Original Article

Equity in the Distribution of General and Specialist Practitioners of Ahvaz Jundishapur University of Medical Sciences

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Abstract

Fair distribution of physicians is a determining factor in health system policies. The present study aimed to investigate the equity in the distribution of general and specialist physicians in the affiliated cities of Ahvaz Jundishapur University of Medical Sciences. This descriptive cross-sectional study was performed in 2019. Population data were collected through the Statistics Center of Iran and The number of physicians was collected through the relevant departments of the university and the organizations of the medical and planning system of Khuzestan province in 2019. Then, using ratio indices, Gini coefficient, and Lorenz curve, the status of physicians distribution was investigated. Excel software was used to analyze the data.

Hendijan (0.5) and Haftkel (0.49) had the highest ratio of general practitioners to the population and Mahshahr port (0.11) had the lowest. The highest ratio of specialized physicians to the population was in Karun with 0.75 and the lowest ratio was in Bavi (0.04). The Gini coefficient of distribution of general practitioners, specialists, and all the physicians in the study population was 0.16, 0.31, and 0.19, respectively. The Lorenz curve showed the distribution of physicians and confirmed the Gini coefficients. The ratio of general practitioners and specialists to the population in the study population is low, but the distribution of general practitioners and all the physicians are fair and specialist physicians are unfair. Policymakers and university administrators should pay special attention to increasing the ratio of general practitioners and specialists to the population and the fair distribution of specialist physicians.

Keywords: Gini coefficient, Distribution, General practitioner, Specialist practitioner, Ahvaz university of medical sciences

Introduction

Equity in the distribution of health services is one of the most important issues related to health and is a major problem in the field of health and social inequality [1]. The concept of equity in health has different definitions, but all definitions revolve around the "fair distribution of everything, such as health services among different individuals and groups in society" [2]. Proper and optimal distribution of health services and resources increases speed, efficiency, and ease of access [1]. Regarding that health is one of the basic rights of every individual in society, governments are obliged to ensure it with equity and equality [3]. The availability of health system resources has a significant role in the justice and efficiency of the health system and achieving its main goals. However, the equitable distribution of health resources such as hospital beds, physicians, and nurses in the community is a prerequisite for achieving an acceptable level of health for all people [4]. Among the various resources, manpower is so important that equipment and facilities without access to efficient manpower cannot have much impact on public health [5] to the extent that its shortage and surplus can reduce the quality of services provided to patients. Therefore, the distribution of human resources in the health sector is one of the most important requirements for the promotion of health indicators, while achieving the goals of equity in health [6]. Also, a positive relationship between the equitable distribution of health resources and the health level of the covered population has been proven [3]. Among the human resources of the health sector, the number of physicians indicates the availability of labor and is one of the most common and fundamental policy issues in the health sector in the field of specialists in developing countries,

