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# Iranian Health Transformation Plan in Physiotherapy Services: Comparison of Household Based Financial Outcomes

Seyedeh Mitra Hosseini Malekroudi <sup>a</sup>, Zahra Mohtasham-Amiri <sup>b</sup>, Enayatollah Homaie Rad <sup>a,\*</sup>

<sup>a</sup> Social Determinants of Health Research Center, Guilan University of Medical Sciences, Rasht, Iran

<sup>b</sup> Guilan Road Trauma Research Center, Guilan University of Medical Sciences, Rasht, Iran

## Abstract

**Background:** Physiotherapy services are important because they help disabled patients to return to work and other social activities. High out-of-pocket payments of physiotherapy services are one of the major barriers to the utilization of these services. In 2014 a reform named the Health Transformation Plan (HTP) was implemented in Iran aimed at improving Universal Health Coverage of Iranians. This paper researched the effects of HTP on the financial outcomes of physiotherapy services.

**Method:** Data of the Iranian Household Income and Expenditures Survey (IHIES) before and after HTP was used in this study. Out of Pocket payments, utilization of physiotherapy services, and facing catastrophic expenditures were compared using a propensity score matching estimator. Inequity indices were compared using concentration indices and curves.

**Result:** Out-of-pocket payments did not change significantly after the plan, however, utilization of physiotherapy services decreased significantly (coefficient =  $-0.00188$ , P-value = 0.032). Inequity in out-of-pocket payments improved significantly after HTP (P-value = 0.000), however, inequity in the utilization of services become worse in favor of the rich (P-value = 0.000) and the percentage of households facing catastrophic health expenditures did not change significantly (P-value = 0.407).

**Conclusion:** The health transformation plan, one year after its implementation, did not achieve its goals in terms of utilization and out-of-pocket payments and their inequity in physiotherapy services.

**Keywords:** Health equity, Iranian health transformation plan, Out-of-pocket payment, Physiotherapy services

## 1. Introduction

Health is one of the main requirements for social welfare systems. Utilization of health and medical services can improve social welfare, however, due to the out-of-pocket payments caused by health and medical services utilization, households might experience financial pressures, catastrophic health expenditures, and poverty [1]. Physiotherapy services are among those services which help disabled people to return to their own regular life, work, social activity, and others [2,3]. These services are regularly as expensive and urgent as emergency services [4]. Therefore, despite the importance of these services, basic insurance schemes do not cover

these services completely and patients must pay for these services directly [5]. Insurance mechanisms and governmental subsidies are some ways to decrease out-of-pocket payments derived from medical services utilization [6]. Despite all efforts made in this area, studies have confirmed that the financing of health services in developing countries is dominated mostly by direct payments and there is a lack of prepayment mechanisms such as taxes and insurance services [7]. In many countries, physiotherapy services are not covered by health insurance, and there is no tendency to cover these services [5]. Meanwhile, due to the need for the utilization of physiotherapy services, proper funding to reduce out-of-pocket payments and prevent household poverty is especially important [8].

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\* Corresponding author.  
E-mail address: [homaierad@gums.ac.ir](mailto:homaierad@gums.ac.ir) (E.H. Rad).

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In recent years, achieving universal health coverage (UHC) was one of the main important goals of ministries of health in the world [9]. The Iranian Health Transformation Plan was a national program that was implemented in three phases. The first phase of action was approved on April 30, 2014, including free basic health insurance for all Iranians, reducing hospital costs for hospitalized patients, review of health and medical services tariffs, financial support against chronic diseases, and encouraging physicians to work in less developed areas [10,11]. Iran's health system suffered from many problems, such as high out-of-pocket payments, which had been modified by reform systems such as the Family Physician Program, the Rural Insurance Program, and national insurance. However, there were still many concerns about fair access to resources and family protection against financial losses. All of these concerns were visible in physiotherapy services too [11]. Utilization and out-of-pocket payments of physiotherapy services were affected in three areas of tariffs, basic health insurance coverage, and financial support of the poor against catastrophic health expenditures of physiotherapy services. At the same time, several services which did not previously have tariffs were added to the new tariff book and the government considered a share of subsidies to cover the costs to decrease the amount of out-of-pocket payments [8].

