quite evident.¹³ In fact, the socioeconomic status, and other social factors were mentioned as the indicators of health equity in Iran.^{14, 15} Literature also signified the role of eliminating inequalities in social groups as a key prerequisite for equity in health.¹⁵

Several studies have been conducted through decomposition analysis of the concentration index due to the importance of the issue. They used the concentration index (CI) to measure outpatient and inpatient economic inequality on a concentration curve. The curve is made of a two-dimensional plot of horizontal and vertical axes in which the household health status is examined about different economic status groups. In the case of equity in the health distribution among different groups, the equity line forms a 45-degree angle, while placing the curve above the equity line indicates a greater concentration of health in people with lower socioeconomic status.^{16, 17} A study examining health services utilization (HSU) among women in one of the western Iranian districts indicated an unequal distribution influenced

mainly by socioeconomic factors. Female-headed families whose husbands were lost due to death or divorce had more vulnerability to poverty, resulting in worse health status.¹⁸ Literature also emphasized the importance of race/ethnicity, parent income, parent education, culture, and healthcare access as key determinants of HSU.¹⁹ Understanding the factors related to disparities in health services utilization, particularly those resulting from inequitable access to health services can provide useful evidence for policymakers to plan more effectively with the aim to reduce undesirable conditions.²⁰ Most of the studies acknowledged that a decline in health consequences and a rise in health inequity would result in crucial side effects on the workers' productivity and reduce gross domestic product.²¹ Such information can act as a valuable guide for policymakers and evidence-based decision-making for health planning. Therefore, studying socio-economic inequity in health services utilization could fill the research gaps and help policymakers to provide supportive services. A study conducted by Kazemi-Karyani revealed that the highest socioeconomic inequity value was in Qazvin province, emphasizing the necessity for policy interventions.²² Qazvin is in the northwest of Iran with 1.2 million people by the 2016 census. The literacy rate was over 82%, and gender disposition was 50.7% men to 49.3% women.¹⁴ The main purpose of this study was to investigate inequity determinants in health services utilization among households living in Qazvin city.

Methods

Study Design and Setting

We conducted a cross-sectional study among residents living in Qazvin city, Iran, in 2019.

Population and Sample Size, Sampling Procedure

The target population included clients of urban public healthcare centers who had utilized inpatient or outpatient healthcare services during the past 12 months. We included all individuals aged 18 to 90 years who agreed to participate in our study. Using formula $[n=P(1-p)^2 z^2/d^2]$ and assuming $P=0.5$, $z=1.92$, $d=0.05$, the estimated sample size was 368. After considering a 20% loss, the sample size turned out to be 442. We determined the share of each center in the sample size based on the percentage of the total number of clients of each center.

Measures

The data collection tool was a structured questionnaire that encompassed three sections. Section one contained 12 demographic questions. Section two included 19 questions about households' accessibility to inpatient, outpatient, and diagnostic health services. The last section consisted of seven

questions in terms of the population's socio-economic status.²³ In this study, the main outcome variables were outpatient and inpatient healthcare utilization provided by public providers. The outpatient health care utilization was measured by asking the question "Have you used any outpatient care (including emergency care, outpatient visits, clinical laboratory tests, and other diagnostic procedures) during the last year?" The latter variable was also measured by asking the question "Have you received any inpatient care (for example being admitted to the hospital and hospitalized more than 24 hours) in the last 12 months?" We used demographic and socio-economic status variables (SES) as independent factors in our analysis. Accordingly, age, gender, education (illiterate/literate), basic health insurance (no health insurance/ have health insurance), health condition (no illness, have an illness), household size, and income were considered as independent factors. The validity of the questionnaire has been confirmed in similar research, such as Ranjbar et al.¹⁸ We tested the reliability of the questionnaire by the test-retest method. At first, the researcher randomly provided the questionnaire to 30 individuals who were part of the research community, and after two weeks, the participants were again asked to answer the questionnaire. Then, Cronbach's Alpha coefficient was calculated to be 0.87 which ensured the reliability of the questions.

