

ORIGINAL RESEARCH

Factors influencing the geographic distribution of physicians in Iran: a qualitative study

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ABSTRACT

Introduction: The uneven geographic distribution of physicians has been a longstanding important issue worldwide. Different policies have been recently employed in Iran, with the aim of bridging the gap. This study aimed to explore factors influencing the distribution of specialist physicians in Iran and investigate the effects of newly established policies on attracting and retaining physicians in rural and remote areas.

Methods: This qualitative study was conducted in 2012. Qualitative data were obtained through an open-ended questionnaire and by reviewing relevant documents. Participants were 82 key officials from medical universities, who were directly involved in the distribution of physicians across the country, including vice chancellors for treatment affairs, managers for treatment affairs, and human resources experts. Thematic analysis was used to analyse qualitative data.

Results: Four main factors influencing the distribution of physicians were explored, namely external, contextual, individual, and organizational factors. The decision to practice in rural areas was mainly influenced by socioeconomic characteristics of the designated areas and personal attributes of physicians, including sex, income expectations, and rural background. Participants also asserted that the implemented policies had a major positive influence on the distribution of physicians. In addition, participants believed that the improvement in the distribution of physicians had both positive economic and health impacts in underdeveloped areas.

Conclusions: It seems that the regional distribution and supply of physicians have been improved in the light of the implemented policies in recent years. The study also revealed that a number of factors influence physician choices to stay and practice in rural and



underdeveloped areas. Policies such as providing more financial and non-financial incentives, reducing disparities between physicians' income in rural and metropolitan areas, selection of students with rural background, and supportive measures for physicians working in underserved areas were recommended.

Key words: compulsory service, Iran, medical workforce, physician, underdeveloped rural area.

Introduction

Ensuring equitable access to health care for all has been recognized as a top priority among policy-makers worldwide¹. Uneven distribution of the health workforce is a global phenomenon posing a tremendous challenge to equitable healthcare delivery^{2,3}. The mal-distribution of physicians is of particular importance due to their fundamental role in providing health care^{4,5}. Distribution of physicians in rural communities is an important political issue both in developed and developing countries⁴⁻⁷. Iran is not an exception; its geographical vastness especially has led to the aggregation of physicians in urban areas and their shortage in rural areas and small cities. Shortages of physicians in rural areas is a major concern because in many societies rural populations tend to have more health needs and less access to quality healthcare services and qualified healthcare providers than urban populations do⁸.

Multiple factors can contribute to the shortage of physicians in rural and remote areas, including physicians' preferences to work in urban areas, inadequate supply of medical graduates, and difficulties in recruiting and retaining physicians in rural and remote areas⁹. Physician preferences relate to factors such as sex, marital status, physician background, and community demographics¹⁰. Further, it has been argued that physicians tend to select larger cities to practise because of the greater demand for health services and higher revenues¹¹.

Given the multiplicity of factors influencing attraction and retention of physicians in rural and remote areas, a bundle of interventions is needed to redress the inequitable distribution

of physicians^{2,12}. Strategies such as financial support, offering professional development opportunities, recruiting candidates from rural areas, and improving living and working conditions have been reported as successful in addressing geographic mal-distribution of physicians¹².

Overview of health system and distribution of physicians in Iran

The healthcare system in Iran has gone through major reforms over the past three decades. Primary Healthcare System (PHC) was established in 1978, and has led to remarkable health indicator improvement over the past years^{13,14}. In 1985, the integration of the two systems of healthcare delivery and medical education led to the establishment of the Ministry of Health and Medical Education (MOHME). One of the main responsibilities of MOHME is to train the *required* human resources for the health system¹⁵.

To improve the supply of the health workforce, especially physicians, the number of medical universities has risen significantly during recent years by a total number of 40 in 2013, of which ten have been established in the underdeveloped areas of the country. One of the initial aims of these local medical universities is to train local workforces for the underdeveloped areas of the country. The medical universities operate under the supervision of MOHME and they are responsible for providing public health services through a nationwide network at three primary, secondary and tertiary care levels. In addition, the performance of all healthcare organizations, both public and private, is evaluated by MOHME.



Evidence suggests that the distribution of physicians has been improved in the country considerably in the past few years. However, the problem of uneven geographic distribution of physicians has not been completely resolved. There is still an unequal physician to population ratio between large cities and rural and remote areas. This means access to health care in underdeveloped areas and rural communities, where the health indicators are lower than the national average, remains a serious problem^{16,17}.

