Health equity in Iran: A systematic review

Hesam Ghiasvand1, Efat Mohamadi2, Alireza Olyaeeemanesh1,4, Mohammad Mehdi Kiani2,5, Bahram Armoon6, Amirhossein Takian1,4,5*

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Abstract

Background: Health inequities are among debatable and challenging aspects of health systems. Achieving equity through social determinants of health approach has been mentioned in most upstream national plans and acts in Iran. This paper reports the findings of a systematic review of the current synthesized evidence on health equity in Iran.

Methods: This is a narrative systematic review. The relevant concepts and terminology in health equity was found through MeSH. We retrieved the relevant studies from PubMed/MedLine, Social Sciences Database, and Google Scholar in English, plus the Jihad University Database (SID), and Google Scholar in Farsi databases from 1979 until the end of January 2018. The retrieved evidence has been assessed primarily based on PICOS criteria and then Ottawa-Newcastle Scale, and CASP for qualitative studies. We used PRISMA flow diagram and a narrative approach for synthesizing the evidence.

Results: We retrieved 172 455 studies. Following the primary and quality appraisal process, 114 studies were entered in the final phase of the analysis. The main part (approximately 95%) of the final phase included cross-sectional studies that had been analyzed through current descriptive inequality analysis indicators, analytical regression, or decomposition-based approaches. The studies were categorized within 3 main groups: health outcomes (40.3%), health utilization (32%), and health expenditures (27%).

Conclusion: As a part of understanding the current situation of health equity in the policymakers’ need to refer the retrieved evidence in this study, they need more inputs specially regarding the social determinants of health approach. It seems that health equity research plan in Iran needs to be redirected in new paths that give appropriate weights to biological, gene-based, environmental and context-based, economic, social, and political aspects of health as well. We advocate addressing the aspects of Social Determinant of Health (SDH) in analyzing health inequalities.

Keywords: Health Equity, Health Inequality, Health Care Disparity, Health Care Inequality, Health Social Determinants, Health Care Availability, Health Care Accessibility, Health Disparity, Health Care Utilization

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Introduction

Health equity and equal access to health services for various socioeconomic groups are among ultimate goals of any health system. Nonetheless, the concept of health equity has been controversial, rendering an ongoing debate among health policymakers and planners over the past decades (1). Significant inequities in various aspects of health, ie, health outcomes, utilization of health services, and health financing (2), are major concerns in all contexts, ie, low, middle- and high-income countries. The publication of a series of regular reports began by Black in the 1980s in England, which was followed by other countries, including the United States (3). This was a global turning point in

What is “already known” in this topic:
Health inequalities are evident in Iran. Despite various theoretical concepts, measurement methods and hypothetical approaches available to tackle the problem in the country, a comprehensive and national review on the status of health equity is still lacking in Iran.

What this article adds:
This study systematically synthesizes the existing evidence to assist policymakers understand and realize the dimensions of health equity. Iran needs more efforts toward redirecting the agenda setting for both investigation and action regarding health equity.
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health inequity analysis. Ever since, many studies have focused on the impact of socioeconomic factors on the health status of the community. In addition, health equity has been the subject of many studies from different aspects, ie, availability, accessibility, utilization, healthcare payment and financing, morbidity, and mortality, while studies have focused on children, adolescents and young adults, elderly, women, and different ethnicities across various settings (3-7).

Given the key role of equity in improving community health, a number of international and national organizations have made continuous efforts to reduce health inequities. For instance, during the last 2 decades, the World Bank (WB), in cooperation with other agencies, eg, the World Health Organization (WHO), have worked with member states to improve the health and nutrition status and demographic indicators as well as protecting the population against the consequences of illness, malnutrition, and high fertility (5). Health equity and equitable access to healthcare services are also strongly endorsed by the Iranian constitution and other upstream policies, eg, various national development plans. Nonetheless, achieving these objectives still remains a big challenge (8-10). Health equity analysis has been a popular research topic at the provincial and national levels during the recent decades in Iran, eg, the 2 rounds of Urban HEART (Health Equity Assessment Research Tool) project in the capital city of Tehran, a collaboration among WHO, Tehran Municipality, and the Ministry of Health and Medical Education (MOHME) (11), Iran’s Multiple Indicator Demographic and Health Survey (IrMIDHS) (12), and the Urban and Rural Expenditure-Income Survey (13). These efforts alongside a relative rich body of health equity analysis in the country show us the importance of health equity as a main concern for both academicians and government. Anyway, we need to monitor the trend of health equity researches in the country through a comprehensive lens. This implies on answering the following question:

- What are the main methodological approaches in health equity analysis in the country?

- What dimensions and scopes of health equity have been more addressed, and which ones need to be a part of research agenda for helping policymakers?

To achieve the objectives of health equity, it is pivotal to determine the current status and document the existing studies, plans, and synthesized knowledge about health equity. Nevertheless, comprehensive and national reviews with consistent evidence on health equity status is still lacking in Iran. This study aims to provide the current gap in conducting health equity studies in Iran through a systematic review approach. This implies on synthesizing the evidence for Iranian health policymakers to realize in which dimensions of the health equity the country needs more efforts, and then redirecting the research policy agenda to them.

