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Review Article

The Effect of Iran Health Transformation Plan on Equity in Health Financing: A Systematic Review

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Abstract

Background: Achieving financial goals is one of the health systems goals, especially for those in low- and middle-income countries. Since financing equity, is an objective of Health Transformation Plan (HTP) implementation in Iran, this study examined this plan toward improving equity in healthcare Financing, using four payment indices: Out-of-Pocket Payment (OOP), Catastrophic Health Expenditure (CHE), Fair financial Contribution Index (FFCI) and Impoverishing Health Expenditure (IHE).

Methods: Articles published in English on equity in financing related to HTP were searched and retrieved in the Web of Science, Scopus, PubMed, and Embase databases between Jan 2014 and Dec 2020, following PRISMA guidelines. Overall, 1319 papers were retrieved initially, and 31 were selected for analysis.

Results: After implementation of HTP, OOP index has decreased between patients and households. No consistent trend was evident for CHE. HTP reforms have a limited effect on the FFCI. The one study on IHE has shown an upward trend for this index. In general, in the early years of HTP, there was a higher downward trend in equity in financing indicators than in subsequent years.

Conclusion: HTP has made significant accomplishments in equity, such as the financial protection of patients in healthcare centers, but fail to achieve this plan goals, significantly reduced its value. Therefore, it is necessary for managers and health policy makers around the world, with scientific and principled solutions, to prevent loss of their reform plans positive achievements.

Keywords: Health transformation plan; Equity; Financing; Out-of-pocket payment; Catastrophic expenditure

Introduction

One of the health sector goals in any society is to prevent the negative impacts of socio-economic inequalities in health care use and expenditures (1). Achieve to financial goals is one of the main goals of health system, especially in low- and middle-income countries (2).

Each of these goals could be assessed by financial indicators in the form of financial assessment tools and models. Some of these indicators might be related to health financing system reforms at various levels; such as payment system indicators to health providers or reforms such as moving from a tax-based financing to a social health insurance plan. Some indicators may describe or analyze different aspects of financial reform, such as equity, efficiency, risk pooling, quality and fi-

nancial protection (3). Using and monitoring these financing indicators can be useful in verifying whether the implementation of the health reform has contributed to equity and access to healthcare services (4).

Fair financial contribution is one of the important goals of the health system. Households' participation in financing health expenditures determines the fairness of health system financing. Fair financial contribution (FFC), Catastrophic Health Expenditures (CHE), Out of Pocket (OOP) and Impoverishing Health Expenditure (IHE) are example of indicators used for calculating equity in health system financing (5).

The International Association for Equity in Healthcare Services defines equity as "the lack of systematic and potentially removable differences in one or more aspects of health in a population and its economic, social and geographical subgroups, investigated in three areas of equity in financing, equity in access to services, and equity at the community health level" (6). Equity in healthcare financing is studied by investigating services based on peoples' needs for and abilities to pay for these services, thus an equitable healthcare system offers equal services to people from different social and economic rankings and expects equal payments for the services (7).

Health decision- and policy-makers work to ensure equity in all aspects of healthcare. In recent decade, health expenditures have dramatically increased; as a result, governments have been trying to reduce direct payments allocating adequate funding for health services in order to curb OOP expenses and protect people from CHE (4). Due to unfair contribution in health expenses payment and OOP which is not commensurate with the ability to pay, more households will incur CHE and poverty (8).

Iran, like many other countries, has taken many actions in recent years to reduce these inequalities, remove the deprivation and promote health equity. In this regard, Health Transformation Plan (HTP) is one of those actions (9). The HTP in Iran was implemented by the Ministry of Health in 2014, in order to increase the quality of health services and reduce the patient's payment (10). The main goal of this plan is to achieve universal health coverage for all Iranians by 2025 (11), which includes various financing equity aspects to prevent the consequences of unfair conditions in health care financing system, such as CHE and prevent sustainable poverty for households (12). Number of households living below-Poverty line due incur in CHE is one of the health social crises that policymakers are expected to prevent it and help to build equity as much as possible, in four types of indicators; OOP, FFCI, CHE and IHE (13). Using and monitoring financing indicators can be useful to verify whether the implementation of the health reform has contributed to more equity and access to healthcare services (14).

We investigated HTP toward improving equity in health financing in Iran.