To improve the geographic distribution of physicians, a policy package was developed about 10 years ago by MOHME, including financial incentives, non-financial incentives, and obligatory community service. This program requires specialist physicians to work for MOHME for a specified time period as compulsory community service after their graduation. Upon the completion of compulsory community service, they are issued a license authorizing them to practise in the public and/or private sectors. Moreover, MOHME has specified some remote and underserved areas as Special Underserved Areas (SUAs). Physicians who volunteer to practise in SUAs will serve a shorter period of community service than those working in other areas (two-thirds of the required period). Besides the prioritization of some underdeveloped areas, a number of supportive measures such as housing and financial incentives (referred to as fixed payments) have been developed to encourage physicians to work in remote areas.

MOHME assigns physicians across the country on the basis of several certain factors, including the need for specialized care in different areas, physicians' choices, and their individual and educational characteristics (marital status and the score obtained in specialty certification examination). To consider health needs in the distribution of physicians, medical universities declare the needs for specialized healthcare services in their catchment area periodically to MOHME. Facilitating the assignment process, a web-based database has been designed which encompasses all the information regarding the health workforce around the country; this is routinely updated by human resources experts in each medical university. Every graduated specialist should provide

their information using the online MOHME database and is also informed about their assigned working place via the database in a few months. In order to respond to the petitions of physicians who are dissatisfied with their assigned working place, MOHME has developed a special committee to review such petitions. According to the data collected over the past three years, on average, about 20% of the petitions resulted in swapping of physicians' designated working places¹⁸. It should be noted that a physicians; relocation is assigned by the committee on the basis of need.

Furthermore, evidence shows an improvement in the access to specialized health care in terms of the number of specialists in rural areas from 2006 to 2012. Over the last seven years, specialized healthcare services have been provided in 642 undeserved areas that have been deprived of such services.

To shed further light on physician distribution issues in Iran, this qualitative study was undertaken. The study aimed to identify factors affecting the distribution of physicians across the country and determine the effects of recent health workforce policies on attracting and retaining physicians in rural and remote areas from the perspective of key relevant officials who were directly involved in the distribution of physicians.

Methods

To meet the objective of the study, a qualitative design was employed. Data were collected through an open-ended questionnaire, containing a total of 16 questions, from June to September 2012. The questionnaire was developed on the basis of a preliminary review of literature on physician distribution and reviewing relevant national and local documents and reports. The questionnaire was piloted in consultation with human resources experts at MOHME and revised accordingly.

At the study time, all 40 medical universities in the country, which are responsible for providing health care and medical education in their catchment areas, were included in the



study. In each university, the three most relevant key officials working in treatment were recruited, including vice chancellors for treatment affairs (the senior managers for treatment affairs), managers for treatment affairs, and human resources experts. These people were directly involved in the distribution of physicians at both policy-making and implementation levels across the country.

The participants were informed of the purpose of the study, the voluntary character of participation and the anonymity of the collected data. Pursuant to agreeing to participate in the study, each participant received the questionnaire along with an informed consent form and a self-addressed envelope. The participants were asked to fill in the questionnaire within 2 weeks. Non-respondents were followed up on two occasions via email or phone. Furthermore, inadequate or ambiguous responses were clarified either in person or through telephone interviews. Finally, a total of 82 out of 120 responses were received (response rate=69%), including 27 (68%) vice chancellors for treatment affairs, 24 managers for treatment affairs (60%) and 31 human resources experts (78%). All participants were male except eight human resources experts. The mean age of the study's participants was 40 years and their average organizational tenure was 5 years.

The thematic analysis method was used to analyse the qualitative data. Following data review and immersion in the data by the researchers (ie extensive reading and re-reading of the transcripts), all data were analysed at a detailed level, using descriptive, open coding by one of the researchers (second author). These codes were then grouped to form themes manually. Credibility of the data analysis was confirmed by peer check and member check strategies. For peer checking, coding and themes were reviewed by all members of the research team and disagreements were resolved through further discussions. In member checking, a number of participants were asked to check the emerged themes to ensure whether the findings were congruent with their perceptions and opinions.

Ethics approval

This study received ethics approval from the Ethics Committee of Iran University of Medical Sciences, ethics approval number 92-04-136-24339.

Results

Three key themes and eight subthemes were explored with regards to factors influencing the distribution of physicians and outcomes of related implemented policies as follows.

Factors influencing geographic distribution of physicians

Four main factors influencing the distribution of physicians were explored: individual, contextual, organizational and external factors.