Methods

Search Strategy

This was a systematic review of the literature on health equity in Iran between 1979 (the beginning of the Islamic revolution) until 01/31/2018. We used the PRISMA flow diagram and a narrative approach for synthesizing the evidence. We searched PubMed/Medline, Cochrane Library, and Google Scholar in English as well as the Jihad University Database (SID) and Google Scholar in Farsi. Because of the nature of health equity analysis, it can be considered as an interdisciplinary field between health and medical sciences and social sciences. This means that health equity encompasses the health, medical, social, economic, political, environmental, philosophical, religious, and criminal dimensions. Therefore, we approached our search strategies through seeking PubMed/Medline, and Social Sciences Databases, the first of which is a biological, health and medical sciences database, and the second contains all aspects of the social sciences.

We found the MeSH terms for various terms and expressions as presented below:

Health Care Equality, Health Care Fairness, Health Care Utilization, Health Care Accessibility, Health Care Availability, Health Care Affordability, Horizontal Equity in Health Care, Vertical Equity in Health Care, Health Services Equality, Health Services Fairness, Health Services Accessibility, Health Services Availability, Health Services Affordability, Horizontal Equity in Health Services, Vertical Equity in Health Services, Inequality in Health, Disparity in Healthcare, Health Care Inequalities, Inequalities, Healthcare Disparity, Financial Protection in Health, Catastrophic and Impoverishing in Health Services, Fairness in Financial Contribution in Health, Gender Inequality in Health. Appendix presents the search strategy by databases.

Studies Primary Assessment

Two team members (H.G.H. and E.M.) were responsible for the primary assessment of the studies, and in case of any disagreement, a third person (A.T.) was involved.

The details are provided as follows:

P (Health Problem): Studies that address all aspects of health equity (as mentioned in search strategy keywords above) in Iran.

I (Intervention): No restriction for this criterion. All clinical, social, economic, and cultural interventions in clinical, individual, social, national and macro contextual context were considered.

C (Comparator): This criterion was also is in line with the intervention and there was no restriction on comparators.

O (Outcomes): Biological, health-related measures, morality, morbidity, quality of life, and wider consequences in the social context of Iran were considered.

S (Study Design): All studies that assessed various aspects of socioeconomic inequalities through descriptive analysis, calculation of regression coefficient for different inequality indicators as well as qualitative, longitudinal, case-control, cohort, and cross-sectional studies were included.

Exclusion Criteria: We excluded the Iranian immigrants living in other countries. In addition, we excluded protocol studies during the final phase. As some national research projects and studies were conducted through collaborations between the international agencies, eg, the World Health
Organization, with the Iranian national authorities, eg, the Ministry of Health and Medical Education (MoHME), Tehran Municipality, etc., in both Persian and English, we considered them as primary, and if qualified, appraised them qualitatively.

Data Extraction and Study Quality Assessment: We used the Newcastle-Ottawa Scale for the critical appraisal of the remained studies from the primary screening stage. All studies in this stage were nonrandomized controlled trials (non RCTs); thus, we used Newcastle-Ottawa Scale for assessing their quality (14).

In addition, for the critical appraisal of the qualitative studies, a systematic review was done using Cambridge Quality Appraisal tools (15, 16).

Critical appraisal was done by B.A. and M.M.K., and any discrepancies were discussed with E.M. The results of the quality appraisal of the studies are included in various tables of summary of articles.

Data Extraction and Synthesis: Data on the included studies were extracted by E.M. and M.M.K. through a checklist that included the author(s) names, year of publication, title of the study, aim(s), study type, sample size, data gathering tools and methods, main results, and conclusions. All data were used to present the results of the current study thorough a narrative synthetic approach.

We categorized the included studies based on 5 characteristics: study design; outcome variables; method of analysis; level of study; and the publication year, as described in Table 1. Most studies were analytical, analyzed service variables (hospitalization, outpatient, paraclinical, pharmacy, etc.), and used concentration index (CI) as a main indicator (Table 1). Because some papers used more than 1 tool in the analysis, the total number of included articles in the Data analysis category was 147 (instead of 114 actual papers included in this review). We present our findings based on the 3 dimensions of equity: health outcomes, utilization, and financing. As previously mentioned, we were faced with a wide range of topics as our main outcomes, and grouping them was a major challenge, so we used the World Bank health equity researchers approach to summarize and present the results in an organized fashion (7).

Results
Figure 1 summarizes the flowchart of our literature review and data extraction process, based on PRISMA protocol (Fig. 1).

