Equity in the quality of hospital services in Iran

Leila Jamshidi[1], Mozhdeh Ramezani[2]*, Seyed Sajad Razavi[3], Leila Ghalichi[4]

Abstract
Background: Providing fair access to high-quality healthcare services is one of the most important goals of health systems. This study was conducted between 2012 and 2013 to determine the level of equity in the quality of hospital services in Iran.

Methods: In this cross-sectional study, 1,003 patients were chosen from 100 hospitals in Iran with multi-stage random cluster sampling. Concentration index was calculated to determine equity of healthcare quality from patients' viewpoint. Furthermore, the equity of hospital services' quality was investigated from experts' perspective by calculating Gini index based on the hospitals' accreditation scores. Analyzing the related factors was done by logistic regression. The significance level was set at $\alpha=0.05$. Data were analyzed using Excel v.2010, SPSS v.21, and Stata v.8.

Results: There was a significant inequity in the quality of hospital services in both patients' and experts' point of view. In fact, concentration index (95% confidence interval) for the quality of healthcare was significant, 0.128 (0.080, 0.176), indicating better quality of services for those with higher economic status from patients' point of view. Furthermore, Gini index (95% confidence interval) for hospitals' accreditation scores was 0.166 (0.156, 0.176), meaning that there was inequity in hospital services quality from experts' point of view.

Conclusion: The significant inequality observed in the quality of hospital care based on the economic status of the patients highlights the necessity of the supportive policies aiming at reduction of this condition.

Keywords: Equity, Equality, Quality, Socio-economic status, Iran, Hospital, Healthcare services

Introduction

The World Health Organization introduced three substantial objectives for health care systems in its annual 2000 report: "Improving the health of the population they serve, responding to people expectations, and providing financial protection against the costs of ill-health." Furthermore, the report emphasized that for achieving the goals mentioned above, governments should make proper policies to motivate public and especially private health sectors to improve quality, equity, and efficiency of services (1).

Experts have defined equity in health as "the absence of systematic disparities in health (or in the major social determinants of health) between groups with different levels of underlying social advantage/disadvantage—that is, wealth, power, or prestige." (2) Institute of Medicine published two reports regarding inequity in the quality of health services for minorities: "Crossing the quality chasm: a new health system for the 21st century," and "Unequal treatment: confronting racial and ethnic disparities in healthcare." (3,4) Hasnain et al. assessed racial/ethical differences in hospital quality measures on 320,970 patients from 123 hospitals in the United States between 2002-2005. They found that there are significant disparities between minority and non-minority patients (5).

Stepurko et al. measured consumer satisfaction regarding quality and responsiveness of health services in six central and eastern European countries (Bulgaria,

Corresponding author: Dr Mozhdeh Ramezani, ramezani93146@yahoo.com

[1.] Mental and Social Health office, Ministry of Health, Tehran, Iran.
[2.] Preventive Medicine and Public Health Research Center, Department of Community Medicine, Iran University of Medical Sciences, Tehran, Iran.
[3.] Department of Anesthesiology, Mofid Pediatric Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
[4.] Mental Health Research Center, Iran University of Medical Sciences, Tehran, Iran.

↑What is "already known" in this topic:
There is some evidence of unfairness in healthcare services in the world. However, this is the first study to measure injustice in the quality of hospital services in Iran at the national level.

→What this article adds:
The investigation revealed significant inequity in the quality of hospital services in both experts and patients' point of view between 2012 and 2013. Furthermore, the study showed the better-perceived quality of services for patients with higher economic status.

Hungary, Lithuania, Poland, Romania, and Ukraine) in 2010. The authors found that the average rate of satisfaction is relatively high, but there are doubts about the equity of health services, especially regarding informal payments, and ability to pay the cost of services (6).

Noori et al. studied the impacts of Socio-Economic Status (SES) on congestive heart failure-related readmission as a quality indicator in 312 patients in Iran between 2010-2011. They indicated the relation between low SES and the increasing rate of readmission (7).