Individual factors: According to the participants, factors related to specialists such as socioeconomic background, marital status, gender, values, preferences, and religious beliefs could affect the distribution of physicians. About 40% of the participants asserted that some physicians were dissatisfied with their assigned locations because they believed that their preferences had the least effect on their placement. Considering the fact that performing the compulsory community service is a prerequisite to gain a license to work in public or private sectors for physicians in Iran, some participants believed that physicians were willing to fulfill the community service as quickly as possible so they could start their own practice. An expert from an underserved area asserted:

The majority of physicians don't have, and have never had, a positive attitude towards working in remote areas, but considering factors such as the concentration of physicians in affluent areas and the coercive nature of the community service, a shift is taking place in their attitudes. Now they regard the obligatory service as an opportunity to develop their professional careers.



Besides, 50% of the participants asserted that female physicians were less willing to work in underdeveloped areas due to their family commitments. One of the vice chancellors stated: 'A number of physicians, especially female physicians, would not start the mandatory service if they were assigned to a remote region.'

Furthermore, about 75% of the participants expressed physicians' income expectations as a major factor affecting their preferences. In addition, 40% of the participants argued that some physicians already working in hospitals did not welcome the assigned physicians because it could jeopardize their own income.

Moreover, 30% of the participants believed that income was not the only factor influencing physicians' choices. They asserted that in regions with few specialists, most physicians were not willing to work due to work overload and heavier responsibilities.

About 50% of the participants considered the social background of the physicians as another important factor influencing the specialists' intentions and decisions to practise in rural and underdeveloped settings. They believed that physicians with rural backgrounds were more likely to choose to practise in rural areas. Therefore, they suggested that a number of medical students should be selected from among those who originally come from rural communities. Some participants suggested that more incentives for physicians who choose to serve in underserved areas should be provided, such as offering them permanent employment and facilitating their admission to clinical fellowship programs.

Contextual factors: About 90% of the participants believed that contextual factors such as population size, extent of medical demand, and socioeconomic characteristics of the area played a major role in attracting physicians.

Almost 90% of the participants indicated low income and lifestyle-related issues as the main reasons for physicians' reluctance to practise in rural areas. More than 95% of the respondents mentioned lack of economic incentives and

income disparities between underserved areas and large cities as major factors influencing physicians' decisions to stay and practise in rural and underserved areas. They believed that the differences between private and public sector payments encouraged physicians to move to other areas where they could raise their income through working in the private sector. One of the human experts from an underserved area said: 'The difference in income between large cities and rural areas is so significant that even people with rural background have no desire to practise in such areas.'

Participants, particularly top managers, believed that the main solution for reducing the disparity in physicians' income between large cities and rural areas would be revising the payment policies and developing a better local tariff for physicians working in underdeveloped areas. Other important community-related factors expressed by the participants included poor-quality schools for physicians' children, inadequate accommodation facilities, and lack of recreational services in remote and rural areas.

Organizational factors: More than 50% of the participants indicated that medical universities played a crucial role in the distribution of physicians. Based on the newly designed workforce distribution policy, medical universities should reliably assess the health needs of the population in their catchment areas and consequently set their priorities in terms of the numbers of the health workforce, including specialist physicians. Each medical university should declare its needs for physicians to MOHME. In fact, medical universities could compete in recruiting more physicians. However, some participants stated that some medical universities overestimated their needs, which could result in some problems in the distribution of the health workforce across the country.

About 40% of the participants believed that the medical universities' boards of trustees often exerted influence in the distribution of physicians. This could be based on their own preferences or the pressure coming from local external stakeholders. In addition, participants referred to a time lag between the end of a physician's community service and the



beginning of their temporary or permanent substitute's work, which might negatively affect the continuity of care. They believed that such inadequacies could be alleviated through proper planning by medical universities.

External factors: About 80% of the participants believed that the distribution of specialist physicians was influenced by some individuals who were not directly involved. Most of these people were local authorities within the provinces who aimed to improve access to health care in their own areas, disregarding the real needs of other areas. For instance, one of the human resources experts in an underserved area asserted: 'Within the provinces, any people with political or organizational power tend to influence the distribution of physicians based on their own interests.'

About 20% of the participants, particularly vice chancellors, stated that sometimes exerting political pressure in the distribution of physicians was contrary to equitable distribution of the health workforce. Hence, they believed that such pressures, political in nature, would be extremely difficult to overcome.

Impacts of newly developed policies on the distribution of physicians

As noted earlier, in recent years, a wide array of policies and programs has been implemented to address the mal-distribution of specialist physicians in the country. Providing incentives such as financial compensations for physicians who volunteer to serve in underdeveloped areas and designating certain remote areas as SUAs are among the main strategies.