Studies’ Characteristics
A major part (approximately 65%) of the included studies were analytical that aimed to investigate the association between health outcome(s) inequality with socioeconomics and demographics determinants. Calculating and analyzing the health services (cares) inequality constructed about 30% of the interested outcomes by researchers. Also, 26.4% of the study have used Concentration index as their main inequality analysis indicator. About 46.5% of the studies are national level studies, which means they have used data extracted from national surveys for analyzing health inequality. The main part of the studies (57%) has been performed between 2011 through 2015. Details of the studies’ characteristics are available in Table 1.

1- Health Outcomes: Investigating the factors that affect health equity outcomes was the main focus in 36 articles (15-60 in Table 2). We included all studies whose focus were life expectancy, mortality, quality of life, and incidence of diseases and health disorders (both mental and physical) in this category. These articles documented that inequality in demographic variables can affect the health outcomes.
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2- Healthcare Utilization: A total of 37 (32%) studies focused on utilization of health services and analyzed the availability, accessibility, and use of health services. For instance, they measured the distribution of health facilities (bed and human resources, etc.) and access to health care services, which may help improve the distribution policies of health care resources in the country. The results also revealed a meaningful unequal distribution of resources among affluent and deprived areas in Iran and thus the need to redistribute the resources to improve equity in access. Table 3 presents a summary of the objectives and findings of these studies.

3- Health Financing: A total of 31 (27%) of the studies addressed equity in health financing. The major concern about equitable health financing is inequalities between the poor and the rich. Three main focus areas of equity in health financing are OOP, catastrophic payments (those that exceed a prespecified threshold), and impoverishing payments (those that cause a household to fall below the poverty line). A brief overview of the objectives and results of these studies is presented in Table 4.

Discussion

More than 90% of the final included studies had a cross-sectional design with a quantitative approach, and only 4% were qualitative. Analyzing inequality in the preventive, outpatients, inpatients, diagnostic, and other clinical and medical services constructed about 30% of the studies. The main outcome of interest for Iranian health equity researchers was health resources (human resources, beds, and equipment). There was not any meaningful contribution in analyzing the outside health system contributors to analyzing the health equity.

The findings of our systematic review showed that health equity and its various dimensions were of major research concern in Iran. The included studies mostly assessed the distribution of resources, used macro data (such as the statistical data obtained from the Statistical Center of Iran or the MOHME), and were descriptive. Our review identified 3 main dimensions of equity: health outcomes, utilization, and financing categories. In terms of health outcomes, the studies focused on inequalities in life expectancy; maternal mortality; child mortality; and risk factors, such as diabetes, and obesity; and health indicators, eg, child health, oral health, and specific diseases. Continuous reforms, eg, the expansion of primary health care (PHC) networks, the modified medical education system to respond to increasing demand for expert human resources for health (HRH), and advances in insurance coverage have all contributed to increased life expectancy, decreased mortality, and improved health literacy. However, great challenges still remain, eg, equitable distribution of the health resources, ie, HRH across the country, especially in deprived and marginalized areas.
areas, suffer from unfavorable economic conditions (11, 128, 129). Demographic transitions, urbanization, and lifestyle changes have altered the pattern of diseases from communicable to noncommunicable diseases (NCDs), whose risk factors vary, as our included studies revealed, among various socioeconomic groups. Thus, tackling it would require enhancing public health literacy about such risk factors and the ways to prevent them (45, 130, 131). Regarding

utilization of health services, inequalities in the distribution of the health resources, for instance, the existing gap in the available health sector resources, eg, access to specialist physicians, and the distribution of hospital beds, particularly intensive care and burn beds, are among major concerns. Despite the continuous efforts to improve the status, including the recent health transformation plan (HTP) that...
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Table 2 Ctd