Based on Iran's Constitution, articles 19 and 29, having equal rights for people of different races, languages, and ethnic groups as well as having access to healthcare services such as insurance is a public right (8). Inequality in access to high-quality health services is an important issue. This injustice can result from several determinants such as inequality in access to healthcare, socio-economic status, lack of insurance, and not having constant care, such as routine physician visits, lack of financial resources, legal barriers, and structural obstacles among others (2).

Todays, hospitals are the most expensive centers for providing diagnosis, treatment and rehabilitation services. Thus, strategic planning to improve the quality and fairness of these centers is vital to creating and maintaining the health status of people. As a result, there is an essential need for measuring the current situation of quality and equity of health services, such as hospitals, with proper methods (9). This study was conducted to determine the equity of hospital services' quality in Iran.

Methods

In this cross-sectional study, equity of the quality of hospital services was assessed in two ways: 1) based on experts' point of view using hospitals' accreditation scores, and 2) based on patients' perspective, who have received the services.

Sampling

In the first method, we used the accreditation scores of all 875 hospitals in the country that were given by Ministry of Health between 2012- 2013. In the second method, 1,003 patients from 100 hospitals in different parts of Iran were chosen, with the assumption of 70% for the quality of services and 1.2 design effect.

The Iranian Ministry of Health evaluates the quality of hospitals' service regularly, based on national accreditation standards. The accreditation scores from years 2012-2013 (presented as a percentage) were used in this study to reflect the quality of service according to experts' point of view (10).

The sampling method was a multi-stage random cluster sampling. First, all military and charity hospitals were excluded from the list. Regarding the charity hospitals, there are specific discounts and benefits in these hospitals which could be different from non-charity hospitals. Also, in military hospitals, there are some security considerations which would be an obstacle for answering all of the questions as well as various financial procedures.

Next, we randomly selected a number between 1 and

875 from the list of all hospitals. The second hospital was chosen 100 hospitals after the first one in the list. When we reached the end of the list, we continued counting from the beginning up to 100. We continued in this way until we chose 100 hospitals around the country as clusters. After that, trained interviewers who were hospital inspectors at different medical universities of Iran went to the selected hospitals in their region. In each hospital, they randomly picked ten patients from various wards who had stayed in the hospital for at least 48 hours. The goal of the study was described for the participants, and they were assured that their responses would remain confidential and have no effect on the process of their treatment, nor on the accreditation score of the hospital. After receiving the interviewees' consent, the interviewers started asking the questions to determine patients' perspective on the quality of services. Participants were asked: "In your opinion, how is the quality of services in this hospital?" and they could answer in a five scale Likert. For calculating inequity, the answers, were categorized into a binary variable of quality, so very bad, bad and moderate were classified as "inappropriate quality" and good, and very good were considered as "appropriate quality."

The independent variables were hospitals' characteristics (number of beds, public or private, specialized or general, and teaching or non-teaching), demographic information (age, sex, occupation, education, and place of living), and insurance status (basic and supplementary health insurance). Also, we assessed patients' economic situation (monthly income, the number of rooms per capita, and some variables for calculating asset index). As there is a general tendency in inaccurate reporting of monthly income, asset index was used to determine the economic status. Asset index is a surrogate variable of economic status (11, 12). For calculating asset index, we used some related asset variables based on Demographic Health Survey that was performed in Iran in 2010. The variables were: having a color TV, car, telephone, mobile phone, dishwasher, washing machine, vacuum cleaner, microwave, PC or laptop, internet access, and the number of rooms per capita (13). Based on the achieved asset index, as a quantitative variable, the economic status of all patients was ranked and categorized into five equal quintiles (each quintile consisted of 20% of the studied patients). The first and last quintiles had the worst and the best economic status, respectively (14).

Analysis

We described variables in numbers, percentages, mean, and 95% confidence interval. To measure equity in the quality of hospital services in the first method (experts' point of view), we calculated Gini index and 95% confidence interval. Gini is a coefficient between 0 and 1. A Gini coefficient equal to zero shows that there is no inequality in the outcome variable (quality of hospital services in this study). On the other hand, a Gini coefficient equal to 1 indicates the worst situation of inequality (15, 16).