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including Iran [7, 8]. On the other hand, manpower supply, especially physician supply, is the key factor in the distribution of health facilities and the lack of specialized manpower leads to inefficiency of other physical, financial, and equipment resources [2]. Despite the great achievements attained by reforming the health system in countries, there are many inequalities in the distribution of resources in different countries. Inequitable distribution of health resources is also a global problem and is more clearly identified in developing countries [9]. When it comes to manpower, the issue of imbalance always stands out. Manpower imbalance is an unpleasant phenomenon that can be unbalanced in terms of quantity, quality, or distribution [10]. The world health system is increasingly facing the challenge of manpower shortages and inadequate distribution, but recent efforts to develop human resource policies in the health system have often focused on developing countries [8]. The World Health Organization reports that half of the world's population lives in rural areas, while less than a quarter of physicians work in these areas [11]. International evidence has shown that the unbalanced distribution of health system manpower is a serious problem. In most countries, a high proportion of health personnel works in rich cities [6]. According to a 2006 WHO report, the distribution of human resources in the health system is unequal between countries and within countries [12]. There is also a shortage of manpower and human resources compared to health needs. The report found that Canada and the United States, with 10% of the world's diseases, have about 37% of the health workforce, and African countries, with 24% of the world's disease, account for only 3% of the total health workforce. In Iran, many measures have been taken to improve health indicators, such as the development of health networks in cities and villages, the family doctor program in villages and low-income groups living in cities, the health transformation program, self-employed insurance for urban hospitalization, and the rural insurance program. But studies show that there is still a deep difference in the distribution of health services between different income groups in society [13]. The Ministry of Health, Treatment, and Medical Education, to distribute specialized manpower in Iran, has taken measures such as leveling the provision of health services, sending specialized personnel to deprived areas in the form of manpower and family physician program. However, since the mentioned methods are often in a state of domination and their implementation has not been effective, there are still problems related to the lack of access to specialized personnel in many areas [2]. Various studies conducted in Iran have shown that the distribution of general practitioners and specialists has not been done properly [3, 5, 6, 9, 14]. Various studies have also shown that there is a strong relationship between the distribution of human resources and the quality of service delivery, and the inadequacy of human resources leads to a decline in the quality of patient care. Also, one of the most important ways to increase the use of this valuable resource is to standardize the composition and distribution of human resources [15-17]. However, if the required number of physicians is provided within a geographical area, their unbalanced geographical distribution can lead to inadequate access to health care in areas with a shortage of physicians. Also, in areas where there is a surplus of physicians, this leads to over-provision of medical services and consequently increases medical errors and side effects [18]. Therefore, in addition to the importance of increasing resources in the health sector, the method of distribution among different regions should also be considered because simply increasing the resources of the health sector will not reduce inequality in the distribution and allocation of these resources [9]. Therefore, to increase the resources of the health sector and reduce inequality in the distribution and allocation of these resources among different regions of a country, the adoption of clear, scientific, and evidence-based policies seems necessary [19]. Given that in recent years, during the health system transformation program, more physicians have been distributed in less privileged areas, and given that human resources, especially physicians, are the most important resource for achieving universal health coverage, studies should be done to solve the distribution problem of this group.

On the other hand, the majority of the research community in such studies in the country were general practitioners and specialists working in centers affiliated with medical universities, and no study was found that examined the distribution of physicians in all organizations. Also, the study of the impact of the health transformation program on the distribution of human resources and determining the dimensions of this plan in this regard is of particular importance, which has been less addressed so far [20]. Significant studies have been conducted on the distribution of human resources in the field of health. The difference between this study and other studies is that, firstly, this study was conducted after the implementation of the Health Transformation Plan. Second, the present study included all general practitioners and specialists working in all cities covered by Ahwaz Jundishapur University of Medical Sciences, including public, private, armed forces, and organizations (and not just physicians dependent on the Ministry of Health). This study aimed to investigate justice in the distribution of general practitioners and specialists of Ahvaz University of Medical Sciences. For this purpose, in this study, the Gini coefficient index and Lorenz curve, which are the most common indicators to study the equality of the distribution of resources in the health sector, and similar to previous studies, were used in this study [3-5, 9, 14, 20-22]. In this way, by knowing the distribution of physicians, important and valuable findings can be provided for managers and provincial officials as well as trustees of the Ministry of Health to be a basis for establishing equity in the distribution of these human resources. The geographical distribution of physicians is a major challenge to achieving equity in access to health services and an important indicator of equality in the performance/evaluation of the efficiency of health systems [8]. Obviously, with this action, we can take a step towards achieving justice in physical, economic, local, and temporal access and benefiting from health services.

Materials and Methods

This descriptive cross-sectional and retrospective study was conducted in 2019 and was applied. The study population consisted of all general and specialist physicians who were engaged in medical work in 2018 in the affiliated cities of Ahvaz Jundishapur University of Medical Sciences (public, private, and non-governmental general practitioners). Ahwaz Jundishapur University of Medical Sciences covers 18 cities. The research sample was the same research community (all general practitioners and specialists working in Ahwaz Jundishapur University of Medical Sciences) and no sampling was done. Information about general practitioners and specialists was received through Khuzestan Province Medical System Organization, Departments of Treatment, Health and Management Development and Resources of Ahwaz Jundishapur University of Medical Sciences and Khuzestan Province Management and Planning Organization (Statistics Center).

To determine the validity of the data in this section, the statistics obtained from the above centers were compared with each other and also through a field survey of one of the cities (Ahvaz) with these statistics, verification was performed; finally, the data of the Management and Planning Organization of the province was the criterion for this study. Also, the population information of the above cities was extracted based on the population of 2017 and the estimate of 2018 of the Statistics Center of Iran as the most documented population statistics database in Iran. Data collection tools in this study were the use of documents in related organizations. This information was obtained after obtaining permission from the university and coordination with relevant organizations. In this study, to measure the equitable distribution of general practitioners and specialists, two indices of the Lorenz curve and Gini coefficient index and also relative to the population (per 1000 people) were used. Then Excel software was used to enter and analyze the data. Gini Coefficient: Geometrically is the ratio of the area between the Lorenz curve and the equality line to the total area below the equality line [21].