| Author(s) | Aims | Study Design | Newcastle-Ottawa Scale** | Main outcome(s) |
|-----------|------|--------------|--------------------------|-----------------|
| Hosseinpoor AR, Van Doorslaer E, Speybroeck N, Naghavi M, Mohammad K, Majzadeh R, et al. (34) | To quantify the determinants' contributions of socioeconomic inequality in infant mortality | A cross-sectional study on Iran Demographic and Health Survey data | Good | Decomposing of Inequality |
| Almasi-Hashemian A, Sepidarkish M, Safiri S, Morasae EE, Shadi Y, Omani-Sanjari R.(35) | To determine the economic inequality in history of stillbirth and understanding determinants of unequal distribution of stillbirth in Tehran, Iran. | A cross-sectional study | Good | Decomposition of the Concentration Index of stillbirth |
| Rad EH, Khodaparast M. (36) | Taxation system and health insurance contribution of Iranians were assessed | A cross-sectional analysis on data obtained from Iran Statistical Center. | Satisfactory | Kakwani Index of health insurance contribution |
| Emamian MH, Zarehii H, Majzadeh R, Sharati M, Hashemi H, Fotouhi A. (37) | To report the status of the unmet refractive need and the role of economic inequality | A cross-sectional nested case-control study | Good | Oaxaca-Blinder decomposition method of unmet refractive need |
| Hosseinikhani Z, Nedjat S, Atlantouzi A, Mahram M, Majzadeh R. (38) | To assess the association of child maltreatment with socioeconomic status among schoolchildren | A cross-sectional study | Satisfactory | Concentration Index of child maltreatment |
| Mansourni A, Ranazi MA, Fallahi M, Alivandi L. (39) | To estimate and decompose educational inequalities in the prevalence of IBS | A cross-sectional study | Good | Concentration Index |
| Fateh M, Emamian MH, Asgari F, Alami A, Fotouhi A. (40) | To investigate the socioeconomic inequality of hypertension in Iran and to identify its influencing factors | A cross-sectional study | Good | Slope index of inequality (SII) and concentration index (C) for hypertension. |
| Moradi G, Ardakani HM, Majzadeh R, Bidargarpour F, Mohammad K, Holakouie-Naieni K. (41) | To determine the socioeconomic status (SES) of inequalities and the proportion of the determinants in nonuse of seat belts in cars and helmets on motorcycles | A cross-sectional study | Good | Oaxaca-Blinder decomposition |
| Veisani Y, Delpishan A, Moradi G, Hassanzadeh J, Sayehmiri K. (42) | To estimate the relationship between the socioeconomic status and addiction and mental disorders in suicide attempts | A cross-sectional study | Good | The concentration index, concentration curve, and comparison of Odds Ratio (OR) in different SES groups were used to measure the socioeconomic inequalities using logistic regression. |
| Tourni S, Zarezadeh M, Raadabadi M, Poursamarai F. (43) | Determining regional disparity of obstetrics and gynecology services and its association with children and infant mortality rates | A cross-Sectional Study | Satisfactory | Gini Coefficient |
| Enterzamahodi R, Majzadeh R, Forouzani AR, Nasahi M, Lamei A, Naieni KH.(44) | To measure inequality of disability in leprosy | A cross-sectional study | Good | extended concentration index decomposition |
| Moradi G, Mohammad K, Majzadeh R, Ardakani HM, Naieni KH.(45) | To determine socioeconomic inequalities in risk factors for NCDs | A trend analysis of inequality | Good | Concentration Index |
| Naghd S, Ghiasvand H, Zadeh NS, Azami S, Moradi T.(46) | To estimate the impact of some macro-economic factors specially inequality factors on the Iranian rural health status | A time trend ecological study | Satisfactory | Gini Coefficient |
| Kiadaliri AA.(47) | Investigating social disparities in breast cancer (BC) and ovarian cancer (OC) incidence rates among women | A time trend province-level study | Satisfactory | rate ratio and Kunst and Mackenbach relative index of inequality were used to assess social disparities |
| Kia AA, Rezapour A, Khoorsavi A, Abarghouei VA.(48) | To assess the socioeconomic inequality in malnutrition in under-5 children | A crossectional study | Good | Concentration Index |
| Moradi G, Moinafshar A, Adabi H, Sharafi M, Mostafavi F, Bolbanabad AM. (49) | To evaluate socioeconomic inequalities in the oral health status | A crossectional study | Satisfactory | Concentration Index |
| Kiadaliri AA, Asadi-Lari M., Kalantari N, Jafari M, Mahdavi MRV, Faghihzadeh S.(50) | To examine educational inequalities among adults | A population based cross-sectional study | Good | Slope Index of Inequality (SII) and the Relative Index of Inequality (RII) |
| Emamian MH, Zareihi H, Majzadeh R, Sharati M, Hashemi H, Fotouhi A.(51) | To explore inequality in visual impairment | A cohort study | Good | Blinder-Oaxaca decomposition |
| Hosseini M, Olyaeeanesh A, Ahmadi B, Nedjat S, Farzadi F, Arab M, et al. (52) | To identify the state of gender equity in the health sector of the Islamic Republic of Iran | A mixed method | Satisfactory | Gender Inequality in different aspects of health indicators |
| Moradi G, Majzadeh R, Mohammad K, Malekzadeh H, Jafari S, Holakouie-Naieni K. (51) | To determine the status of diabetes socioeconomic inequality and the share of determinants of inequalities | A time trend comparative study | Good | Concentration Index |
| Emamian MH, Fateh M, Gorgani N, Fotouhi A. (53) | To describe the socio-economic inequality in stunting and its determinants | A cross-sectional population-based study | Good | Oaxaca-Blinder Decomposition |

increased total hospital beds in Iran (132, 133), the equitable distribution of secondary care resources still remains a big challenge across the country, particularly the remote and marginalized areas. The latter needs great caution to balance the significant costs to improve access at the price of enhancing fair access (75, 82, 134). As for health financing, the inequality in the distribution of health care costs and households’ high exposure level to significant costs of
health care were extensively considered in many studies. We found an unfavorable status of FFCI (concentration, Gini coefficient, and Kwakwanni) indices and exposure to health catastrophic costs in the course of the past 2 decades