Several studies have analyzed the impact of HTP on financial outcomes in Iran. For example, a study indicates that mean OOP payment of total health services were US\$59.4, US\$17.6, and US\$14.3 before and after the HTP [12]. Besides, catastrophic health expenditures and their inequality results changed from 1.99% in 2011 to 3.46% in 2017 [13]. A study showed that the OOP net amount has grown from 9.9% in 2013 to 18% in 2015 and has decreased to 2.2% in 2016. Although the proportion of OOP has decreased, available evidence shows mixed results regarding the reduction in the incidence of catastrophic health expenditure [14]. In another survey regarding HTP, results indicated the share of the population facing catastrophic health expenditures decreased significantly from 2.9% to 2.1% at the national level. The incidence of impoverishment due to OOP payments increased slightly between pre and post-HTP from 0.2% to 0.5% [15]. In a study conducted in Sistan-Baluchestan province to measure the household financial contribution to healthcare expenditures after HTP, 484 (20.2%) of the households faced CHE after implementation of the HTP [16].

Considering the increasing importance of physiotherapy services in the rehabilitation of many chronic diseases, trauma, etc. which affects people in all age

groups, in the present study, we looked back at the impact of the HTP on the cost of out-of-pocket payments and equity in these services. Some studies consider the failure of HTP using both qualitative and quantitative methods, however similar articles using quantitative methods for physiotherapy services were found in the literature search in Iran.

## 2. Methods

This was a descriptive-analytical study. The Iranian Household Income and Expenditures Survey (IHIES) was used for the years 2013 (before the plan) and 2015 (after the plan). We used data from these two years because we believe that these two years were the best years for the investigation of the Health Transformation Plan (HTP). After 2015, the country and its health system were highly affected by the budget deficit, economic instability, and high inflation rates which might affect the HTP [17]. The survey was led by the Iranian Statistical Center annually to calculate household payments and income. In that questionnaire, information such as household characteristics, social characteristics, food payments, non-food payments including clothing, shoes, water, fuel, housing, living supplies, health care costs, transportation costs, communications, cultural services and household recreation, household education, and miscellaneous goods and services were included. The data included costs paid by the household for their physiotherapy services and the number of times they were used. Households that did not use this type of service had zero costs and utilizations. Data related to the economic and social characteristics of people in each household containing literacy status, age, gender, and working status were gathered in the survey, however, to merge household level and individual-level data, the individual level ones were converted into household-level data. For example, the number of males was counted in each household and a new variable named "number of males" was generated. The propensity score matching estimator was used to compare the out-of-pocket and utilization before and after HTP. For this purpose, first, an unpaired *t*-test was used to find the potential confounding variables, after finding the confounders, the propensity matching technique was utilized. If each of the variables were significantly different before and after the HTP, they were considered as confounders. The inflation rate between the years 2013 and 2015 did not have to be adjusted because we used the annual household income as a confounding variable in the propensity score estimation. The annual income was considered as representative of inflation.

The concentration index was used to calculate the inequity index. To calculate the concentration index, first, according to the available data, the wealth index for each household was calculated using the MPCA method. The variables used in preparing the wealth index included the type of residential house, number of cars, type of building, having a bathroom, toilet, access to water, electricity, telephone, smart TV, cell phone, radio, refrigerator, personal computers, air conditioner, central heating system, type of cooking system, and the surface of the home. After calculating the wealth index, the concentration index was calculated using the following formula:

$$c = \frac{2}{n \cdot \mu} \sum_{i=1}^n x_i R_i - 1$$

where  $x$  is the rate of benefit from physiotherapy services and the amount of out-of-pocket payments by each household.

### 2.1. Calculating catastrophic health expenditures

As a definition, if the household monthly out-of-pocket and other related payments due to physiotherapy services exceeded 20% of total monthly income, the family faced Catastrophic Health Expenditures (CHE). Stata SE v 14 software was used to analyze the data.

