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Research Paper:

Inequality in the Utilization of Rehabilitation Services Among Urban and Rural Households in Iran: A Cross-Sectional Study

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ABSTRACT

Objective Demographic and epidemiological changes in the 21st century have created new challenges such as aging and the rising trend of non-communicable diseases. The high prevalence of disability (due to the growing aging population), non-communicable diseases, and accidents have increased the demand for rehabilitation services. However, there are not enough resources to meet all current needs in many parts of the world. The purpose of this study is to investigate the inequality in the utilization of rehabilitation services between Iranian households in urban and rural areas.

Materials & Methods This is a descriptive-analytical study with a cross-sectional design using the household expenditure, income survey data from the Statistics Center of Iran in 2018. The used instrument was a questionnaire surveying the expenditure and income of urban and rural households (social characteristics of household members, place of residence and main living facilities, food/non-food expenses, and household income), which was completed through interviewing the household head or a member over 15 years of age. The study samples were 18610 households in rural areas and 20348 households in urban areas. After extracting and refining the data, 38958 households were included in the study. Factors affecting their utilization of rehabilitation services and the inequality in utilization were analyzed using the Chi-square test and the Concentration Index (CI), respectively. Data were extracted in MS Access 2013 and MS Excel 2013 applications and were analyzed in STATA V.14.1 software. The geographic distribution of the service utilization was plotted using ArcGIS Map V. 10 software.

Results A total of 258 households (0.77%) used rehabilitation services. Of these, 226 (87%) had a male head, and 32 (13%) had a female head. About 60% had 3-4 members, and 239 (92%) had insurance coverage, and others (8%) had no insurance coverage. Also, 173 (67%) had an employed head. Finally, 55% were living in rural areas, and 45% in urban areas. Uninsured households had less use of rehabilitation services (P<0.05). Also, 1.32% of the fifth income quintile (highest income) used rehabilitation services, while this rate was 0.35% for households in the first quintile (P<0.001). Zanjan, Qazvin, Khuzestan, Isfahan, Lorestan, Bushehr, and Semnan provinces had the lowest service utilization rates in urban/rural areas and the whole country. Qom Province had a better status regarding service utilization in urban areas, while East Azerbaijan, Mazandaran, Golestan, Yazd, Fars, and Hormozgan provinces had higher service utilization rates in rural areas. Overall, East Azerbaijan, Mazandaran, and Qom provinces had a higher rate of utilization. The CI value for the whole

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country was reported at 0.24 (95% CI: 0.17-0.30), indicating a higher inequality in utilization in favor of the rich. The CI values for rural and urban areas were 0.27 and 0.19, respectively (P<0.001).

Conclusion There is inequality in the utilization of rehabilitation services in favor of the rich households in Iran, and low-income households have lower access to these services. The inclusion of rehabilitation services in the primary health insurance package with appropriate pricing and population coverage, and fair distribution of rehabilitation services following the needs of public and private sectors, can increase the access and utilization of rehabilitation services.

Extended Abstract

Introduction

Disability has many destructive individual and social effects. According to the "International Classification of Functioning, Disability, and Health", disability is a condition that limits and disrupts a person's participation and activities [1]. The World Health Organization (WHO) estimated that more than one billion people, or 15% of the world's population, live with some disabilities, 80% of whom are in low- and middle-income countries [2]. 2017 WHO report showed that about 183 million people have severe disabilities, indicating an increase of 23% compared to 2005 [3]. People with disabilities, in addition to the need for care from healthy people (such as vaccinations and other prevention and treatment services), need rehabilitation services [4]. Rehabilitation services include a wide range of services that seek to optimize the performance of people with disabilities [2]. The 2015 Global Burden of Diseases study showed that 74% of all Years Lived with Disabilities (YLDs) in the world was due to disabilities, indicating the need for rehabilitation interventions [3].