| Table 2 | Ctd |
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| Author(s) | Aims | Study Design | Newcastle-Ottawa Scale | Main outcome(s) |
| Rasaei A, Meibodi M, Darabi H, Nabipoor L, Larijani B, Mehdiabadi N, et al. | To investigate the socioeconomic inequality of overweight and obesity among the elderly | Prospective cohort study | Good | Concentration Index and the Lorenz curve |
| Saffari S, Keshavarz H, Hesmat M, Rahimi A, Jalali A, Ghassamian A, et al. | To describe the socioeconomic inequality associated with oral hygiene behavior | A cross-sectional Study | Good | Concentration Index (C) and the slope index of inequality (SII) |
| Peykari N, Djalalnia S, Qorbani M, Sabahi S, Farzadfar F, Larijani B. | Summarizing evidences on associations between socioeconomic factors and diabetes in Iranian population | A systematic review | Good | The prevalence of diabetes among different socioeconomic and demographic groups. |
| Ravaghi H, Ghoormacht M, Olyaei Ma- nesh A, Abolaheh N, Arabio J. | Obtain a deeper understanding of the development of health equity indicators and identify their implementation challenges | A qualitative study | Satisfactory | Shaping the stakeholder’s perspective for different health equity indices |
| Satory A, Pourasrour M, Saeedi S, Ayati M, Habaieh M, Khosravani M. | To determine and prioritize the social determinants of health inequality in Iran | A mixed method | Good | Shaping framework for including SDH approach in health equity |
| Beheshtian M, Mansooli AO, Bonakdar S, Afzali FM, Larijani B, Hoseini L, et al. | Determining health equity indicators in Iran | A literature review | Satisfactory | “52 indicators have been determined as health equity indicators in five areas including health, social and human development, economic development, physical environment and infrastructure and governance.” |
| Sadeghpoor Roudsari H, Sherafat Kazemzadeh R, Rezaie M, De- rakhamand M. | To assess the knowledge, attitudes and practices of men, Iranians and Afghan refugees, regarding reproductive health | A cross-sectional Study | Satisfactory | Mean scores for knowledge, attitudes and practices for Iranians were 4.38/30, 13.89/20 and 12.99/31 respectively; for the Afghans the scores were 3.79/30, 11.66/20 and 11.88/31. |