Data Collection

First, we obtained the approval of the Ethics Committee of the Qazvin University of Medical Sciences (IR.QUMS.REC.1398.061). Then, the researcher provided the questionnaire to the clients of health centers (according to the number of samples calculated for each center with the mentioned formula) and resolved the ambiguities of the respondents with the necessary instructions about the questionnaire. If a respondent was illiterate an interview was applied so that the questioner asked questions and recorded the exact answers of the respondent.

Data Analysis

First, we entered the collected data into the STATA 11 (Stata Corp LP, College Station, TX, USA) for statistical analysis and performed all descriptive and inequality analyses using this software. We also used the Concentration index (CI) using a Lorenz curve to measure outpatient and inpatient economic inequality.²⁴ The health status and economic condition were depicted on a two-dimensional plot, determining the households' health status in different economic statuses. When utilization of health services among all socio-economic subgroups had an equal distribution, the equity line formed a 45-degree angle. Placing the curve above the equity line meant the concentration of health in people with low socio-economic status.²⁵ We analyzed data descriptively using frequency counts and percentages for categorical variables and the mean and standard deviation (SD) for continuous variables. We then constructed Poisson regression models to estimate the parameters specified in the model. The research team chose the Poisson model to identify the factors with the most significant influence on inequality as it is a probability model for count variables. These variables are those pieces of count data that are often treated as a random variable, the poisson, binomial, and negative binomial distributions to represent the distribution.²⁶ Further, we considered a P value less than 0.05 to be statistically significant.

Results

Table 1 shows that most of the participants (92.5%) were from male-headed households, and the rest were female-headed households (7.5%). The mean age of the participants was 36.6 ± 12.9 years, and 77% had pre-academic education. 78.1% had health insurance coverage, and the average household size was 3.85 ± 1.1 . The utilization rates of outpatient and inpatient services in the study sample were 0.89 ± 1.39 and 0.45 ± 0.94 , respectively.

Table 2 shows the comparison of the average utilization of inpatient and outpatient care services

Table 1: Demographic and socioeconomic characteristics of the households (n=442, Income based on Iran Rial in 2019)

Determinants	Categories	Frequency (%)
Literacy	Illiterate	46 (10.4)
	Literate	396 (89.6)
Insurance coverage	Have	345 (78.1)
	Not have	97 (21.9)
Gender	Male	410 (92.6)
	Female	32 (7.2)
	Mean	SD
Age	36.61	12.99
Household size	3.85	1.11
Income (Rial)	25,196,390	13,429,040
ISU	0.45	0.942
OSU	0.89	1.393

ISU: Inpatient services utilization, OSU: Outpatient services utilization

Table 2: Comparison of the average utilization of inpatient and outpatient services among the study groups

Types of services	Gender			Literacy status			Insurance coverage		
	Female	Male	P	Illiterate	Literate	P	No	Yes	P
ISU	0.46±0.97	0.45±0.86	0.93	0.93±1.9	0.40±0.74	0.06	0.39±0.95	0.47±0.93	0.46
OSU	0.93±1.49	0.81±1.12	0.38	2.09±2.05	1.63±1.44	0.23	1.64±1.26	1.72±1.64	0.73

ISU: Inpatient services utilization, OSU: Outpatient services utilization

Table 3: Concentration indices of healthcare utilization based on socio-economic characteristics

Types of services	Concentration index	Standard Error	P value
ISU-income	-0.045	0.053	0.39
ISU-Literacy status	-0.110	0.055	<0.05
ISU-age	0.155	0.056	<0.05
OSU-Literacy status	-0.033	0.021	0.12
OSU-income	-0.058	0.032	<0.10
OSU-age	0.041	0.035	0.25

ISU: Inpatient services utilization, OSU: Outpatient services utilization

among the population subgroups. As seen, only the utilization of inpatient services had a statistically significant difference between literate and illiterate people ($P<0.1$).

Table 3 depicts the concentration indices of healthcare utilization for the subgroup analysis in Qazvin. The corresponding concentration curves of inpatient and outpatient based on different subgroups are shown in Figures 1-6. Except for the concentration index of age, the concentration index of other socio-economic characteristics was negative. It should be noted that regarding the inpatient services utilization, only the indices of literacy and age of the households were statistically significant ($P<0.05$).