Statistically, it is the ratio of the inequality of the income distribution to the maximum inequality in a completely unfair distribution.

The value of the Gini coefficient varies between zero and one. In the case of perfect equality, it is zero and in the case of complete inequality, it is one [23]. When the Gini index value is less than 0.2, complete equality in distribution is observed. If the Gini index value is between 0.2 and 0.3, the equality in the distribution is largely observed, the value between 0.3 and 0.4 indicates the inequality in the distribution, and the values between 0.4 and 0.6 indicate high inequality in distribution. Values above 0.6 also indicate complete inequality [20]. There are different methods for calculating the Gini coefficient that in the present study, the formula presented by Brown has been used. In the Gini coefficient formula, xi is the cumulative percentage of the population Yi is the cumulative percentage of the mentioned resource variables and n is the number of social class divisions separately for the existing variables [24].

$$Gini = 1 - \sum_{i=1}^{n} (x_{i+1} + x_i)(y_{i+1} + y_i) \quad (1)$$

Lorenz Curve: Introduced by Max Lorenz in 1905 to show the distribution of income in a community. The square diameter represents the fair distribution of society's income. The greater the convexity of this curve, the more unjust the distribution of income and wealth of the society, and the fairer it goes to diagonal **(Figure 1)** [14].

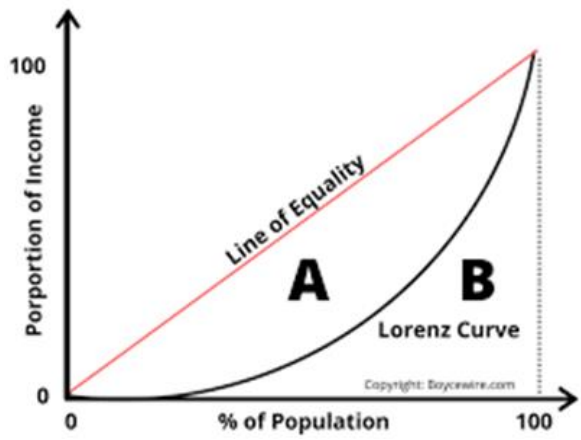

Figure 1. Lorenz Curve

The Lorenz curve is the geometric location of points whose coordinates are the cumulative percentages of population and income or expenditure (in this study, a general practitioner and a specialist). The Lorenz curve shows one dimension of the cumulative percentage of the population (X-axis) and the other dimension of the cumulative percentage of general practitioners and specialists (Y-axis). In this diagram, the 45-degree line is a sign of equity in distribution and any value of the curve deviating from this line means that the distribution is unfair [23].

Results and Discussion

In this section, using the indicators of the physician to population ratio (per 1000 people), Gini coefficient, and Lorenz curve, the status of equity in the distribution of general practitioners, specialists and the whole practitioners in the affiliated cities of Ahwaz Jundishapur University of Medical Sciences has been shown.

Table 1. The ratio of general practitioners and specialists to the population in the affiliated cities of Ahwaz Jundishapur University of Medical Sciences

No.	City	General practitioner ratio (per 1000 people)	Specialist physicians ratio (per 1000 people)	Total physician ratio (per 1000 people)	Percentage of the population	Percentage of general practitioners out of total general practitioners	Percentage of specialist physicians of all specialist physicians
1	Ahvaz	0.23	0.42	0.65	43.52	40.53	62.58
2	Bandar Mahshahr	0.11	0.19	0.30	9.9	4.8	6.46
3	Eizeh	0.26	0.14	0.40	6.62	7.06	3.34
4	Andimeshk	0.22	0.26	0.48	5.67	5.2	2.9
5	Ramhormoz	0.22	0.22	0.44	3.8	3.46	4.34
6	Masjed Soleiman	0.23	0.23	0.46	3.78	3.6	3
7	Dasht Azadegan	0.24	0.19	0.43	3.6	3.6	2.33
8	Karoun	0.42	0.75	1.17	3.53	6.13	9.02
9	Baghmalek	0.28	0.14	0.42	3.51	4	1.67
10	Bavi	0.26	0.04	0.3	3.22	3.46	0.45
11	Omidieh	0.23	0.19	0.42	3.08	2.93	2
12	Ramshir	0.42	0.12	0.54	1.8	1.8	0.78
13	Hamidieh	0.23	0.05	0.28	1.79	1.73	0.33
14	Andika	0.33	0	0.33	1.57	2.13	0
15	Hendijan	0.5	0.1	0.60	1.29	2.66	0.45
16	Hoveizeh	0.35	0	0.35	1.28	1.86	0
17	Lali	0.44	0.07	0.51	1.26	3.6	0.33
18	Haftgol	0.49	0	0.49	0.74	1.42	0
	Total	0.24	0.29	0.54	100	100	100