### 2.2. Ethical issue

This study was approved ethically by the Deputy of Research, Guilan University of Medical Sciences. Ethics code: IR.GUMS.REC.1397.484.

## 3. Results

Table 1, the results of household-level descriptive statistics are shown. The number of males in the

households was 1.832 ( $\pm 0.005$ ) before the plan and 1.795 ( $\pm 0.005$ ) after it. The age average of people was 34.55 ( $\pm 0.0867$ ) before HTP and 36.645 ( $\pm 0.0895$ ) after HTP. The number of illiterate people in each household was 2.678 ( $\pm 0.008$ ) and 2.663 ( $\pm 0.008$ ) before and after the plan. Household size was 3.66 ( $\pm 0.008$ ), the annual average of income was 724.44 US\$ ( $\pm 3.44$ ), out-of-pocket payments for physiotherapy services was 0.129 ( $\pm 0.019$ ), utilization of physiotherapy services was 9.03 ( $\pm 0.49$ ) per 1000 households and percentage of households facing catastrophic health expenditures was 42.77 ( $\pm 2.69$ ) before the plan. The results were 940.74 ( $\pm 4.89$ ), 0.147 ( $\pm 0.0259$ ), 8.36 ( $\pm 0.49$ ), and 44.51 ( $\pm 2.86$ ) after the plan. Besides, the number of males in the household, average age of the household, number of people less than 5 years in each household, number of people more than 65 years old in each household, household size, and yearly income were significantly different between the two groups of before and after the HTP so we used these variables in a propensity matching estimator.

Table 2 shows the results of propensity score matching for comparison of monthly out-of-pocket and monthly utilization before and after HTP. Before and after data were matched by wealth index, household size, and the average age of the households, the number of children less than 5 in each household, the number of elderlies more than 65 in each household, and the number of males in each household and yearly income. After adjustment of confounding variables, monthly out-of-pocket payments did not change significantly, however, monthly utilization of physiotherapy services decreased during the period (Coefficient =  $-0.00188$ , P-value = 0.032). The percentage of households facing catastrophic health expenditures did not change significantly as the results of the propensity matching technique (P-value = 0.407).

Table 1. Descriptive statistics.

Variables	Before the health evolution plan		After health evolution plan		T-test
	Average	Standard error	Average	Standard error	
Number of males	1.832	0.005	1.795	0.005	P < 0.001
age average	34.55	0.0867	36.645	0.0895	P < 0.001
Number of illiterate people	2.678	0.008	2.663	0.008	P = 0.1741
household size	3.663	0.008	3.597	0.007	P < 0.001
Annual income average	724.4444	3.441326	940.7407	4.89991	P < 0.001
Number of people less than 5 in each household	0.2972	0.00272	0.2639	0.00279	P < 0.001
Number of people more than 5 in each household	0.2303	0.00264	0.2647	0.00261	P < 0.001
physiotherapy out of pocket	0.129648	0.019797	0.14789	0.025935	P = 0.5782
Utilization (per 1000 households)	9.03	0.49	8.36	0.49	P = 0.1905
Catastrophic health expenditures (percentage of whom utilized servicers)	42.77	2.69	44.51	2.86	P = 0.2354

Table 2. The results of propensity score matching for comparison out of pocket, utilization, and catastrophic health expenditures before and after HTP.

Variables	Coefficient	Standard error	P-value	Lower limit	Upper limit
Out of pocket payment	-0.04423	0.1042	0.671	-0.2484	0.1599
Utilization of services	-0.00188	0.00087	0.032	-0.0035	-0.00016
Catastrophic health expenditures	-0.0390	0.0471	0.407	-0.131	0.053

Table 3 shows the results of inequity indices for out-of-pocket and the utilization of physiotherapy services. Concentration index before and after health evolution plan for out-of-pocket payments and utilization of services are shown for this purpose. The concentration index of out-of-pocket for physiotherapy services was 0.246 before the health transformation plan, while it was 0.236 after the plan. The out-of-pocket inequity was significantly different between the two groups ( $P$ -value $<0.001$ ) and was lower after the health evolution plan (higher inequity). The concentration index of utilization was 0.143 before the health evolution plan, while it was 0.155 after the plan which could indicate that after the health transformation plan, the concentration index of utilization was significantly higher than before ( $P$ -value $<0.001$ ). Therefore, the

inequity in the utilization of services changes was in favor of the rich.