Although the demand for rehabilitation services is growing, its supply resources in many parts of the world do not meet the current needs since rehabilitation services have not been considered seriously by many governments [5]. This neglecting has led to improper access to these services and no coordination between the demand and supply [2]. Some studies in South Africa show that only 26% of the population receives the required rehabilitation services [6-9]. The WHO report in 2014 showed that about 76%-85% of people with disabilities in developing countries do not receive any rehabilitation services [10]. A set of factors influence the utilization of rehabilitation services. To date, various studies have examined the factors affecting the utilization and non-utilization of rehabilitation services [11]. Patel et al. showed that the utilization of rehabilitation services by people with disabilities depends not only on socioeconomic factors but also on cultural factors, residence, literacy status, gender, etc. [12]. Borker et al. showed that the non-utilization of rehabilitation services by 75.8% of disabled people in a rural community in India [13]. Another study in 2017 showed that 76.3% of stroke patients in Ghana did not use rehabilitation services due to economic problems. Some studies have reported low utilization of rehabilitation services by people with disabilities in Iran [14, 15]. Given the importance and necessity of rehabilitation services, the governments should take the necessary measures to facilitate these services for people in need. To reduce the existing information gap, the present study examines the inequality in utilizing rehabilitation services among Iranian households.

Materials and Methods

The present study is a descriptive-analytical study with a cross-sectional design using household, expenditure, income survey data from the Statistics Center of Iran in 2018. The relevant data were extracted and categorized by province, urban and rural areas. The initial analysis of raw data was performed. In this regard, the provinces of Sistan and Baluchestan, Ardabil, Kohgiluyeh and Boyer-Ahmad, Kurdistan, and West Azerbaijan were excluded from the study due to lack of data on the use of rehabilitation services (audiometry, optometry, speech therapy, and physiotherapy). Households that declared zero essential expenses (e.g. in food expenses) were also excluded from the study. Finally, the relevant data of 15929 households in rural areas, 17467 households in urban areas, and 38958 households in the whole country were included in the study.

The Chi-square test was used to investigate the relationship between the utilization and non-utilization of rehabilitation services with the study variables. In the next step, inequality in the utilization of rehabilitation services was measured using the Concentration Index (CI). To calculate this index, household income was used as a ranking variable to measure inequality. Households were divided into five categories based on income level from the first quintile (with the lowest income) to the fifth quintile (with the highest income). The CI was calculated as Fourmula 1:

$$(1)\ CI=\frac{2\times cov(y_i\, r_i)}{\mu}$$

where μ represents the average rate of the dependent variable (percentage of households using rehabilitation

services), r_i refers to the ranking of each household according to the income quintile, and y_i shows the utilization of rehabilitation services by household i. The numerical value of the CI is between -1 and +1. The positive value indicates that the use of rehabilitation services is higher among households with higher economic status. The negative value indicates that it is higher among households with lower economic status. In this equation, the dependent variable value is 0 or 1 and is not bounded within the range of -1 and +1. The normalization of the concentration index was performed by multiplying the value of CI by 1/1-μ, according to Wagstaff [16].

Access and Excel applications were used for data extraction and STATA V.14.1 software for data analysis. To better describe each province's situation in the utilization of rehabilitation services, the rate of use of these services by urban/rural areas and the whole country was also displayed on the map using ArcGIS Map V.10 software.

Results

Of the total study households, about 258 (0.77%) had used rehabilitation services in 2018. Among the households that used rehabilitation services, 226 (87%) had a male head, and 32 (13%) had a female head. Also, 52 (21%) had 1-2 members, 156 (60%) 3-4 members, and 50 (19%) had ≥5 members. Besides, 239 (92%) had insurance coverage, and 19 (8%) had no insurance coverage, and this index had a significant effect on the use of rehabilitation services (P<0.05). Heads of 173 households (67%) who used rehabilitation services were employed. Moreover, the households in the fifth quintile of income (36%) used rehabilitation services more than other quintiles (Table 1). In

Table 1. Household characteristics and their utilization rate of rehabilitation services

Variables		No. (%)		Total	P*
		Utilization of Rehabilitation Services			
		No	Yes		
Gender of the household head	Male	28700 (99.22)	226 (0.78)	28926	0.64
	Female	4438 (99.28)	32 (0.72)	4470	
Household size	1-2	8930 (99.42)	52 (0.58)	8982	<0.05
	3-4	17865 (99.12)	156 (0.88)	18021	
	≥5	6343 (99.22)	50 (0.78)	6393	
Insurance coverage	No	4007 (99.53)	19 (0.47)	4026	<0.05
	Yes	29131 (99.13)	239 (0.81)	29370	
Employment of the household head	No	10769 (99.22)	85 (0.78)	10854	0.87
	Yes	22369 (99.23)	173 (0.77)	22542	
Location	Rural area	17318 (99.15)	142 (0.85)	17467	0.09
	Urban area	15820 (99.32)	111 (0.62)	17917	
Income quintile	1st (Lowest)	5985 (99.65)	21 (0.35)	6006	<0.001
	2nd	6696 (99.45)	37 (0.55)	6733	
	3rd	6676 (99.24)	51 (0.76)	6727	
	4th	6850 (99.19)	56 (0.81)	6906	
	5th (Highest)	6931 (99.68)	93 (1.32)	7024	
Total		33138 (99.23)	258 (0.77)	33396	-

* The Chi-square test.