According to **Table 1**, in the general practitioner column, the total ratio of a general practitioner to population is 0.24. Also, none of the cities covered by the university has a ratio of one general practitioner per 1000 population, and none of the cities has a ratio of more than 0.5. This ratio is the city of Ahvaz as the capital of the province is 0.23, which is less than the total ratio. The cities of Hendijan (0.5), Haftgol (0.49), and Lali (0.44) have the highest ratio of a general practitioner to population and Bandar Mahshahr (0.11) have the lowest ratio of a general practitioner to population, respectively.

In the specialist practitioner section, the total ratio of specialist physicians to the population is 0.29. In addition, none of the cities covered by the university have the ratio of one specialist practitioner per 1000 population. Karun city has the highest ratio of a specialist to the population with 0.75; Ahvaz (0.42) is placed in the next rank after Karun. Except for Karun, 17 other cities have a ratio below 0.5. Andika, Haftkel, and Hoveyzeh are without specialists, and Bavi (0.04), Hamidiyeh (0.05), and Lali (0.07) have the lowest ratio of a specialist to population. Only in 2 cities, the ratio of specialist physicians to population is higher than the total ratio (0.29).

In general, the ratio of total physicians to the population in the cities covered by the university is 0.54. Furthermore, Karun (1/1), Ahvaz (0.65), Hendijan (0.61), Ramshir (0.54), and Lali (0.52) have the highest ratio of total physicians to population, respectively. Karun with a ratio of 1.1, is higher than the ratio of one in 1000 people, which indicates the inequity distribution of physicians compared to other cities. In addition, Hoveyzeh (0.35), Andika (0.33), Bandar Mahshahr (0.31), Bavi (0.30), and Hamidiyeh (0.29) have the lowest ratios, respectively.

It should be noted that the cities of Bavi, Hamidiyeh, and Karun are very close to the university and geographically are close to each other and have different values in the ratio of total physicians to population. Moreover, only 3 cities are higher than the total ratio of general practitioners and specialists to the population in the cities covered by the university.

According to the findings, about 44% of the population is located in Ahvaz city and 56% of the population lives in 17 other cities. Furthermore, 66% of the population is placed in 4 cities and 34% of the population is placed in 14 other cities **(Table 2)**.

Table 2. Distribution of Physicians based on Gini Coefficient in the Cities Affiliated to Ahvaz Jundishapur University of Medical Sciences

	Gini Coefficient	Distribution Status
General Practitioner	0.16	Full equality
Specialist Practitioner	0.31	Inequality
All the Practitioners	0.19	Full equality

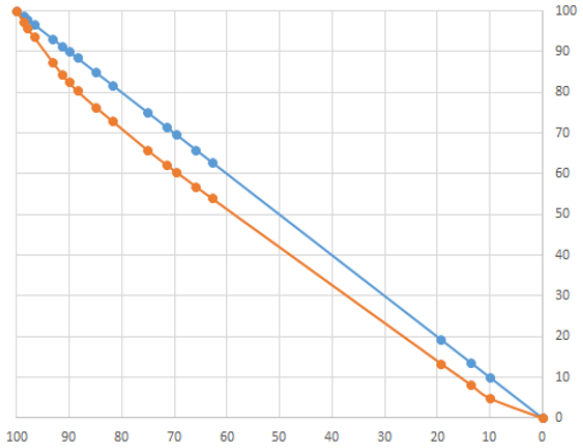

Figure 2. Lorenz Curve of General Physician Distribution in the Cities Affiliated to Ahvaz Jundishapur University of Medical Sciences

According to **Figure 2**, the general practitioner distribution curve has a short distance from the line of justice (equity) or equality, which is obtained according to the Gini coefficient and interpretation of the Lorenz curve indicates complete equality in the general practitioner distribution.