Figures 1-6 illustrate the concentration curve of inpatient and outpatient utilization based on the income, literacy level, and age of the household heads. As can be observed, the distribution of inpatient and outpatient services utilization based on the head's income and distribution of outpatient services utilization based on the head's literacy level were approximately 45 degrees tangential. On the other hand, concentration curves for the utilization of inpatient and outpatient services based on age were shown to be below 45°. It is noteworthy that Q shows the cumulative share of the use of healthcare services.

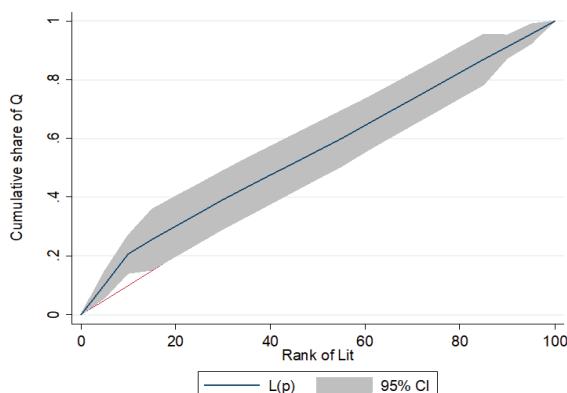
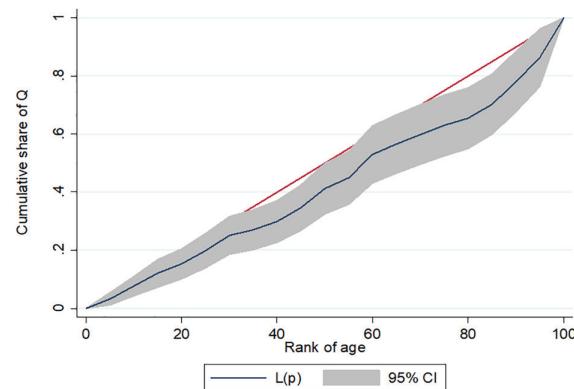
**Figure 1:** Concentration Index (CI) of inpatient Health Service Utilization (HCU)-educational status

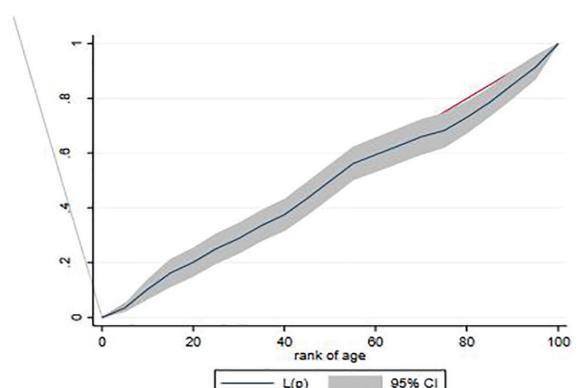
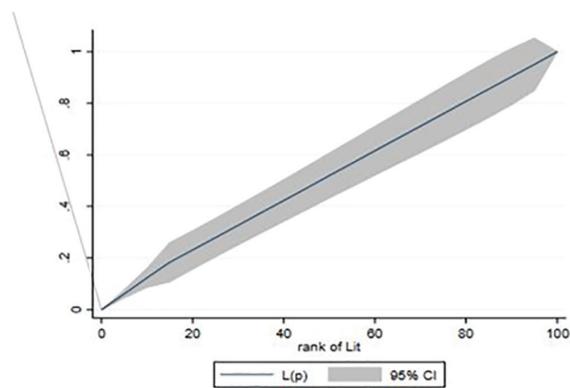
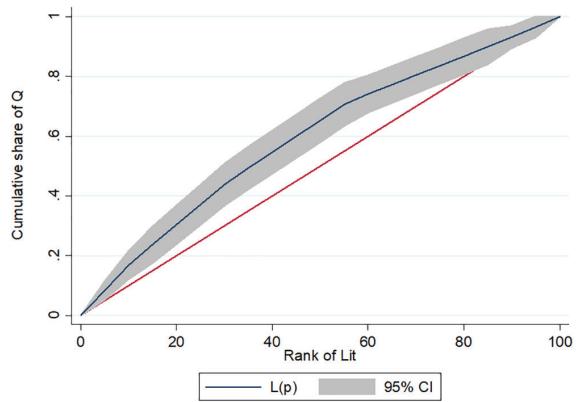
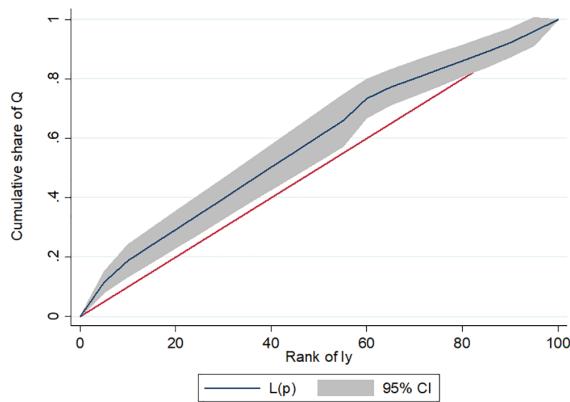
Table 4 shows Pearson correlation coefficients between explanatory variables and the utilization of health care services. As shown, some of the explanatory variables had statistically significant correlations with utilization. However, because some other non-significant variables have been identified as influential factors in the literature, we also included them in the model.