Methods

Study type and search strategy

This research is a systematic review; articles related to the topic were selected and studied from texts published in authoritative scientific databases during the years 2014 to 25 Dec 2020. English-language papers on equity in financing using the English keywords: "Out-of-Pocket", OOP, finance, payment, catastrophic, Kakwani, FFCI, Reform, Transformation, Transition, Improvement, Health, Iran" in Web of Science (ISI) databases, Scopus, PubMed and Embase were collected and screened using AND and OR operators to increase search sensitivity. Since the HTP had implemented in Iran, there are some reports that had been published in Persian. Therefore, we also searched Persian databases including SID and Magiran for published Persian papers using the Persian related keywords similar to English ones and we selected the most quality and relevant papers (Table 1).

Table 1: The search strategy of the research

Database	*Search string*	*Number of retrieved papers*	*limits*
Scopus	TITLE-ABS-KEY (out-of-pocket) OR TITLE-ABS-KEY (oop) OR TITLE-ABS-KEY ("out of pocket") OR TITLE-ABS-KEY (finance*) OR TITLE-ABS-KEY (payment) OR TITLE-ABS-KEY (catastrophic) OR TITLE-ABS-KEY (kakwani) OR TITLE-ABS-KEY (ffci) AND ALL (Iran) AND TITLE-ABS-KEY (health) AND TITLE-ABS-KEY (transformation) OR TITLE-ABS-KEY (reform) OR TITLE-ABS-KEY (transition) OR TITLE-ABS-KEY (improvement)) AND PUBYEAR > 2013 AND PUBYEAR < 2021	330	
PubMed	(((((((catastrophic) OR (out-of-pocket)) OR ("out of pocket")) OR (OOP)) OR (financ*)) OR (payment)) AND (Iran[Title/Abstract])) AND (health[Title/Abstract])) AND ((((reform[Title/Abstract]) OR (transformation[Title/Abstract])) OR (transition[Title/Abstract])) OR (improvement[Title/Abstract]))	126	date (after the implementation of health reform plan (2014)
WOS	TI=(("Out-of-Pocket" OOP OR financ* OR payment OR catastrophic OR kakwani OR FFCI) AND (Iran) AND (Transformation OR reform OR transition OR improvement))	84	
Embase	out-of-pocket OR "out of pocket" OR oop OR financ* OR payment OR catastrophic OR kakwani OR ffci :ab,kw,ti AND Iran :ta,ab,kw AND health:ta,ab AND (transformation OR reform OR transition OR improvement):ta,ab	132	
SID	Health system transformation AND Equity in financing*	400**	
Magiran	Health-system-transformation AND (Out-of-pocket OR Catastrophic-Expenditures) AND Financing*	247	
	Total	1319	

* These words were searched in Persian

** Due to huge number of results (more than 100,000 results), we sorted the papers by best match and screen the first 400 papers

Quality Assessment and selection of papers

All studies were evaluated by two reviewers. In the first stage (title review), duplicate and unrelated studies were excluded. In next step (abstract review), studies that were not related to the subject and study goal, and the review were excluded. Finally, the quality of the remaining papers was evaluated using the STROBE tool. The tool consisted of 22 sections: title and abstract, background, objectives, study design, setting (place and time of study), participants (in two sections: method and results), variables, data sources/measurement, bias, Study size, quantitative variables, statistical methods, descriptive data, outcome data, main results, other analyzes, key results, limitations, interpretation, generalizability and funding.

Inclusion criteria

Criteria for inclusion in first phase, English-language papers were published in Iran on equity in financing indicators after the implementation of the HTP. In the second stage, the inclusion criteria included study year (2014: the beginning of HTP implementation in Iran), the type of study and access to the full text of the study. Finally, in the third stage, studies that had good quality based on STROBE checklist assessment were selected.

Exclusion criteria

Based on the STROBE assessment criteria checklist, low quality studies (7=< score) were excluded. Accordingly, 56 studies were excluded after reviewing their full text.

Data Extraction

Extraction forms were used to extract the final studies. The information in these forms included the title of the article, the name of the first author, the study year, type of study, place of study, participants and the results.

All of the research processes and selection of the papers were conducted by two researchers independently (Sh.B. and H.Gh.) and a third researcher was responsible for reaching consensus

if necessary (S.D). First, 1319 papers were retrieved from all searched databases. After removing duplicates, 916 papers remained for screening. Screening was done in two separate steps including screening titles and screening abstracts. After screening, 87 papers were selected to review the full text, and finally the research team selected 31 papers (Fig.1).