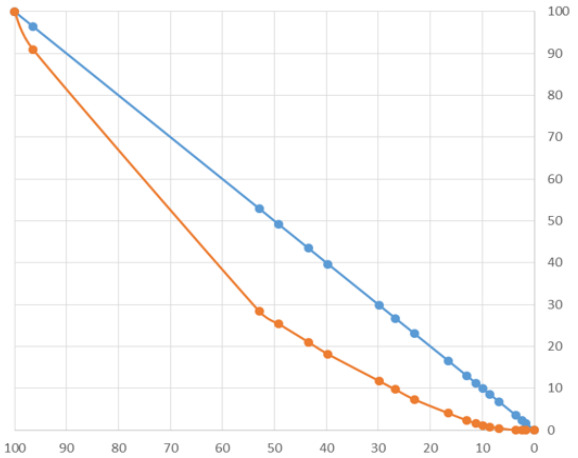

Figure 3. Lorenz Curve of Specialist Physician Distribution in the Cities Affiliated to Ahvaz Jundishapur University of Medical Sciences

According to **Figure 3**, the distribution curve of the specialist practitioners is relatively far from the line of justice or equality, which is obtained according to the Gini coefficient and interpretation of the Lorenz curve indicates the unequal distribution in the specialist doctor section. The distance between the curve of the specialist practitioner and the line of justice or equality is greater than the curve of the general practitioner which was predictable from the Gini coefficient obtained for the specialist physician. This distance further indicates that the distribution of the employed general practitioner is fairer than the distribution of the employed specialist.

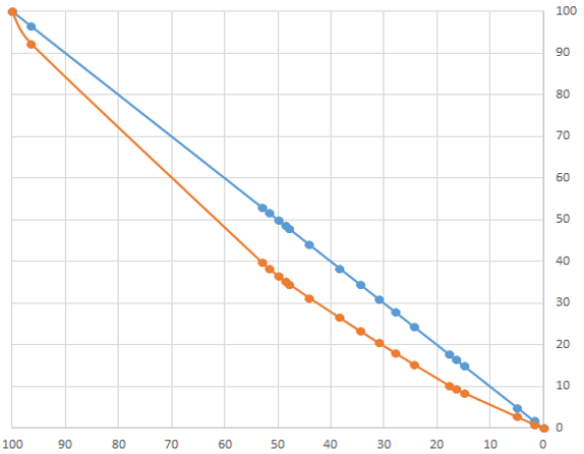

Figure 4. Lorenz Curve of Total Physician Distribution in the Cities Affiliated to Ahvaz Jundishapur University of Medical Sciences

According to **Figure 4**, the total distribution curve of physicians in the study population is far from the line of justice or equality, which is obtained according to the Gini coefficient and interpretation of the Lorenz curve indicates complete equality in the distribution of total physicians.

Considering the importance of providing specialized manpower inequitable distribution of health facilities and the impact of equitable distribution of human resources in the field of population health and optimal and efficient use of other resources in the health system, this study aims to determine justice and equity in the distribution of general practitioners and specialists at Ahvaz Jundishapur University of Medical Sciences. In this study, the fair distribution of physicians was investigated using the Gini coefficient index, Lorenz curve, and ratios.

According to the findings of this study, the population in the cities affiliated with Ahvaz Jundishapur University of Medical Sciences has an unbalanced distribution. Furthermore, the ratio of general practitioners, specialists, and total physicians to the population in the study population is 0.24, 0.29, and 0.54, respectively. Also, none of the studied cities has the ratio of one general practitioner and specialist per 1000 population. In the part related to the ratio of total physicians to population, only Karun with a ratio of 1.17 is higher than the ratio of one in 1000 people, which in comparison with other cities indicates the disproportionate distribution of physicians.