The Poisson regression shows marginal effects of age, income, gender, household size, and the literacy of households on the utilization of outpatient and inpatient services (Tables 5 and 6). As shown, the marginal effects of age and literacy on the utilization of outpatient services were statistically significant ($P<0.05$). Except for age, the marginal effects of other characteristics on the utilization of inpatient services were statistically significant ($P<0.05$).

Discussion

This study aimed to determine the pattern of inpatient and outpatient HSU among different socioeconomic subgroups of the population in Qazvin, Iran, to measure inequity in health services utilization. The study findings revealed that HSU was more among the population with lower socio-economic status (SES), those in higher age groups, and those having chronic or contagious disease during the last 12 months.

**Figure 2:** CI of inpatient HCU-age

**Table 4:** Pearson correlation coefficients between explanatory variables and healthcare services utilization

Types of services	Age	Income	Literacy	Insurance coverage	Gender	Illness	Household size
ISU	0.157*	-0.061	-0.174*	0.035	-0.046	0.647*	-.004
OSU	0.138*	-0.138*	-0.220*	-0.048	-0.041	0.579*	-.099

*Significance at the 5%, ISU: Inpatient services utilization, OSU: Outpatient services utilization

Table 5: Poisson regression of outpatient services utilization based on explanatory variables (marginal effects)

Explanatory variables	dy/dx	Robust Standard Error	Z-value	P value
Age	0.006	0.002	-2.71	0.007
Income	-0.003	0.000	-1.23	0.221
Literacy*	-0.149	0.021	-7.16	0.001
Household size	0.030	0.026	-1.15	0.250
Illness*	1.34	0.104	12.84	0.001

(*dy/dx is for discrete change of dummy variable from 0 to 1, Reference group=Healthy & Illiterate; N=442, Wald chi² (5)=208.82, P>chi²=0.001, Log pseudo likelihood=-454.281

Table 6: Poisson regression of inpatient services utilization based on explanatory variables (marginal effects)

Explanatory variables	dy/dx	Robust SE	Z	P value
Age	2	0.9	-0.22	0.26
Income	-0.0002	0.000	-2	0.004
Literacy*	-0.246	0.053	-4.60	0.001
Household size	-0.046	0.010	-4.42	0.001
Illness*	0.954	0.017	55.53	0.001

(* dy/dx is for discrete change of dummy variable from 0 to 1, Reference group=Healthy & Illiterate; N=442, Wald chi²(5)=346.38, P>chi²=0.001, Log Pseudo likelihood=-247.41