Table 2. Statistics related to the utilization of rehabilitation services by Iranian households categorized by the province of residence

Province	Number of Households	No. (%)	
		Utilization of Rehabilitation Services	
		No	Yes
Markazi	1433	1420 (99)	13 (1)
Guilan	1320	1311 (99.30)	9 (0.70)
Mazandaran	1036	1020 (98.46)	16 (1.54)
East Azerbaijan	1280	1263 (98.67)	17 (1.33)
Kermanshah	1373	136 (99.34)	9 (0.66)
Khuzestan	1385	1378 (99.5)	7 (0.50)
Fars	1494	1479 (99)	15 (1)
Kerman	1090	1085 (99.54)	5 (0.46)
Khorasan Razavi	1607	1595(99.32)	11 (0.68)
Esfahan	1339	1333 (99.55)	6 (0.45)
Hamedan	1375	1366 (99.35)	9 (0.65)
Chaharmahal va Bakhtiari	1167	1157 (99.14)	10 (0.86)
Lorestan	1044	1042 (99.62)	4 (0.38)
Ilam	1008	1002 (99.40)	6 (0.60)
Bushehr	1116	1113 (99.73)	3 (0.27)
Zanjan	1123	1116 (99.38)	7 (0.62)
Semnan	959	955 (99.58)	4 (0.42)
Yazd	1258	1243 (98.81)	15 (1.19)
Hormozgan	1568	1554 (99.11)	14 (0.89)
Tehran	2020	2004 (99.21)	16 (0.79)
Qom	929	914 (99.39)	15 (1.61)
Qazvin	987	983 (99.59)	4 (0.41)
Golestan	1749	1728 (98.80)	21 (1.20)
North Khorasan	1407	1398 (99.36)	9 (0.64)
Southern Khorasan	1356	1349 (99.48)	7 (0.52)
Alborz	971	965 (99.38)	6 (0.62)
P		<0.001	

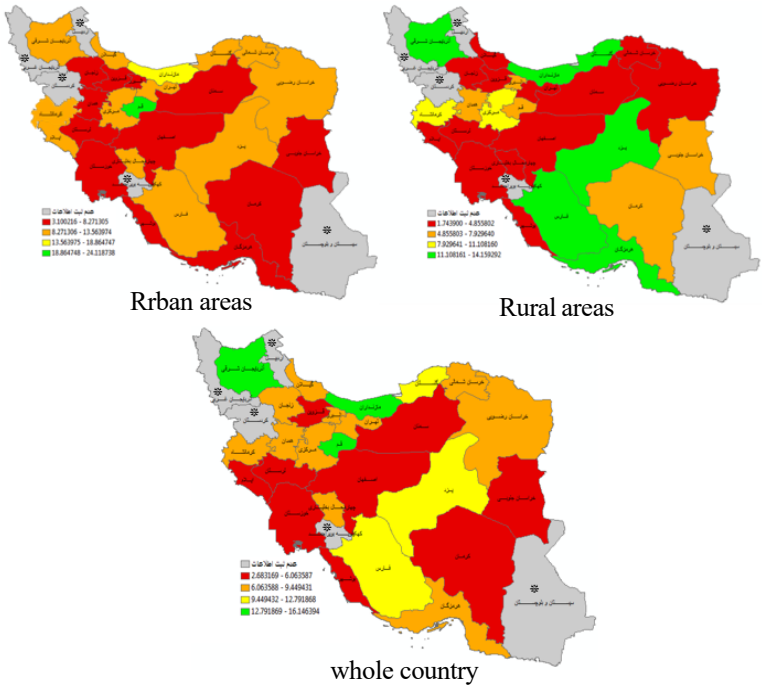

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Figure 1. Geographic distribution of the rehabilitation service utilization by Iranian households in urban/rural areas and the whole country in 2018 (per 1000 households)

terms of the utilization at the provincial level, the lowest household rate using rehabilitation services was related to Bushehr Province (0.27%), followed by Lorestan, Semnan, Isfahan, and Kerman. The highest rate was related to Qom, Mazandaran, East Azerbaijan, Golestan, and Yazd provinces (>1%) (Table 2).