| Table 3 | Summary of articles focusing on equity in healthcare utilization |
| --- | --- |
| Author(s) | Aims | Study Design | Newcastle-Ottawa Scale | Main outcome(s) |
| Bidgoli HH, Boga L, Hassebliz M. | To assess the distribution of pre-hospital trauma care facilities reflect the burden of Road Traffic Injury (RTI) and Mortality (RTM) | Cross-Sectional Ecological Study | Good | Lorenz curves and Gini coefficients |
| Mohammadi Beigi, A, Hassanzadeh J, Esfehn B, Rezaiea A, et al. | To investigate and decompose the determinants of healthcare utilization (HCU) | Cross-Sectional Population based | Good | Decomposing Inequality |
| Mohammadi Beigi, A, Hassanzadeh J, Esfehn B, Rezaiea A, et al. | To determine and compare the socioeconomic inequity in HCU by CI and odds ratio (OR). | Cross-Sectional Population based | Good | Concentration Index |
| Noroozi M, Rahimi E, Ghavand H, Qorbani M, Shari afi H, Noroozi A, et al. | To explore the relative contributions of inequality in utilization of NSPs and to decompose it to its determinants | Cross-Sectional Ecological Study | Good | Decomposing Inequality |
| Darvi M, Marcy MR, Aslani A, Banikhaloeidizadeh Z, Khorasani E. | To evaluate the equity in access to pharmaceutical services | Cross-Sectional | Good | Concentration and Lorenz curves. |
| Ramandi SD, Naikian L, Aboutorabi M, Noroozi H, Javaherian M. | To determine how doctors, paramedics and hospital beds are distributed in Iran | Trend Analysis | Satisfactory | Gini Coefficient |
| Kianidi AA, Najafi B, Haghparast-Hidjoli H. | To evaluate the distribution of need and access to health care services among Iran's rural population | Cross-Sectional Ecological Study | Good | Lorenz Curve, Gini Coefficient, Dr of Dissimilarity |
| Kavosi Z, Mohammadbeigi A, Ramezani-Doroud Y, Hafizan N, Jafari A, Firoozjahangi A. | To measure horizontal inequality in access to out-patient services | Cross-Sectional Population based Survey | Good | Concentration Index |
| Kariani AK, Azami SR, Rezaei S, Shaahmad F, Ghazanfari S. | To investigate the geographical distribution of gynecologists and midwives and to determine their distribution trend | Cross-Sectional | Satisfactory | Gini Coefficient |
| Meshkini AH, Kherabrazeezadi A, Janghorban MR, Keshavarz K, Nikfar S. | To analyze the geographic distribution and accessibility of pharmacies in the municipal territory for both pedestrians and drivers | A cross-sectional geographic based study | Good | straight-line distance measurements |
| Hijaziadeh M, Connelly LB, Butler JR, Khosravi A. | To determine inequities of health care utilization | A cross-sectional population-based study | Good | Concentration Index |
| Noroozi M, Shirani H, Noroozi A, Rezaei F, Bahramishah H, Az- moon B. | To explore the contribution of economic status to inequality in unprotected sex among people who inject drugs (PWID) | A cross-sectional behavioral survey in Tehran | Good | Horizontal Inequality Index |
| Givanadi S, Najafi M, Rajaei R, Mahmoudi S, Pakdaman M. | To compare the distribution of burn beds with its disability-adjusted life years (DALY) in Iran | A cross-sectional study | Satisfactory | Gini Coefficient |
| Setifialdadi SE, Arab M, Ghia- zanfari S, Kazemi Z, Rezaei S, Kariani AK. | To determine the trend of inequality in the allocation of human resources in the health sector | A cross-sectional study | Satisfactory | Gini Coefficient |
| Honamandi R, Mohshidifar M, Kavosi Z. | To determine distribution of maternal and child health related workforce | A cross-sectional study | Satisfactory | Gini Coefficient |
| Moradi LM, Ramezani M, Naghavi M. | To determine the equality in safe delivery indices, i.e., appropriate place of delivery, type of delivery and skilled attendant for their delivery, and their determinants in Iran. | A cross-sectional study | Good | Concentration Index for appropriate normal vaginal delivery and skilled liver |
| Mesgarpoor-Amirli M, Mehdizadeh P, Barouei M, Dopeykar N, Ramezani M. | To determine the trend of inequality in the distribution of intensive care beds | A cross-sectional study | Satisfactory | Gini Coefficient for ICU and ICU |
| Jadidi R, Mohammadbeigi A, Mohammadi N, Ansari H, Ghaderi E. | To evaluate the inequity in timely vaccination with a focus on inequities in timeliness | A historical cohort study | Good | Concentration Index of mother an for timely vaccination |
| Massoudi M, Rahimzadeh M. | To investigate geographical accessibility of residential areas to health services | A cross-sectional geographical information system | Good | Floating Catchment Area (FCA), methods and Response Time (RT) |
| Emanian MH, Zeraati H, Maj- dizadeh R, Shariati M, Hashemi H, Fetalou A. | To assess the role of economic inequality in the utilization of eye care services, and to identify its determinants. | A cross-sectional population-based study | Satisfactory | Oaxaca-Blinder Decomposition of inequality in the allocation of human resources in the health sector |
| Afrini Hadi M, Ghasemi A. | Inequalities between general physicians’ (GP) and specialists’ visits; also, the factors effecting the utilization of visits were determined | A cross-sectional study | Satisfactory | Oaxaca-Blinder Decomposition of inequality in the allocation of human resources in the health sector |
| Afrozehbad M, Bayati M. | To investigate the inequality and trend of geographic accessibility to Pediatrics | A time trend analysis | Satisfactory | Gini Coefficient and Index of Dissability to pediatrics |
| Kazemi Kariany A, Kazemi Z, Shahnafidi F, Aref T, Ghazanfari S. | To analyze inequities of health care utilization | A cross-sectional behavioral survey in Tehran | Satisfactory | Gini Coefficient |