Impacts of fixed payments: Almost 90% of the participants, especially human resources experts, believed that such payments had a positive impact on physician satisfaction and retention. Furthermore, about 40% of the participants believed that since the amount of fixed payments was determined by each university, it was used as a supervisory mechanism by medical universities. Despite the positive impact of the fixed payments, 50% of the participants referred to delayed payments as one of the major shortcomings of the program that led to physicians'

dissatisfaction. As well, a number of health managers and experts (40% of the participants) emphasized that adequate budget should be allocated to each medical university at the beginning of every fiscal year. They believed that regular payments have a positive impact on physicians' retention in underdeveloped areas.

Impacts of designating some areas as Special Underserved Areas: About 90% of the participants believed that designating a number of underserved areas as SUA by MOHME has improved the access to healthcare services in such areas. A manager from one of these underserved areas said:

It seems that MOHME, with the cooperation of medical universities, has brought specialized healthcare services to underserved areas, where there was a serious shortage of primary health care.

Since the duration of mandatory community service by physicians in SAUs was shorter than in other areas, such areas were mostly selected by physicians who intended to continue their studies in subspecialty programs or emigrate to foreign countries. This issue was viewed by some participants, mainly managers and human experts, as the negative aspect of the SAUs program. One of the human resources experts asserted:

Those specialists, who are just looking to finish their community service period as quickly as possible, register in the SAU program. Because of the high turnover of physicians, we have received some grievances from the patients in these areas.

In addition to the aforementioned policies, some other interventions were implemented to improve the geographic distribution of physicians. Almost 80% of the participants referred to the development of the web-based database as a positive change that led to an effective and fair assignment process. Given that the whole process of physicians' assigning was done through the web-based database, the possibility for the manipulation of the results would be eliminated. Most of the participants believed that the intervention has significantly



increased the clarity and transparency of the assignment process.

A number of managers and human resources experts (40% of the participants) believed that the involvement of the medical universities in the health needs assessments and assignment process were among factors that helped balance the geographic distribution of physicians across the country. Further, 30% of the participants referred to certain challenges that medical universities faced in the distribution of physicians, such as the refusal of physicians to work in their assigned posts and the lack of a legally enforceable mechanism to make physicians start their practice at the given time. Physician shortage in some specialties was another issue brought up by a number of participants. In this regard, one of the managers asserted:

Now, the situation is better than before. The distribution of health workforce isn't based on local pressure or unrealistic needs anymore; but still in some underdeveloped areas, there is a shortage of physicians in certain disciplines and specialties.

Implications of improvement in geographic distribution of physicians

Almost 85% of the participants acknowledged that over the past 5 years, the geographic distribution of physicians and consequently the access to health care in underdeveloped and remote areas have been significantly improved. From the participants' perspective, the implemented policies had two major outcomes: improvement in health indicators and economic impact.

Improvement in health indicators: About 90% of the participants asserted that the rather equitable distribution of physicians has led to an improvement in health indicators. They reiterated that, thanks to physicians' availability, access indicators such as travel time for care, waiting time, and average number of physician visits have been improved in rural and remote areas. They argued that providing timely

specialized healthcare services in underserved areas has led to the improvement of patient satisfaction as well.

According to the participants, general measures of population health such as infant mortality rate (IMR) and mother mortality rate (MMR) have improved in underdeveloped areas due to presence of specialists. In addition, 642 regions in the country have received specialized healthcare services in certain specialties for the first time since 2005; about 10% of the participants mentioned this as a remarkable outcome of the implemented policies.

Economic impacts: About 50% of the participants mentioned that there was a considerable increase in the income of hospitals and health centers in underdeveloped regions because of the services provided by specialist physicians in such areas. A human resources expert from one of the underdeveloped areas stated: 'The presence of specialist physicians serving in remote areas has led to a significant rise in the healthcare centers' income.'

Discussion

The shortage and uneven distribution of the health workforce cause problems for people living in rural and remote areas in accessing to health care. Numerous interventions to address the inequitable distribution of healthcare professionals in rural and remote areas have been designed and implemented around the world¹². There is increasing evidence that a set of policies is needed to address uneven distribution of physicians⁶. To improve the geographic distribution of specialist physicians across the country, a policy package has recently been designed and implemented by MOHME in Iran. The majority of the participants in the study believed that there has been a significant improvement in the geographic distribution of specialist physicians in recent years. However, some problems were identified regarding the implemented interventions that need to be addressed in the future. Participants identified the implemented policies, especially compulsory community service, as the main reasons for increasing equity of access to healthcare services



in underserved areas. Numerous studies have reported the community service of physicians as the major contributing factor to increased access to healthcare services, reduced waiting times, and better staffing level in rural areas in other countries^{19,20}.