Figs. 1 and 2 show the concentration curve of out-of-pocket payments and utilization. The surface between the equity line and the concentration curve shows the concentration index. Lower space between these two curves could be considered as lower inequity.

#### 4. Discussion

The level of household utilization of physiotherapy services was examined a year before and after the transformation plan. The results showed a decrease in the number of people benefiting from these services after the implementation of the health transformation plan and higher inequity in favor of

Table 3. Inequity indices for out-of-pocket and utilization of physiotherapy services.

	Year	Sample	Concentration index	Standard error	P-value	Difference P-value
Out of pocket	Before	38331	0.246	0.088	0.005	0.000
	After	39857	0.236	0.101	0.019	0.000
Utilization	Before	38331	0.143	0.031	0.000	0.000
	After	39857	0.155	0.033	0.000	0.000

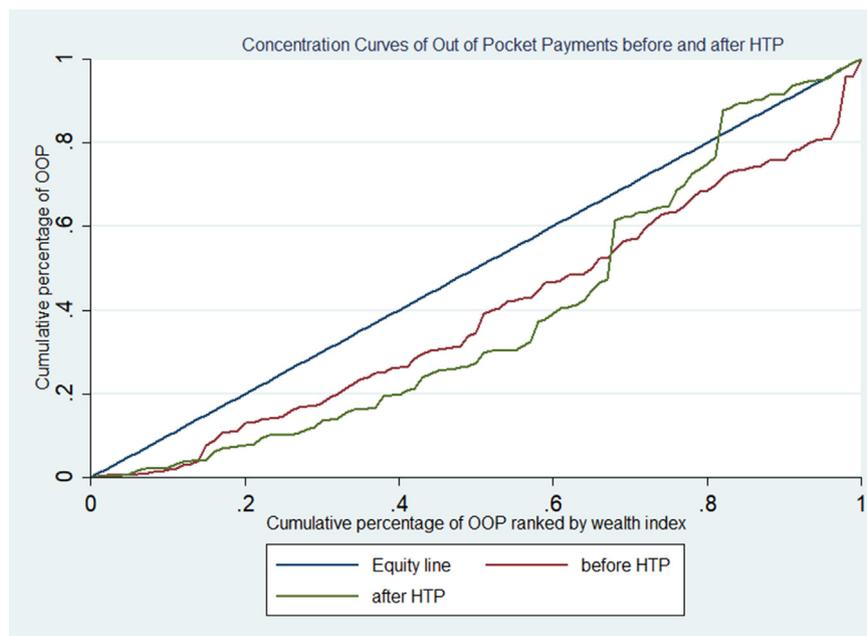


Fig. 1. Concentration curves of out of pocket payments before and after HTP.