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in Iran. Despite notable OOP reduction after the HTF implementation, the still high OOP remains a considerable challenge in Iran. Also, citizens in lower socioeconomic quintiles maybe prone to more severe financial hardship due to health expenses, all of which demand greater atten-
| Citation | Aims | Study Design | Newcastle-Ottawa Scale | Summary Results |
|----------|------|--------------|-------------------------|-----------------|
| Khamarnia M, Keshikar A, Kavosi Z, Hayati R. (102) | To investigate the households’ impoverishment due to the healthcare costs | A cross-sectional study | Satisfactory | Health care expenditureishing effect |
| Delavari H, Keshikar A, Setoudehzadeh F. (103) | To determine the percentage of households with cancer patients that face catastrophic health expenditures. | A cross-sectional study | Satisfactory | Catastrophic health expenditure |
| Kavosi Z, Rashidian A, Pourreza A, Majdizadeh R, Pourmalek F, Hosseinpour AR, et al. (104) | To assessed change in household catastrophic health care expenditures | A longitudinal population-based study | Good | The proportion of households facing catastrophic health expenditure (CHE) |
| Fazlizadeh AA, Seyedin H, Moghaddam AV, Delavari A, Salizadeh H, Varmazyar H, et al.(105) | To present a trend analysis for the indicators related to fairness in healthcare’s financial burden | A time trend study | Satisfactory | “The percentage of people in astrophic Health Expenditure Fairness in Financial Contro |
| Juyani Y, Hamedi D, J ebeli SSH, Qasham M.(106) | To investigate on what extent Multiple sclerosis patients face catastrophic costs. | A cross-sectional study | Satisfactory | Ratio of catastrophic costs |
| Hajizadeh M, Connelly LB.(107) | To examine the progressivity of health insurance premiums and consumer co-payments | A time trend analysis | Good | Kakwani Progressivity Index |
| Hajizadeh M, Nghiemen HS.(108) | To examine the progressivity of health insurance premiums and consumer co-payments | A cross-sectional study | Good | out-of-pocket expenditure and the related cata |
| Reshadat S, Najafi F, Karami-Matin B, Soofi M, Barfar E, Rajabi-Gilan N, et al. (109) | To measure the financial protection against CHE among hospitalized patients | A cross-sectional study | Satisfactory | Mean of Out-Of-Pocket Pay |
| Ghoorbanian A, Rashidian A, Lankarani KB, Kavosi Z. (110) | To estimate the pooled prevalence of CHE in Iran and identifying | A systematic review and meta-analysis | Good | Pooled Prevalence of Catastrophic Health Expenditure |
| Ghoddossinejad J, Jamati A, Gholiipour K, Baghestan EB.(111) | To calculate households encountered with catastrophic healthcare expenditures. | A cross-sectional study | Satisfactory | Rate of households encountering catastrophic health expenditures |
| Mansouri A, Emanian MH, Zeraati H, Hashemi H, Fotouhi A.(112) | To estimate and decompose economic inequality in presenting visual acuity | A cohort study | Good | Concentration Index |
| Kavosi Z, Keshikar A, Hayati R, Ravargar R, Khamarnia M. (113) | Investigated the Household Financial Contributions to the health system | A cross-sectional study | Good | Fairness Financial Cont Index |
| Piroozi B, Moradi G, Nouri B, Bollbanabad AM, Safari H. (114) | Explore the percentage of households facing the inequality and determinants of the CHE for hospital services | A cross-sectional study | Good | Catastrophic Health Expend |
| Rarani MA, Rashidian A, Khosravi A, Arab M, Abbassian E, Morasae EK.(115) | Decompose inequality in neonatal mortality into its contributing factors | A comparative longitudinal study | Good | Inequality in neonatal mortality normalized Concentration Inc |
| Daneshkohan A, Karami M, Najafi F, Matin BK.(116) | To estimate FFCI and quantify extent of catastrophic household heath expenditures | A cross-sectional study | Good | The proportion of households facing catastrophic health expenditure |
| Moghadam MN, Banshi M, Javar MA, Amirnesmaili M, Ganjiavi S.(117) | Measure percentage of Iranian households exposed to catastrophic health expenditures | A cross-sectional study | Good | Catastrophic Health Expend |
| Abolhallaie M, Hasanli S, Bastani P, Ramezanian M, Kazemian M.(118) | To identify measures of fair financing of health services and determinants of fair financing contribution | A cross-sectional study | Satisfactory | Rate for Out of Payments health expenditure |
| Ghiasvand H, Naghdi S, Abolhassani N, Shaarabafchizadeh N, Moghiri J.(119) | This study investigated the Iranian rural and urban households’ inequality in payments on food and OOP health expenditures | A cross-sectional time trend study | Good | Concentration Indices for F Health Expenditure |
| Ghaffoori MI, Eshafidard Azar F, Arab M, Mahmoodi M, Yusuf Zadeh N, Rezapour A.(120) | To determine disparities in health expenditures by means of different approaches | A cross-sectional population-based study | Satisfactory | Fairness in Financial Contro |

**Study limitations**

Health equity includes a vast range of topics; 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 health equity to achieve better results. We considered all aspects of health equity.

**Table 4. Ctd**

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Table 4. Ctd

| Citation | Aims | Study Design | Newcastle-Ottawa Scale | Summary Results |
|----------|------|-------------|------------------------|-----------------|
| Anbari Z, Mohammadbeigi A, Mohammadmaleki N, Ebrazeh A.(121) | Evaluating some health expenditure of inpatient and outpatient care as well as assessing the predictors of catastrophic costs for inpatient care | A cross-sectional study | Good | Catastrophic Costs Ratio |
| Rezapour A, Vahedi S, Khiavi FF, Esmaeilzadeh F, Javan-Noughabi J, Rajabi A.(122) | Analyzing CHE among households with and without chronic NCDs | A cross-sectional study | Satisfactory | The Catastrophic Health Expenditure incidence and intensity in the households with chronic NCDs |
| Ghiavand H, Gorgi HA, Maleki M, Hadian M.(13) | To explore the mean of OOP payments among Iranian households for health services and the level of inequality in its distribution | A cross-sectional study | Good | The Catastrophic Health Expenditure headcount ratio |
| Rezapour A, Azar FE, Aghdash SA, Tanoonmand A, Ahmadzadeh N, Asahkar AS.(123) | To assess the inequality in household's capacity to pay and OOP health care payments Measuring equity in household’s health care payments according to FFCI and Kakwani indices | A cross-sectional study | Good | Concentration Index for household’s Out-of-Pocket payments “The Fairness in Financial Contribution Index for households in health financing The Kakwani index |
| Ghiavand H, Sha’baninejad H, Arab M, Rashidian A.(125) | To calculate the proportion of hospitalized patients exposed to catastrophic medical payments | A cross-sectional study | Good | Ratio and likelihood of exposure to Catastrophic Health Expenditure |
| Ibrahimipour H, Maleki M-R, Brown R, Gohari M, Karimi I, Dehnavieh R. (126) | To understand the Iranian health financing system and provide lessons for policy makers about achieving universal coverage | A qualitative study | Good | There are seven major obstacles to universal coverage: unknown insured rate; regressive financing and non-transparent financial flow; fragmented system; non-scientifically designed benefit package; non-health-oriented and expensive payment system; uncontrolled demands; and administrative deficiency” |
| Naghd S, Moradi T, Tavangar F, Bahrami G, Shahboulaghi M, Ghiavand H.(127) | Investigating barriers to develop financial protection as a requirement to achieve universal health coverage | A qualitative study | Satisfactory | “The major themes included the political, social and economic context of the country, the context and structure of healthcare system and dimensions of UHC” |