To analyze equity in the second method, patients' perspective, we used concentration index and 95% confi-

dence interval. Concentration index gives an estimate of the socio-economic inequalities of outcome variables, quality of hospital services in this study. Concentration index lies between (-1, +1). The index equal to zero means complete equality. In contrast, negative values show that the outcome variable is more among poorer people, and positive values indicate the reverse situation (17, 18). Furthermore, we used Newey-West Regression method to calculate the 95% confidence interval for concentration index (19). Analyzing the related factors was done with logistic regression. The analysis was conducted using Excel, SPSS, and Stata.

Ethics

Since the accreditation scores are performed by the Ministry of Health and Medical Education of Iran, permission was granted before using them in this study in 2013. Also, all participants were ensured that their information would be held confidential.

Results

In this study, 1,003 patients from 100 hospitals from different parts of Iran were interviewed. The mean and standard deviation of participants' age was 45.9±18.1 years. Table 1 shows demographic characteristics of the patients. Furthermore, 923 participants (91.9%) had basic health insurance, and 287 people (28.6%) had supplemental health insurance.

The hospitals' bed mean and standard deviation was 275±200. Regarding the type of hospitals, there were 76.9% public-governmental, 8.5% private, and 14.6% public-nongovernmental hospitals. Also, 42% of the hospitals were teaching, and 58% were non-teaching hospitals. In addition, general hospitals were 79.9%, and specialized hospitals were 20.1%.

The quality of the received services was entirely satisfactory (good and very good) according to 36.5% of the patients' answers (Table 2).

The logistic regression showed that the perceived quality of services increased significantly with the rise of participants' age and hospitals' accreditation scores. In contrast, the quality had an indirect relationship with the number of beds in the hospitals. Furthermore, perceived quality was significantly higher in non-teaching hospitals compared with teaching hospitals (Table 3). The other independent variables had no significant relationship with perceived quality of hospital services.

According to equity analysis, concentration index was 0.128 (0.080 – 0.176) which is showing that the perceived quality of services by the patients was significantly unequal and the quality of services was more for affluent patients. In addition, Gini index of the hospitals' accreditation score was 0.166 (0.156–0.176) which means there is significant inequality in hospitals' quality in experts' point of view.

Discussion

This study shows that there is a significant inequity in the quality of hospital services in Iran based on both patients' and experts' points of view. Also, due to the positive concentration index, the quality of healthcare services is different in the various economic groups. Thus,

Table 1. Demographic information of the participants

Independent variables	Number (%)
Sex	
Man	444 (44.2%)
Woman	559 (55.8%)
Occupation	
Unemployed (jobless without income)	126 (12.5%)
Student	41 (4.1%)
Housewife	437 (43.6%)
Employed (or unemployed with income)	399 (39.8%)
Education	
Illiterate	262 (26.5%)
Primary school	211 (21.0%)
Secondary school	138 (13.7%)
High school	229 (22.8%)
University	163 (16.0%)
Living place	
Village	267 (26.6%)
City	736 (73.4%)
Average monthly income (Rial)	
Less than 2,500,00 0	182 (18.1%)
2,500,000- 5,000,000	260 (25.9%)
5,000,000- 10,000,000	411 (41.0%)
10,000,000- 20,000,000	129 (12.9%)
More than 20,000,000	21 (2.1%)

Table 2. Description of participants' perspective regarding quality of hospital services

The quality of healthcare service from patients' points of view	Number (%)
Very bad	12 (1.2%)
Bad	58 (5.8%)
Moderate	568 (56.5%)
Good	289 (28.9%)
Very good	76 (7.6%)

Table 3. Results of logistic regression regarding effective factors on hospital healthcare quality in patient's perspective

Independent variables	Quality of services Odds Ratio (95% confidence interval)	p
Age	1.008 (1.001 – 1.016)	0.039
Number of hospital beds	0.998 (0.997 – 0.999)	0.033
Hospitals' accreditation scores	1.021 (1.010- 1.033)	0.001
Hospital activity	0.635 (0.463- 0.870)	
Teaching		0.005
Non-teaching (reference group)		

the more affluent economic groups have reported higher perceived quality of services.

