Equity in the quality of hospital services in Iran

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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 α=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’ viewpoint. 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/ethnic 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,
Equity in the quality

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).

To analyze equity in the second method, patients’ perspective, we used concentration 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, while a Gini coefficient equal to 1 indicates the worst situation of inequality (15, 16).

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 inequality, 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 the 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-
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,
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 inequity were related to socioeconomic variation, similar to our results (23).

McGrail et al. studied the healthcare inequalities 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

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**Table 2: Results of logistic regression regarding effective factors on hospital healthcare quality in patient’s perspective**

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Quality of services</th>
<th>Odds Ratio (95% confidence interval)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td>1.008 (1.001 – 1.016)</td>
<td>0.039</td>
</tr>
<tr>
<td>Number of hospital beds</td>
<td></td>
<td>0.998 (0.997 – 0.999)</td>
<td>0.033</td>
</tr>
<tr>
<td>Hospitals’ accreditation scores</td>
<td></td>
<td>1.021 (1.010- 1.033)</td>
<td>0.001</td>
</tr>
<tr>
<td>Hospital activity Teaching</td>
<td></td>
<td>0.635 (0.463- 0.870)</td>
<td>0.005</td>
</tr>
</tbody>
</table>

**Non-teaching (reference group)**
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Conflict of Interests
The authors declare that they have no competing interests.

References