analysis in Iran, but extracting, summarizing, and reporting the retrieved evidence was a major challenge. Therefore, we have organized our research plan based on the current approaches of World Bank researchers. We used their classification approach for different topics in health equity analysis.

In addition, although primarily we ran search on the published studies in Persian language, based on our initial presumption and then the assessment of the retrieved studies, we decided to ignore them.

**Implications for Future Research**

We advocate the use of SDH perspective and other factors that affect health, including genetic and biological factors, food and nutrition, environmental and social factors, and even the impact of social and economic macro policies of the governments on health in studying health inequalities. Unless researchers study health inequalities through comprehensive lenses that accommodate social aspects, meaningful tackling of such inequalities towards sustainable health development might be compromised.

**Conclusion**

This systematic review aimed to shed light on the various factors that contributed to health inequalities in Iran. Many studies approached the issue from the lenses of health system and focused on outcomes, utilization, and financial domains of inequalities as the main challenges to equity. Yet, the literature is tiny to accommodate the social problems that may be the cause of inequality in Iran. For instance, social issues such as unemployment, divorce, child labor,
living in slums, and homelessness, which might be the consequences of social inequalities, need to be addressed while analyzing health inequalities in any settings. In fact, policymakers in Iran need to develop directions in their health equity research priorities toward containing the factors that are not necessarily within the health system. Encouraging interdisciplinary research projects with sociologists as an urgent need.

Conflict of Interests

The authors declare that they have no competing interests.

Ethics approval and consent to participate: IR.TUMS.

VCR.REC.1397.230.

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Appendix

Search strategy:

- PubMed/MedLine:

  (((((((((((((((帕"health"[MeSH Terms] OR "health"[All Fields]) OR ("delivery of health care"[MeSH Terms] OR ("delivery"[All Fields] AND "health"[All Fields] AND "care"[All Fields]) OR "delivery of health care"[All Fields]) OR "health care"[All Fields])) OR ("health services"[MeSH Terms] OR ("health"[All Fields] AND "services"[All Fields]) OR "health services"[All Fields])) OR (("health"[MeSH Terms] OR "health"[All Fields]) AND outcome[All Fields])) OR ("health"[MeSH Terms] OR "health"[All Fields] AND consequences[All Fields])) AND equity[All Fields]) OR equality[All Fields]) OR disparity[All Fields]) OR "socioeconomic factors"[MeSH Terms] OR ("socioeconomic"[All Fields] AND "factors"[All Fields]) OR ("socioeconomic factors"[All Fields] OR "inequality"[All Fields]) OR inequity[All Fields]) OR accessibility[All Fields]) OR availability[All Fields]) OR acceptability[All Fields]) OR ("statistics and numerical data"[Subheading] OR ("statistics"[All Fields] AND "numerical"[All Fields] AND "data"[All Fields]) OR "statistics and numerical data"[All Fields] OR utilization[All Fields]) OR ("health expenditures"[MeSH Terms] OR ("health"[All Fields] AND "expenditures"[All Fields]) OR "health expenditures"[All Fields] OR "expenditure"[All Fields]) OR ("compensation and redress"[MeSH Terms] OR ("compensation"[All Fields] AND "redress"[All Fields])) OR "compensation and redress"[All Fields] OR ("payment"[All Fields]))) OR horizontal[All Fields]) OR (vertical[All Fields] AND equity[All Fields])) OR (vertical[All Fields] AND equity[All Fields])) AND ("iran"[MeSH Terms] OR "iran"[All Fields])

- Cochrane Library:

  #1 Health
  #2 Health Services
  #3 Health Care
  #4 Health Outcomes
  #5 Health Consequences
  #6 Health System
  #7 Health Resources
  #8 Availability
  #9 Accessibility
  #10 Utilization
  #11 Expenditure
  #12 Payments
  #13 Equity
  #14 Inequity
  #15 Equality
  #16 Inequity
  #17 Fairness
  #18 Disparity
  #19 Acceptability
  #20 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7
  #21 #8 OR #9 OR #10 OR #11 OR #12
  #22 #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19
  #23 #20 AND #21 AND #22