After adjusting the effects of variables in multivariate analysis, we found that the quality of hospital services has a significant association with patients' age, hospitals' accreditation scores, number of beds in the hospitals and hospital activities (teaching or non-teaching). In fact, higher quality of health services has been reported with an increase in patients' age and hospitals' scores. In contrast, teaching hospitals and a higher number of beds were associated with lower perceived quality. One of the reasons might be that with increasing age, people become more tolerant toward difficulties. Also, the quality of care in Iran's hospital has improved in a recent decade, as well as many other health indicators (20), which may have affected the evaluation of older patients who had a higher chance of previous experience of hospitalization.

Hicks et al. used a nationwide inpatient sample (2002-2009) which showed that young black patients have significantly less survival rate after trauma than older black patients. They could not explain the reason for this age-racial disparity. This age-related inequality in the quality is consistent with our results (21).

Concerning the number of beds, although bigger hospitals with a higher number of beds have received more accreditation scores by the Ministry of Health, perceived quality by the patients has been weak in hospitals with a greater number of beds. Also, teaching hospitals have been associated with lower levels of perceived quality. In fact, public and bigger hospitals are more crowded, because of a reduced cost and variety in specialties. Moreover, most of them are teaching hospitals which mean patients may be concerned about lack of adequate supervision on students. On the other hand, higher accreditation scores were associated with more perceived quality. This consistency can show that quality improvement in hospitals had been detected by both patients and experts.

Place of residence might affect the equity in quality of service through various pathways, with lower quality experienced by low-income residents of inner-city neighborhoods as well as suburb residents (22). In our study, the living place had no significant association with the received healthcare services. This finding shows that Iran's health system has somehow managed to avoid this kind of inequity. It can be due to the relatively proper rationalization of the hospital services.

Pinder et al. used data from a national cancer patient experience survey in England (2012-2013), that they assessed the patient-reported experience of doctors and nurses' behavior. Their results showed that there is lower satisfaction in ethnic minority patients. Furthermore, some parts of this inequality were related to socioeconomic variation, similar to our results (23).

McGrail et al. studied the healthcare inequities related to economic status in the United States and Canada. Their results showed that, in general, the mean of health status is lower in the United States compared to Canada but this is not significant, but the inequality of health curve in Canada was less than the United States (24). Hence, being a developed country and having a rich economy does not necessarily result in equal access to healthcare services for the entire population in a country. Factors such as the system of providing health services and health insurance are quite influential in reducing health inequality.

In an analytical-descriptive study by Moradi et al. based on data from the Demographic and Health Survey, 17,991 married women between 10 to 49 years old were investigated in 2000. Their finding indicated that for women with better economic status, more deliveries are done at an appropriate location with the help of the right person. These results are in agreement with our findings regarding socioeconomic inequity (14).

The strength of our study was an investigation of unfairness in both patients' and experts' perspective at the national level. Also, there were some limitations. In this study, we did not investigate charity and military hospitals because they could introduce bias to our findings due to their particular financial condition and other reasons mentioned in the method section. Furthermore, due to the complexity of perceived quality by patients, we just asked a question about the quality of hospital services in general. In fact, developing a national standard questionnaire to assess perceived quality by patients could be an excellent way to achieve more accurate results in future studies.

Conclusion

There is significant unfairness in both experts' and patients' point of view in the quality of hospital services in Iran. Therefore, proper intervention and policies such as following universal coverage are vital to decrease health inequity. Furthermore, not only we need to know the existing situation of inequity but we should also investigate the trend of this injustice. As a result, developing studies with similar objectives to this study in defined intervals seems necessary, especially now that recent health system reform has been implemented in Iran.

Acknowledgement

Dr. Arash Rashidian for their valuable comments.