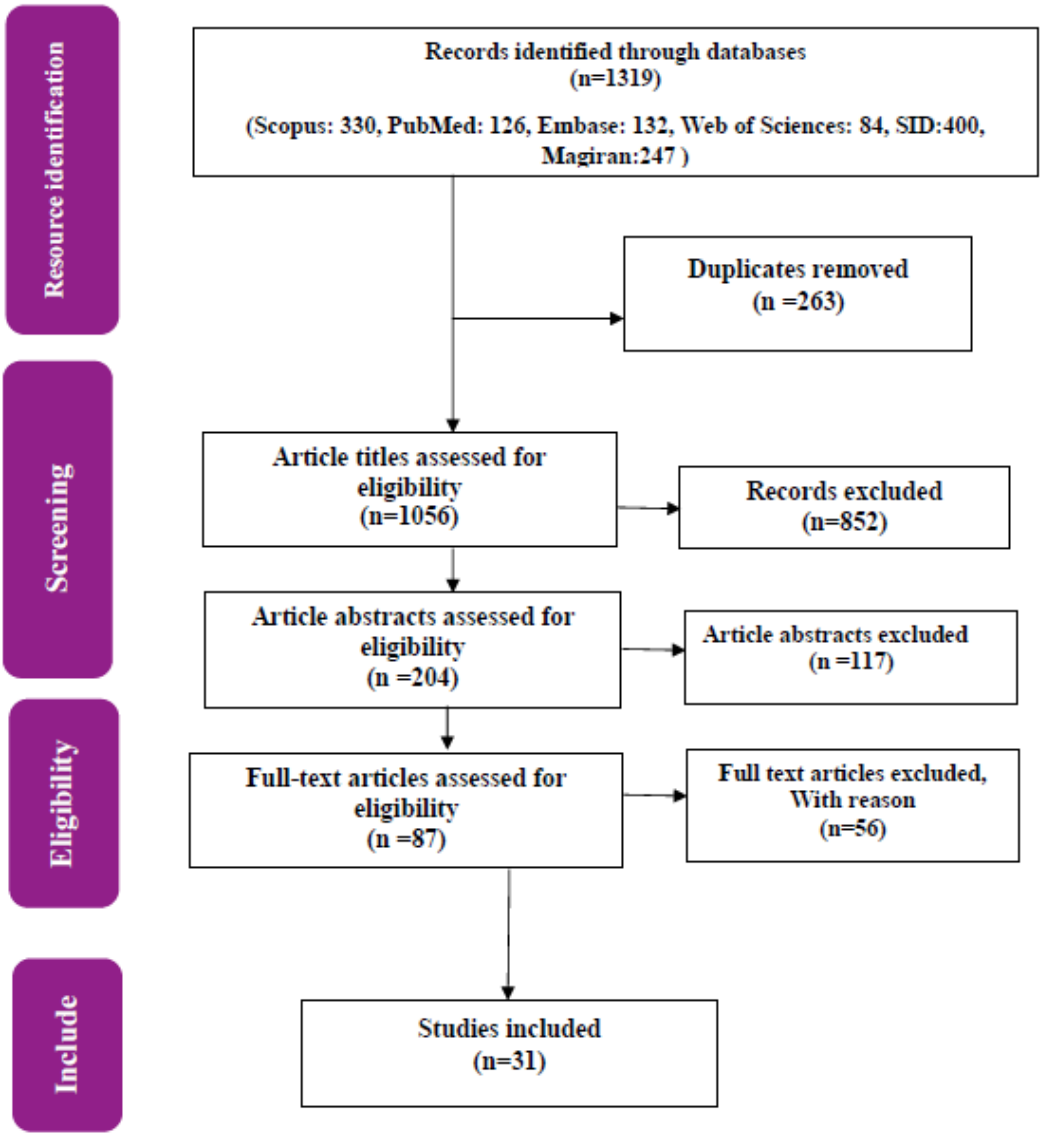

Fig. 1: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

Results

The findings resulted from the analysis of 31 studies were summarized in supplementary materials. In this study, rate of four indicators of OOP, CHE, FFCI and IHE before and after HTP implementation in Iran were examined. The impact of HTP on trend of equity indicators is shown in Table 2.