According to the utilization mapping (Figure 1), Zanjan, Qazvin, Khuzestan, Isfahan, Lorestan, Bushehr, and Semnan provinces had the lowest use of rehabilitation services in urban and rural areas and the whole country (shown in red on the map). In urban areas, only the situation in Qom province was reported to be high. In contrast, a high utilization rate was reported in rural areas of East Azerbaijan, Mazandaran, Golestan, Yazd, Fars, and Hormozgan provinces. In the whole country, only for the provinces of East Azerbaijan, Mazandaran, and Qom, a high level of utilization was reported (shown in green on the map).

The study of inequality in the utilization of rehabilitation services in the whole country showed a concentration index of CI=0.24 (95% CI: 0.17-0.30), indicating inequality in favor of the rich. This condition suggests that the rich use more of these services than the poor. The value of this index for rural and urban areas was 0.27 and 0.19, respectively (P<0.001). At the provincial level, the CI values for the provinces of Kermanshah, Kerman, Isfahan, and Ilam were negative, indicating inequality in favor of the poor. However, these values were not significantly different from zero (equality in service utilization). In 11 out of 26 provinces, inequality was statistically significant (P<0.001). Among these, the highest level of inequality was related to Bushehr (CI=0.74), Lorestan (CI=0.70), and North Khorasan (CI=0.59) provinces. The lowest CI value was related to Khorasan provinces (CI=0.04), but it was not statistically significant. The lowest inequality that was statistically significant was related to Qom province (CI=0.26) (Table 3).

Discussion and conclusion

The purpose of this study was to investigate the distribution of the utilization of rehabilitation services among Iranian households. The results showed that about 0.77% of the Iranian households in 2018 had used rehabilitation services. Considering the prevalence of disability in Iran in 2011, which was reported to be about 1.35%, this finding can be justified [17]. The type of population can also affect the use of services. A study by Fullard et al. in the United States found that about 14% of Parkinson patients in 2007 used services such as physiotherapy, occupational therapy, and speech therapy [18].

The value of the concentration index in this study was 0.24 for the whole country, and it was higher in households with

Table 3. The concentration index values for the inequality in the utilization of rehabilitation services for provinces, rural/urban areas, and the whole country of Iran

Province	Concentration Index	95% CI	P
Markazi	0.10	-0.21 to 0.40	0.15
Guilan	0.45	0.08 to 0.82	0.01
Mazandaran	0.12	-0.16 to 0.39	0.33
East Azerbaijan	0.33	0.06 to 0.60	0.01
Kermanshah	-0.09	-0.46 to 0.28	0.63
Khuzestan	0.04	-0.38 to 0.46	0.86
Fars	0.30	0.01 to 0.58	0.04
Kerman	-0.15	-0.64 to 0.38	0.54
Khorasan Razavi	0.35	0.01 to 0.68	0.04
Esfahan	-0.20	-0.65 to 0.25	0.38
Hamedan	0.36	-0.01 to 0.72	0.05
Chaharmahal va Bakhtiari	0.12	-0.23 to 0.47	0.51
Lorestan	0.70	0.14 to 1.25	0.01
Ilam	-0.11	-0.56 to 0.34	0.63
Bushehr	0.74	0.10 to 1.38	0.02
Zanjan	0.12	-0.29 to 0.54	0.56
Semnan	0.68	0.13 to 1.23	0.01
Yazd	0.40	0.11 to 0.69	<0.001
Hormozgan	0.07	-0.22 to 0.37	0.63
Tehran	0.17	-0.10 to 0.43	0.22
Qom	0.26	-0.03 to 0.54	0.08
Qazvin	0.42	-0.13 to 0.97	0.13
Golestan	0.14	-0.10 to 0.38	0.25
North Khorasan	0.59	0.22 to 0.95	0.002
Southern Khorasan	0.10	-0.31 to 0.52	0.62
Alborz	0.19	-0.24 to 0.63	0.38
Whole country	0.24	0.17 to 0.30	<0.001
Rural areas	0.27	0.18 to 0.36	<0.001
Urban areas	0.19	0.09 to 0.30	<0.001

higher income. A study by Ahmadi et al. showed that, for specialized medical and dental services, inequality was in favor of the rich, while for the general medical, family physician, and primary health care services, inequality was in favor of the poor [19]. The study by Rezapour et al. in Kerman also showed that inequality in the use of outpatient and inpatient services was in favor of poorer groups [20].