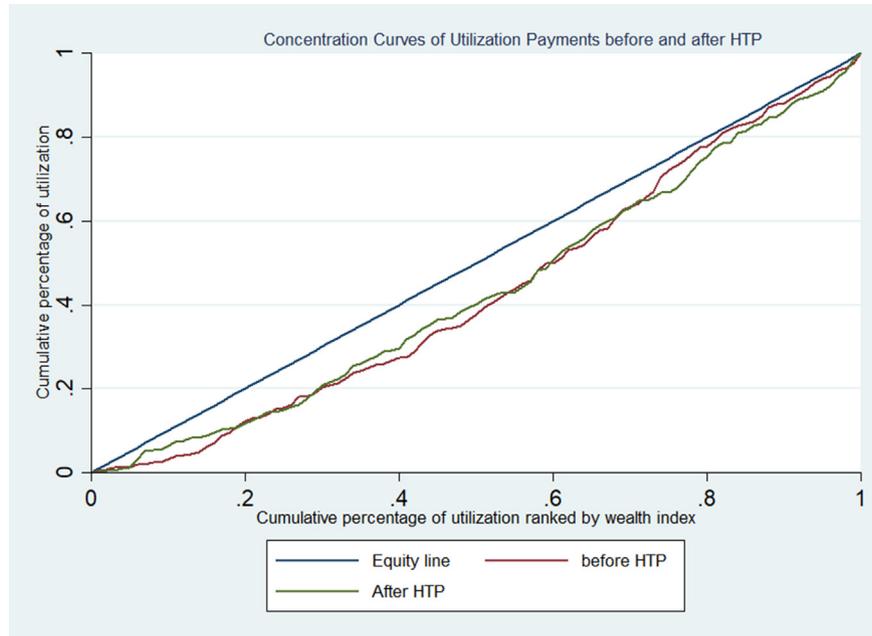


Fig. 2. Concentration curves of utilization payments before and after HTP.

the rich in the utilization of services. Inequity and out-of-pocket payments of physiotherapy improved after the HTP, inequity in the utilization of services became worse after the plan. The percentage of those facing catastrophic health expenditures was high before the HTP and remained high after it. This showed that many households using physiotherapy services had to decrease consumption of necessary goods (such as food and clothes) to pay for physiotherapy services. In a study in 2019, the financial barriers to rehabilitation services were analyzed, and the lack of insurance coverage for occupational therapy and speech therapy, low financial capacity, and insufficient financial support (low pensions for people with disabilities), and transportation costs (high transportation costs for these patients to access services were found as the most important factors [18].

In a hospital-based study done after the HTP in Iran, it was found that the average cost of physiotherapy services was 59 US\$ and the out-of-pocket percentage was 31% [19]. The main feature of progress towards achieving universal coverage is the reduction of direct payments. High out-of-pocket payments might lead to catastrophic health expenditures. Evidence has shown that after the implementation of HTP in Iran, rehabilitation services were one of the most important reasons for falling into catastrophic health expenditures [16]. So, it is very important to decrease the out-of-pocket payments related to rehabilitation and physiotherapy services. The physiotherapy

services did not cover very well in HTP. This might arise from the low interest of powerful stakeholders in financing physiotherapy services in Iran [20]. The best effort to bring the physiotherapy services to the notice of health service providers and policymakers is to increase negotiations and awareness amongst health policymakers about the importance of physiotherapy services [20]. In addition, the rehabilitation centers did not change significantly before and after the HTP plan, indicating that decreasing the utilization of physiotherapy services might not arise from decreasing in service delivery [21].

Overall, it seems that the HTP was not able to achieve its goals in terms of utilization, out-of-pocket payment, and resolving inequity in physiotherapy services, decreasing out-of-pocket payment and an increase in the utilization of physiotherapy services. Comparing out-of-pocket payments and using physiotherapy services before and after the implementation of the HTP is very important because as mentioned, one of the goals of this plan is to reduce out-of-pocket payments, which alone causes catastrophic costs. The disabled patient not only imposes a financial burden on the household but also needs to be taken care of. So at least one other family member is involved in treating the disabled patient. The condition will be worse if the disabled patient is the head of the household. Both basic and supplementary health insurances must cover physiotherapy services, especially if the head of household has been disabled. To prevent

households from facing catastrophic health expenditures, the government must pay subsidies for the utilization of physiotherapy services.

Due to the lack of a study on the costs of physiotherapy in the country and the comparison before and after the HTP, this study and its results could pave the way for other studies in this regard.

#### 4.1. Limitation of study

First, we accessed the data only one year before and after the plan, analyses will be better if more time-series data can be available. Besides, we did not access the reason for a disability which increases the need for physiotherapy services. For example, accidents might be increased during the period and more people need physiotherapy services. For future studies, it is suggested to analyze inequity and out-of-pocket payments of other rehabilitation services.

#### 5. Conclusion

The HTP of Iran was not successful in its financial goals in physiotherapy services, especially in catastrophic health expenditures. An increase in the coverage of basic insurances, as well as complementary health insurances for physiotherapy services, are necessary measures to resolve the financial goals.

#### Conflict of interest

None.

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