Table 2: Health Transformation plan Component affecting on Equity in health financing index

in-dex	*Authors Index*	*Sample Size*	*Result (Percentage/Rial)*		*Conclusion*
			Before (yr)	After (yr)	
OOP[1]	Abdi (27)	January–April 2013 9535 households January–April 2015 9543 households	65.96Dollars (2014)	62.41 Dollars (2015)	Total OOP after the implementation of HTP was decreased in most of the selected studies. Except two which one claimed overall and outpatient service increased OOP payments while for other types of services, no significant changes were found. The second one was done in private hospitals which reported increase in the OOP and percentage of the OOP. The results are not significant.
	Sarkhanlou (2)	leukemia patients in two six-month periods	17.12% (2013)	3.02% (2014)	
	Zahed Pasha (22)	397 hospital records 188 neonates before 209 neonates after	155.23 Dollars (2013)	85.42 Dollars (2014)	
	Alipour (17)	600 patients with CVDs	54.2% (2013)	36.7%. (2016)	
	piroozi (21)	385 (New Mothers)	16.05% (2013)	2.5% (2015)	
	Assari Arani (30)	The household income-expenditure plan has been annually developed and published by the Statistical Center of Iran for 50 years	219.81 Dollars (2011-2012)	71.49 Dollars (2014-2015)	
	Piroozi (19)	265 patients discharged from hospitals in Kurdistan province	59.4 (2013-2014)	17.6 (2015)	
	Naghdi (24)	97,000 inpatients' billing by 28 hospitals affiliated to Isfahan University of Medical Sciences	59.81 Dollars (May 5, 2014)	33.75 Dollars (August 5, 2014)	
	Homaie Rad (18)	2,422 households living in both urban and rural regions of Guilan Province (2013: 1,205 2015: 1,217)	704.26 Dollars (2013)	619.16dollars (2015)	
	Nemati (32)	400 households 1197 individuals	58% (2014)	13.2%. (2017)	
	Rezaei (20)	174,341 households	2.09% (1991) 4.87% (1996) 5.92% (2001) 6.73% (2006) 6.83% (2011)	10.61% (2017)	
	Tabari-Khomeiran (1)	81 patients at the treatment of coronary artery bypass surgery in private hospitals of Rasht before the reform and 86 ones after it	$2,636 Dollars (2013) 38.5% (2013)	5,909 Dollars (2014) 42.1% (2014)	
	Sarkhanlou(2)	leukemia patients admitted in Sari Imam Khomeini Hospital	17.12% (2013) for patient cost 16.8% (2013) for medicine	3.02% (2014) for patient costs 7.7% (2014) for medicine	
	Yaghoubi(33)	120 delivery files (60 normal delivery and 60 caesarian section)	19% (2013) for normal vaginal delivery 18% (2013) for cesarean section	3.5% (2014) for normal vaginal delivery 12% (2014) for cesarean section	
	Piroozi(21)	385 mothers in three time periods	19.51% (2013) for normal vaginal delivery 13.3% (2013) for cesarean section	0% (2014) for normal vaginal delivery 8.96% and 4.79%(2014) for cesarean section	
	Kavosi(34)	127 patients (50 patients before and 77 patients after the implementation of the HTP)	17.67% (2012)	7.64% (2015)	
	Maharlou(35)	601 CABG patients	20.2% (2013)	5.85% (2014)	
CHE[2]	Abdi (27)	January–April 2013 9535 households January–April 2015 9543 households	2.9% (2014)	2.1% (2015)	
	Piroozi (21)	663 households	- (2014)	4.8%. (2015)	
	Moradi (36)	385 households	-	MS:20.6% Dialysis:18.7% kidney transplant Patient: 13.8% (2015)	