The study of Bayat *et al*. (2020) showed that the ratio of specialist physicians to the population in the whole country is 4.9 people per 10,000 people and the lowest and highest proportions in the country are in Sistan and Baluchestan provinces (1.5 in 10,000 people) and Tehran (9.2 people per 10,000 people). Furthermore, this ratio was 2.8 per 10,000 people for Khuzestan province [7]. In the present study, the ratio of specialized physicians to the population in the study

population (based on 10,000 people) was 2.9 and was lower than the ratio of the country in comparison with the study of Bayat *et al*. The ratio of specialist physicians to the population in the present study confirmed the research of Bayat *et al*. In addition, in the study of Nourihekmat *et al*. (2018), the ratio of specialized physicians to the population (per 100,000 people) in Ahvaz Jundishapur University of Medical Sciences was 31 [6]. In the present study, the ratio of specialist physicians to the population (based on 100,000) was 29. It seems that this small difference in the ratio of specialists to the population between the present study and the study of Bayat *et al*. [7] and Nourihekmat *et al*. [6] may be due to the year of study, changes in population, and several physicians. In the study of Haghdoost *et al*. (2010), the highest ratio of general practitioners per thousand populations was in Tehran (1.87), Yazd (1.39) and Isfahan (1.22), and the lowest ratio was in North Khorasan (0.34), Sistan and Baluchestan (0.37) and South Khorasan (0.38). Also, the highest ratio of specialist physicians per thousand populations was in Tehran (1.11), Semnan (0.46), and Isfahan (0.44) provinces, respectively, and the lowest ratio was in South Khorasan (0.06), Sistan and Baluchestan (0.1) and Hormozgan (0.12) [25]. In the study of Mossadeghrad *et al*., Although the ratio of specialized physicians to the population in the provinces of the country is different, their distribution in the country has been fair. Policymakers and managers of the health sector, in addition to the distributional justice in the distribution of specialist physicians, should also pay special attention to the needs of society in the distribution of medical professionals [14]. In the study of Mossadegh *et al*., although the ratio of specialized physicians to the population in the provinces of the country is different, their distribution in the country has been fair. Policymakers and managers of the health sector, in addition to the distributional equity in the distribution of specialist physicians, should also pay special attention to the needs of society in the distribution of medical professionals [14]. In the study of Honarmand *et al*., the general practitioner was not distributed among the cities of the province according to the population and health needs; To achieve the goal of full equality, especially based on health needs, more efforts should be made by the authorities [26].

The present study confirmed the research of Mossadeghrad *et al*., Honarmand *et al*., and Bayat *et al*. In addition, the ratio of total physicians to population in the study population is less than the ratio of physicians to population in the country that situation seems to be due to factors such as specific climatic conditions and lack of welfare facilities in the study community. According to the findings, the cities where the university or the faculty of medical sciences is located, as well as the cities with industrial economic, and developed status have better ratios, so that the ratio of the specialist to population is higher than the ratio of a general practitioner to population. To improve the physician to population ratio in the study population, through the development of welfare facilities, we can see an increase in the presence of physicians.

The Gini coefficient of distribution of general practitioners, specialists, and total practitioners in studying the population was calculated to be 0.16, 0.31, and 0.19, respectively; the distribution was completely equal in the general physicians and total physicians, and inequality was seen in the specialist physician. The Lorenz curve also confirmed these coefficients. The study of Feyzabadi *et al*. (2018) showed that the Gini coefficient of the distribution of general practitioners and specialists in Iran has decreased from 2006 to 2015. The Gini coefficient for general and specialist physicians in 2015 was 0.27 and 0.42, respectively [9]. In addition, in a study entitled The Geographical Distribution of Primary Care Physicians in Japan and the United Kingdom, the numerical value of the Gini coefficient was 0.17 in Japan and 0.08 in the United Kingdom [27]. Another study in Albania and Greece showed that the Gini coefficient for general practitioners in Albania was 0.48 and in Greece was 0.18 [28]. Yardım and Uner in their study entitled Geographical Inequality in the Distribution of Physicians in Turkish Provinces showed that the Gini coefficient for physicians in 2010 was 0.14 [29]. The study of Zandian *et al*. in the cities of Ardabil province showed that the Gini coefficient of general practitioners and specialists in 2009 was 0.44 and 0.52, respectively. They concluded that the distribution of specialist physicians has more inequality than general practitioners [30]. Goodarzi *et al*. (2015) obtained the Gini coefficient of distribution of general practitioners in the provinces of the country in 2006 and 2011 as 0.146 and 0.138, respectively [31]. Also, in the study of Mossadegh Rad *et al*. (2017), the Gini coefficient of the distribution of specialist physicians in the provinces of the country in 2011 was equal to 0.043 [14]. Hara *et al*. (2017), in a longitudinal study using the number of physicians in 100,000 people in the medical district 2 (in Japan, medical services are geographically divided into three districts) and conducted between 2000 and 2014, found an increase in the total number of physicians in Japan. However, in recent years, the demand for physicians has decreased in all areas except urban areas with lower physician supply. In addition, justice for the distribution of physicians has been steadily deteriorating since 2000. The results show that the lack of demand for health care will lead to misleading results, and major reforms in the Japanese health care system are needed to improve the distribution of physicians [32]. According to the mentioned studies, the Gini coefficient of general practitioner distribution in the present study was lower than Albania [28], Ardabil province [30], and Greece [28], but compared to a similar study in Turkey [29] and other provinces of the country [31] was more. Also, the Gini coefficient of the distribution of specialist physicians in the province was lower than the distribution of specialist physicians in Ardabil province [30] and was higher than the Gini coefficient of the distribution of specialist physicians in the provinces of the country [14, 31].