Considering that the study subjects were selected from the clients of public health centers and since most of them were from the middle and lower than average income deciles, it is expected to observe an

inverse relationship between economic status and the utilization of healthcare services. In fact, in countries where access to healthcare services and hospitalization is free of charge, people with lower SES receive more

outpatient services and are hospitalized more than those with higher SES.²⁷⁻³⁰ Several studies were in line with our findings, including research conducted by Hidayat (2004) and a study among 758 households in Markazi Province which stated that HSU was more among the population with lower socioeconomic status. The studies also added that people with lower SES suffer from poorer health conditions which simply explains the reason for the higher utilization rate among people with lower SES.^{15, 31} Furthermore, when the health system in a country is mainly public the same as in Iran, people with lower SES are more able to have access to both inpatient and outpatient care services provided in public healthcare facilities.²³ Similarly, Vahedi et al. mentioned economic status as a main contributing factor in reducing inequality in inpatient care utilization. Thus, providing healthcare services through the active engagement of the public sector could eliminate most of the socio-economic inequalities and improve appropriate access to healthcare services.⁶ This is in the same line with the findings of Leung et al.'s study conducted in Hong Kong, where public health services were mainly used by the less wealthy population due to tax-based health financing and managerial mechanisms applied to support the utilization of public healthcare services among the less well-off.³²

Some studies also mentioned gender, place of residence, and insurance coverage as the main factors influencing inequity in HSU.^{11, 12, 26} In comparison, subgroup analysis in our study revealed no significant HSU inequality regarding gender and individuals' health insurance coverage. Such differences might be due to various methods employed in different studies, both in terms of inequity investigation and the construction of socioeconomic status. In addition, the low contribution of health insurance coverage in our study might be explained by the establishment of healthcare reforms such as the primary healthcare network and Universal Health Insurance Act which facilitated the provision of required healthcare services to the population with different SES.²⁶

The CI of inpatient HSU regarding educational status was equal to -0.1105 and the C indices of outpatient HSU regarding both educational and economic status were respectively -0.192 and -0.0162. From the obtained data, it can be concluded that the size of inequality in HSU in Qazvin is insignificantly different. Therefore, the overall outpatient and inpatient care utilization was not considerably different among people with different socioeconomic classes. Perhaps, the main reason for this reduction of inequality over the past few years is the establishment of the Health Transformation Plan (HTP) in 2014 which led to extended health insurance coverage and accessibility to health services among the Iranian population.^{3, 6, 33} HTP has three main objectives, including equity in access to health services, improvement in the quality

of the provided services, and financial support of the population against the economic burden of health services. Out of the seven policy packages of this program, four are directly related to reducing inequity and providing financial support for the population against high healthcare expenditures.^{3, 33} In this regard, the results of several studies conducted in Iran and Turkey affirmed that after implementing HTP, a considerable reduction in out-of-pocket occurred.^{33, 34} Mohammadbeigi et al. revealed similar results and emphasized the vital role of primary healthcare services, which increased individuals' access to health services and decreased inequity, especially among the poor population.²⁶

Limitations of the Study

First, the analysis was based on self-reported data, which was subject to reporting bias. Second, we did not ask any standard questions about health status, such as health-related quality of life and participants' self-rated health. Therefore, the degree of health inequality may change if suitable need variables are considered in the analysis. Finally, due to insufficient sample size, we could not estimate the marginal effect of determinants by socio-economic subgroups.

Conclusion

Our findings revealed that the concentration of inpatient HSU was among people with lower educational status and older people. Furthermore, regarding the outpatient HSU, concentration was among households with lower economic and educational status and those suffering from illness. Thus, we recommend that inequality in healthcare utilization should reduce over time, indicating that in addition to reducing inequality in HSU, population groups with lower socio-economic status have benefited more from both inpatient and outpatient services.

Ethics Approval and Consent to Participate

We received approval from the Ethics Committee of the Qazvin University of Medical Sciences (IR.QUMS.REC.1398.061–2019/07/09). We obtained verbal consent from the participants before data collection and after an explanation of the study objectives. We used verbal consent because the data were collected using a self-assessment questionnaire and thus did not involve any human data. The Ethics Committee approved the use of verbal consent. Questionnaires were completed anonymously to ensure confidentiality.

Availability of Data and Material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Authors' Contribution

SR and PN developed the study protocol and the study design, data collection, interpretation of the findings, and manuscript writing. EK participated in the data collection and revised the manuscript. BA conducted the data analysis and manuscript writing. All the authors read and approved the final draft.

Conflict of Interest: None declared.

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