[1] Out of Pocket
[2] Catastrophic Health Expenditure

	Piroozi (37)	189 households	-	72.7% (2018)	
	Barfar (38)	400 households with severe mental disorders patients	-	25.75% (2017)	
	Moradi (36)	Rural and Urban Households Iran	-	urban households 4.58% (2015) rural households 5.65% (2016)	
	Kazemi Karyani (39)	37,959 households	-	3.32% Rural areas:4.37% Urban areas: 2.97% (2017)	Based on the selected studies CHE has not changed significantly after HPT.
	Khammarnia (40)	2400 households	-	20.2% (2017)	
	Ahmadnezhad (26)	2013: 1 940 417 Iranian households 2016:1 940 613 Iranian households	2.5% (2013)	2.37% (2016)	
	Joshani Kheibari (29)	more than 38000 households	2.771% (2010)	3.450% (2016)	
	Kazemi-Galougahi (41)	600 households	12.6 % (2003) 11.8% (2008)	29.9% (2015)	
	Assari Arani (30)	the household income-expenditure plan has been annually developed and published by the Statistical Center of Iran for 50 years	2.9% (2011-2012)	2.3% (2014-2015)	
	Yazdi-Feyzabadi (42)	2011: 38 434 households 2017: 37866 households	1.99% (2011)	3.46% (2017)	
	Homaie Rad (18)	2,422 households living in both urban and rural regions of Guilan Province (2013: 1,2052015: 1,217)	5.75% (2013)	3.82% (2015)	
	Nemati (32)	400 households. 1197 individuals	30% (2014)	11.25% (2017)	
	Rezaei (20)	174,341 households	1.12% (1991) 2.42% (1996) 4.08% (2001) 1.75% (2006) 3.38% (2011)	5.26% (2017)	
	Joshani Kheibari (29)	More than 38000 households	0.831% (2010)	0.837% (2016)	
	Assari Arani (30)	The most comprehensive and oldest microdata in Iran's statistical system titled the household income-expenditure plan has been annually developed and published by the Statistical Center of Iran for 50 years	0.79% (2011-2012)	0.76% (2015)	
FFC3	Atefi(43)	33,363 households (2013) 33,465 households (2014) 32,971 households (2015) 33.611 households (2016) 37860 households (2017)	0.841 (2013)	0.842 (2014) 0.843 (2015) 0.845 (2016) 0.843 (2017)	The Health Transformation Plan had limited impacts on FFC index.
	Na'emani(28)	31,285 households (2007) 39,090 households (2008) 36,870 households (2009) 38,287 households (2010) 38,515 households (2011) 38,194 households (2012) 38,318 households (2013) 38,277 households (2014) 38,254 households (2005) 38,149 households (2016)	0.817 (2007) 0.82 (2008) 0.802 (2009) 0.785 (2010) 0.846 (2011) 0.838 (2012) 0.814 (2013)	0.821 (2014) 0.821 (2005) 0.854 (2016)	
IHE4	Assari Arani (30)	the household income-expenditure plan has been annually developed and published by the Statistical Center of Iran for 50 years	0.34% (2011-2012)	0.50% (2014-2015)	IHE index deteriorated after the implementation of health reform plan

[3] Fair financial Contribution Index
[4] Impoverishing Health Expenditure

OOP

Among the total number of studies conducted on this index, 45.5% were related to household surveys and 55.5% were related to patients and new mothers. The results of studies conducted before and after the implementation of HTP showed that OOP index has significantly decreased among patients and new mothers. This index has shown a downward trend in most studies conducted among households and one studies has considered an upward trend for OOP to their total expenditure. In general, according to the results of the studies in this table, trend of OOP index in the early years following the HTP has had a steeper slope than subsequent years and payments has gradually increased.

The statistical populations of present studies include patients, households and pregnant women, that their information has been collected from the Statistical Centre of Iran. In reviewing these papers, OOP index have been reported more in patient studies than household ones. The greatest impact of HTP implementation regarding this index is first on childbirth and then for outpatients and households.

CHE

Among total research conducted on this index, 93.75% was related to household surveys and 6.25% was related to patients. CHE Studies have not shown a consistent trend. Facing CHE among households in some studies after HTP has a decreasing trend. However, we can see a decreasing trend in early years of HTP implementation, like out-of-pocket payments, and then CHE has gradually increased.

These studies have been performed among households and patients, in household surveys or through Statistics Center of Iran. The rate of CHE index has been reported more in most studies conducted on households with chronically ill patients than in other studies.

FFCI

All studies on FFCI have been based on information from Statistics Center of Iran. The results showed that the HTP implementation had a limited effect on the FFCI.

IHE

The only study on IHE was conducted on households based on information from the Statistical Center of Iran; it showed an increasing trend of this index after HTP implementation.

Discussion

Health systems are constantly modified to organize better financing, efficiency, effectiveness and equity by increasing expenditures, increasing community expectations and financial resources limiting. In Iran, due to various problems in health and treatment, HTP began with two main objectives; increasing access and increasing equity in health services (15). The present study aimed to discuss HTP toward improving equity in health financing in Iran.

OOP is one of financial resources in health system that might cause severe suffering for many households (16). Examining the amount of this type of health expenditure after reforms can be useful for future planning. According to our findings, the participation of cardiovascular patients in OOPs decreased from 54.2% in 2013 to 36.7% reached in 2016 (17). Homaei Rad's study among Gilani households reported that OOP in 2013 before HTP, $ 704.26 and $ 619.16 in 2015 after it (18). Rezaei et al. plotted an upward trend in OOP between 1996 and 2017, due to the inverse relationship between OOP and total expenditure (19, 20). Reason for OOP reduction in their study is natural childbirth promotion in HTP (21). Another reason for difference in amount of OOP in the studies in which the study population was patients and hospitals (2, 17, 22-24) could be the difference between type of ownership and specialization of hospitals, the difference in type of disease and the difference of the medical equipment used for operations and the average length of stay hospitals.