Results reported that household size and health insurance coverage had a significant relationship with the utilization of rehabilitation services. With the increase of the household size, the use of rehabilitation services increased. Lack of insurance coverage for some rehabilitation services (speech therapy, occupational therapy, and technical orthopedics), long duration of use of these services, and high deductible for services such as physiotherapy led to the higher utilization of these services by the households with higher income. In other words, the use of rehabilitation services had disproportionately been concentrated on high-income households. These results highlight the need to review and modify the basic health insurance package in Iran. Some studies believe that misunderstandings of the provisions of the Public Health Insurance Act by policymakers in the past have led to the exclusion of rehabilitation services from basic health insurance packages [21]. Since studies have shown a higher prevalence of disability among poorer groups in society, it is necessary to make improvements in the regulations of health insurance to increase the benefit of these people from rehabilitation services so that they can receive the rehabilitation services according to their needs and without financial pressure [22-24].

In the present study, Bushehr and Qom provinces of Iran had the highest and lowest inequality in the use of rehabilitation services, respectively, indicating that the income gap of households in Bushehr Province had caused more inequality in the use of rehabilitation services compared to Qom Province. According to the results, inequality in the utilization of rehabilitation services was higher in rural households than in urban households. This condition probably indicates that, due to the higher income gap between households, unfair distribution of rehabilitation services, and low geographical access to these services, lower-income households in less developed areas are less likely to use rehabilitation services. Chavehpour et al. showed that the development rate is directly related to the concentration of health resources such that 70.6% of hospital beds in Isfahan and Tehran provinces were located in areas with higher social and economic status [25].

Among the provinces, Qom and Bushehr had the highest and lowest rate of using rehabilitation services, respectively. This condition indicates that the share of the public health centers in providing rehabilitation services in Bushehr Province is less than that of the private health centers. Since the cost of these services in private health centers is higher, lower-income groups are less tended to use these services. Other reasons can be the insufficient supply of rehabilitation services or less awareness of these services in Bushehr Province. Vamaghi et al. in a study in Tehran, showed that one of the reasons for not using speech therapy services was the lack of awareness of the parents about the existence of such services [26]. Studies by Rais Dana et al. [53], Soltani et al. [54], and Abdi et al. [7] showed that the existence of cultural factors such as wrong perceptions and attitudes towards people with disabilities could be one of the barriers in using these services in Iran.

The main limitation of the present study was the assumption that households would spend on rehabilitation services. In other words, only households that stated that they had paid for rehabilitation services were considered as households using rehabilitation services. Accordingly, the households that might have received free rehabilitation services for having supplementary insurance were considered as households with no utilization of rehabilitation services. However, studies in Tehran have shown that rehabilitation services covered by insurance are less popular than other services [29], which may be due to the limited options and low quality of available services [30].

Income inequality in the use of rehabilitation services significantly reduces the access of low-income people to these services, including rehabilitation services in the primary health insurance package with appropriate price and population coverage can increase equity in access to rehabilitation services. Moreover, fair distribution of rehabilitation services in accordance with the needs of both public and private rehabilitation centers can play an essential role in increasing the use of these services by households. The committed participation of institutions and organizations such as the Ministry of Health and Medical Education, health insurance organizations, welfare organizations, and Non-Governmental Organizations (NGOs) related to people with disabilities in health policy processes can play an essential role in fulfilling the expectations of this group of people about receiving rehabilitation services.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of Kermanshah University of Medical Sciences (Code: IR.KUMS.REC.1398.516).

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Authors' contributions

Study design: Jafar Yahyavi Dizaj, Farogh Nomani, Ali Kazemi Karyani; Methods of study and statistical analysis: Manijeh Soleimanifar, Mohsen Fateh, Shahin Soltani; Data analysis and interpretation: Amir Massoud Arab, Jafar Yahyavi Dizaj, Ali Kazemi, Shahin Soltani; Consulting, editing and final writing of the article: Manijeh Soleimanifar, Farogh Nomani. All authors approve the content article.

Conflict of interest

there is no Conflict of interests.

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