The Gini coefficient of distribution of general practitioners and specialists in this study was lower than the coefficients obtained in the study of Feyzabadi *et al*. [9]. In general, according to the Gini index, the distribution of general

practitioners was completely equal and that of specialist physicians was unequal. It seems that the reasons for the fair distribution of general practitioners in the cities affiliated to Ahvaz Jundishapur University of Medical Sciences are the implementation of the Health Transformation Plan (physician retention package), encouragement and residency of physicians, and the existence of a mandatory physician plan. Furthermore, the causes of the physician shortage and unequal distribution of specialist physicians in the study population include the unbalanced distribution of population and welfare services and deprivation of most of the cities. In such a way that crowded, advanced, industrial cities with appropriate economic levels have enjoyed the benefits of facilities and services and have a large number of physicians. Also, financial incentives, non-native physicians, social and economic conditions of the community, lack of adequate recreational and educational infrastructure, and hot weather are important reasons for the lack of general practitioners and unfair distribution of specialist physicians in the community. Moreover, the impact of factors such as health status and disease burden on the distribution of physicians and their ratio to the population in each city should not be ignored.

One of the limitations of this study is the difficulty of collecting information on the number of general practitioners and specialists working in health centers due to the lack of an integrated and coordinated system in the country's health care system. For this reason, information was obtained from several related organizations over a long period. Another limitation is that the Gini coefficient index is not summable, in other words, the Gini coefficient of the whole society is not equal to the sum of the subgroups of the society. This index gives the richest and poorest households the same weight and is sensitive to changes in income, regardless of whether these changes occurred among rich, middle, or poor households.

According to the results of this study, the fair distribution of specialist physicians, increasing the number of general practitioners and specialists, and improving the physician to population ratio in the study population seems necessary. At the same time, the importance of providing a physician to other human factors is a key factor due to the nature of the activities of health care organizations. In this regard, by improving economic conditions, eliminating deprivation, and creating suitable conditions for the employment of physicians in the affiliated cities, an effective step can be taken towards the equitable distribution of physicians, especially specialist physicians, and increasing the ratio of physicians to the population. Indigenization policy and sustainable commitment to the survival of medical graduates can also be effective in improving these ratios.

It is also suggested that to distribute the specialist physician staff fairly and increase the number of physicians, deprived cities should be given priority and health, treatment, and welfare facilities and services should be distributed fairly among the population. Also, the importance of leveling health services with an emphasis on fair and need-based access should be considered. In this study, the distribution of general practitioners and specialists based on the population has been investigated, so it is recommended to use the need indicators (mortality, disease, etc.). Also, the Gini coefficient alone cannot show all aspects of equity in distribution, so in other studies, the concentration index, index of dissimilarity, and Gaswirth index can be used.

Conclusion

Although the ratio of general practitioners and specialists to the population in the cities affiliated to Ahvaz University of Medical Sciences is low, the distribution of general practitioners and total practitioners is has been fair and specialist physicians have been unfair. Policymakers and managers of the university health department should pay special attention to increasing the ratio of general practitioners and specialists to the population and fair distribution of specialist physicians in the cities affiliated to Ahvaz Jundishapur University of Medical Sciences.

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