The findings of the current study revealed that physicians' decisions to stay in rural and underdeveloped communities is a complex issue influenced by a number of factors. Certain characteristics of physicians play a major role in their choices of practice location²¹. Similar to the findings of previous studies, the results of the current study indicate that physicians of rural origin were more willing to stay and practise in these locations than those with urban backgrounds²²⁻²⁵. As noted earlier, to ameliorate the maldistribution of the health workforce in Iran, the number of medical universities in underdeveloped areas has significantly risen over the past years. Establishment of the local universities has been reported as a major factor balancing health workforce distribution in other countries²⁶. It seems that increasing the number of medical students with rural backgrounds into local medical universities along with providing incentives to encourage them to work in rural areas after graduation may be some possible strategies to alleviate the problem of uneven distribution of physicians in Iran.

Moreover, in accordance with the findings of previous studies²⁷⁻²⁹, female physicians were less likely to work in remote areas. It seems that the work choices of female physicians are mainly influenced by their family commitments and responsibilities. Considering the fact that the number of female physicians has increased dramatically during recent years in Iran, MOHME may consider support interventions such as providing more flexible choices for female physicians to perform the compulsory service.

Another important factor influencing the geographic distribution of physicians was the socioeconomic characteristics of the designated area. These findings are consistent with those of previous studies, which concluded that physicians consider lifestyle factors such as adequate accommodation facilities, recreational infrastructure, and

access to good schools for their children when choosing their work locations^{30,31}. In order to improve healthcare delivery to rural areas, supportive measures such as improving transport systems and providing recreational and educational facilities should be considered as well.

Numerous studies have supported the value of interventions in achieving a more equitable distribution of healthcare professionals in rural and remote areas¹³. There is little consensus in the literature as to whether financial incentive-based policies could alleviate the health workforce shortage in rural communities in the long run^{6,10,32}. However, several studies have shown that direct financial incentives had substantial positive influence on the geographic distribution of health professionals in the short run^{29,33}. Likewise, the participants in the current study considered financial compensations and high salaries as a significant factor influencing physicians' choice of practice location. Apparently, the physicians' income gap between rural areas and large cities had an impressively negative impact on physician retention in rural areas. Another employed intervention to encourage physicians to work in underserved areas is prioritizing a number of such areas as SUA. The findings of the current study imply that the SUAs program has been successful in providing specialist physicians to these areas. However, the dissatisfaction of the rural communities with physicians' services calls for more attention from policymakers in selection of physicians who enrol in the program.

Compulsory public service has been subjected to a range of criticisms as an unfair measure^{3,34-36}. However, evidence shows that it enables governments to direct health services to less desirable areas and communities that are not well served³⁶. Financial and non-financial incentives have been recognized as possible mechanisms that could encourage physicians to practise in underdeveloped areas and make obligatory community service more attractive for them^{6,29,37}. It seems that the compulsory community service of physicians in Iran has increased the supply of qualified workers to underserved areas, where the access to primary healthcare services is inadequate. However, given the shortcomings of the program, it may not be a permanent solution for uneven



geographic distribution of physicians in Iran. Increasing the supply of physicians, selecting medical students from underdeveloped areas, as well as providing more incentives and supportive measures for physicians working in underserved area may increase the effectiveness of the community service program in the long run and guarantee the development of a permanent workforce for the underserved communities in Iran.

Limitations

The current study has identified several factors that could influence physicians' decisions to practise in rural areas. However, there is a need to conduct more rigorous quantitative studies to evaluate the short-term and long-term impacts of both coercive and supportive measures. In addition, the current study only covered the perspectives of officials who were involved in the distribution of physicians and did not explore the physicians' perceptions towards the implemented policies.

Conclusions

The current study provides useful insights for policy-makers who are faced with health workforce shortages in rural and underdeveloped areas. It seems that the regional distribution and supply of physicians have been improved in the light of the implemented policies in recent years. The study revealed that a number of factors influence physicians' choices to stay and practise in rural and underdeveloped areas. Further, policy-makers should consider the conditions for physicians' practising in underdeveloped areas and design more evidenced-based interventions to attract and retain physicians to such areas.

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