References

1. WHO. The World Health Report 2000. Health systems: Improving performance. Geneva: World Health Organization, 2000.
2. Braveman P, Gruskin S. Defining equity in health. J Epidemiol community Health 2003;57:254-258.
3. Hasnam-Wynia R, Baker DW, Nerenz D, Feinglass J, Beal AC, Landrum MB, et al. Disparities in health care are driven by where minority patients seek care. Arch Intern Med 2007;176:1233-1239.
4. Baker A. Crossing the quality chasm: a new health system for the 21st century. BMJ. 2001;323:1192.
5. Werner RM, Goldman LE, Dudley RA. Comparison of change in quality of care between safety-net and non-safety-net hospitals. JAMA. 2008;299 (18):2180-2187.
6. Stepurko T, Pavlova M, Groot W. Overall satisfaction of health care users with the quality of and access to health care services: a cross-sectional study in six Central and Eastern European countries. BMC Health Serv Res. 2016;16:342.
7. Noori A, Shokoohi M, Baneshi MR, Naderi N, Bakhshandeh H, Haghdoost AA. Impact of socio-economic status on the hospital readmission of Congestive Heart Failure patients: a prospective cohort study. Int J Health Policy Manag. 2014;395:251-257.
8. Algar H, editor. Constitution of the Islamic Republic of Iran. Mizan Pr 1980.
9. Wilunda C, Putoto G, Dalla Riva D, Manenti F, Atzori A, Calia F, et al. Assessing coverage, equity and quality gaps in maternal and neonatal care in sub-saharan Africa: an integrated approach. PLoS One. 2015 May 22;10(5):e0127827.
10. Teymourzadeh E, Ramezani M, Arab M, Rahimi foroushani A, Akbari Sari A. Surveyor Management of hospital accreditation program: a thematic analysis conducted in Iran. Iran Red Crescent Med J. 2016;18(5):e30309.
11. Rustein Shea O, Johnson K. The DHS Wealth Index. DHS Comparative Reports No. 6. Cleverton, Maryland: ORC Macro; 2004. Available from: https://dhsprogram.com/pubs/pdf/CR6/ CR6.pdf.
12. Ghalichi L, Nedjat S, Majdzadeh R, Hoseini M, Pournik O, Mohamad K. Determinants of Self-Rated Health in Tehran, from Individual Characteristics towards Community-Level Attributes. Arch Iran Med. 2015 May 1;18(5).
13. Rashidian A, Karimi-shahanjarini A, Khosravi A, Elahi E, Beheshtian M, Shakibazadeh E, et al. Iran's Multiple Indicator Demographic and Health Survey. 2010: study protocol. Int J Prev Med. 2014;5(5): 632-642.
14. Moradi-Lakeh M, Ramezani M, Naghavi M. Equality in safe delivery and its determinants in Iran. Arch Iran Med. 2007;10(4):446-451.
15. Asadi Y. Assessment of the health of Americans: the average health-related quality of life and its inequality across individuals and groups. PHM. 2005;3:7.
16. Rezapour A, Azar FE, Aghdash SA, Tanoomand A, Shokouh SM, Yousefzadeh N, et al. Measuring equity in household's health care payments (Tehran-Iran 2013): technical points for health policy decision makers. Med J Islam Repub Iran. 2015;29:246.
17. Koolman X, Van Doorslaer E. On the interpretation of a concentration index of inequality. Health Econo. 2004 Jul 1;13(7):649-56.
18. Regidor E. Measures of health inequalities: part 2. J Epidemiol Community Health. 2004;58:900-903.
19. Newey WK, West KD. Automatic lag selection in covariance matrix estimation. Rev Econ Stud. 1994;61:631-653.
20. Movahedi M, Haghdoost AA, Pournik O, Hajarizadeh B, Fallah MS. Temporal variations of health indicators in Iran comparing with other Eastern Mediterranean Region countries in the last two decades. Journal of Public Health. 2008 Sep 3;30(4):499-504.
21. Hicks CW, Hashmi ZG, Hui X, Velopulos C, Efron DT, Schneider EB, et al. Explaining the paradoxical age – based racial disparities in survival After Trauma. Ann Surg. 2015; 262:179-183.
22. Woolf SH. Progress In Achieving Health Equity Requires Attention To Root Causes. Health Affairs. 2017 Jun 1;36(6):984-91.
23. Pinder RJ, Ferguson J, Moller H. Minority ethnicity patient satisfaction and experience: result of the National Cancer Patient Experience Survey in England. BMJ Open. 2016; 6: e011938.
24. McGrail KM, Doorslaer EV, Ross NA, Sanmartin C. Income-related health inequalities in Canada and the United States: a decomposition analysis. Am J Pub Health. 2009;99(10): 1856-1863.