The results of the present study showed a decrease in OOP after the HTP implementation.

According to this study's information, immediately after the implementation of HTP, there was a noticeable decrease in OOP, but gradually the rate of OOP was increased. Therefore, at the beginning of the plan, health policymakers were able to successfully reduce OOP significantly and take an effective step toward achieving their goals, which could be due to resources allocation from targeted subsidies policies and one percent value added taxes (VAT) in form of health subsidies. Increasing insurance premium was also an important step in HTP, which was effective in reducing government resources allocation. Although the percentage of patients 'payments decreased, but due to the increase in service tariffs, the amounts of patients' payments did not show a significant change, and OOP index has not decreased much due to this issue. Based on service tariffs increase, people's costs increase, but since HTP emphasizes the reduction of the deductible, besides to be one of the basic pillars of this plan, this cost difference is imposed on insurance companies and the cost insurance rates have also increased.

Although central government payments have been increased, but the revenues obtained from Iranian Subsidy Reform Plan have not always been stable, and this instability itself will be one of the main concerns of experts regarding the long-term continuation of HTP. Continued HTP application raises the expectations of the medical community (increased income) and people (services at low cost). Due to limited resources, the continuous increase in health expenditure is the main obstacle to continue plan, and if the plan stops, the expectation created in the medical community can lead to dissatisfaction, in which case, the real solution to the problems of this sector will be very complex and difficult.

If economic indicators do not improve and the country does not get out of the recession and, and on the other hand the goals expected by the legislator are not achieved by implementing targeted subsidies, this plan will face severe instability, which will cause distrust in people, facing CHE and finally return to the previous situation.

CHE is defined as an occasion in which a household's out-of-pocket (OOP) spending exceeds 40% of the total income that remains after subtraction of living expenses; it inflicts irreparable damage to households and it should be considered by politicians (25). According to present study, CHE has not changed significantly after HTP. For example, only a 0.13% of CHE was reduced in 2016 compared to 2013 (26). The rate of CHE for Iranian households before the HTP implementation was 2.9% and after it in 2015 was 2.1% (27). Therefore, there was no consistent downward trend in CHE after the implementation of HTP. A possible cause could be increase in health spending due to inflation in recent years, decreased impact of the Plan on health expenditure and has imposed even higher expenditure on households. Therefore, given the importance of the CHE, health system policymakers should modify their strategies in this regard.

The reason for high CHE in some studies can be attributed to the higher risk of the studied communities to face CHE and the difference in the studied years. Insurance coverage reduces the CHE, and those households that have an elderly person, a member with a chronic illness or disability, or hospitalization history had more facing CHE.

FFCI generally reflects inequality in the financial contribution of households in health (28). This study showed that HTP had low impact on the FFCI (29) and even negative impact on HTP (30). According to the present study, health policies have not had a significant impact on improved equity financing; FFCI has decreased in some cases after HTP, it can be due to the lack of fair distribution of financial burden of medical expenses and alarm for the Iranian health care system. Therefore, more efforts are needed to increase the efficiency of health costs and improve and streamline the health system.

OOP and CHE are two important indicators that should always be considered in health care planning (31). During the present study, the IHE index has been changed negatively since the implementation of the Plan. IHE was negatively changed from 0.34 to 0.5 after HTP (30). In fact,

the implementation of HTP has not reduced the IHE and has even directly or indirectly increased it. Therefore, health services managers need more research to solve the problem in this regard.
This study faces several limitations including limitations related to databases and search strategies by researchers. Moreover, equity in health financing includes a vast range of topics and indices; thus, conducting just a systematic review cannot show the details of the studies. Therefore, it is better to conduct several systematic reviews on the aspect of equity in health financing to achieve better results.

Conclusion

The present study discussed HTP toward improving equity in health financing in Iran, using four indices of OOP, CHE, FFCI, and IHE. Although the plan has had positive impact on progress in financial protection of patients in public hospitals and equity, the failure to implement it completely has significantly reduced its efficiency. Health services managers and politicians should must design and implement large-scale programs at macro level for their public and private sector services and with scientific and principled solutions, prevent loss of the positive achievements of their reform plans.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Availability of data and materials

All the data and materials used and/or analyzed during the current study are available from the corresponding author.

Conflict of interest

The authors declare that there is no conflict of interests.

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