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Influencing Factors on Physicians' Retention in Training Hospitals of Qazvin University of Medical Sciences in 2017-2018

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ABSTRACT

Background: The uneven distribution of human resources in the health sector, especially in the medical profession, is a global phenomenon that poses a significant challenge to the population's access to quality health services. The aim of this study was to investigate the influencing factors on the retention of specialists and subspecialists working in training hospitals of Qazvin University of Medical Sciences in order to provide appropriate suggestions and practical solutions to increase their chances of survival in these areas.

Methods: This research is a descriptive-analytical study using conjoint analysis technique conducted between 2017 and 2018 among physicians. The study was conducted among 109 physicians who met the inclusion criteria of the study. DCE questionnaire was used to collect the research data. The collected data were entered into STATA software version 13 for statistical analysis and were statistically analyzed by Probit and Logistic regression models.

Results: The results show that the probability of physicians' retention in the city of work is 1.2 times higher if they were allowed to work in the private sector (β = 1.2). Providing proximity to the family also doubles the chances of physicians' retention (β = 2.2). Provision of adequate educational facilities (β = 1.07), moderate clinical facilities (β = 1.18) and favorable accommodations (β = 1.12) also increase the likelihood of physicians' retention in the workplace.

Conclusion: Considering all factors identified as the preferences of physicians due to the limitations of resources and the existing legal requirements cannot be applied in planning and policy making in the field of health care. However, being aware of these factors and then considering legal considerations that are considered mandatory by the Ministry of Health and Medical Education can greatly help in making effective policies in the area of physician retention.

Key words: Retention, Physician, Preferences, Conjoint analysis, Workplace

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Introduction

The unequal distribution of human resources in the health sector, especially in the medical profession is a worldwide phenomenon (1). This is considered as an important challenge with respect to the availability of high-quality health services to the public (2). This inequality not only causes undesirable health burdens in society, but also endangers health equity. Whereas access to the health care is among the most principle rights of all people in a society and has been stipulated in the Article 29 of the Constitution of the Islamic Republic of Iran. The physicians are the most important components of human resources in the health sector that provide specialized and sub-specialized services to patients (3). Studies indicated that there may be insufficient or excess physicians in some areas even if all factors are considered such as the number of physicians and health care requirements. This is aggravated by the fact that most physiciansare willing to leave the university system and practice in the private sector (4,5).

Iran is a middle-income country and its different parts of health system (private and public sector) considerably vary in terms of various indices such as infrastructure status, input resources including equipment and medical staff, terms of payment, and the rules and regulations. This, along with other factors affecting the unequal distribution of medical staff has worsened the situation. These other factors include socio-economic factors, medical education system, financial incentives, rules and regulations, health system development in the private and public sectors, and management of human resources in the health area in different regions of the country. This resulted in the limited access of people to the required medical and health services in some area and incurred financial burdens to patients. Something that is considered a major challenge in the provision of health services in this country (4-7).

Inappropriate distribution of physicians is a challenge in the human resources of the Canadian health system. This has caused many problems with respect to their attraction and retention (8). Japan also has similar problem, although the number of doctors has increased in recent years (9). Lack of practical solution to deal with this challenge has caused many problems and consequences in both developing and developed countries. This crisis has arisen from various complex causes, which are not only related to the shortage of manpower, but with the inability to retain these forces in the areas where their services are mainly required. The attraction and retention of specialist physicians in university hospitals is a solution to improve the ratio of physicians to the population and thus enhancing the access of people to the health services in different areas of the country (10).

Accordingly, World Health Organization is seeking evidence-based advice to solve the challenge of presence of physicians in the required areas. In this regard, one of the key measures in Iran's Health Promotion Plan was to address the issue of retention of specialist physicians in university hospitals. This plan was aimed at increasing access to and protection of people's finances and the elimination of non-official payments in various areas of the country (11). Manual of “Support Plan for the Retention of Physicians in Less-developed Area” was formulated and implemented in April 2014 in line with the implementation of the provisions of the regulations of the Fifth Development Plan and upstream rules and to realize the provisions of paragraph "b" of Article 34, paragraph "d" of Article 32 and paragraph "b" of Article 36 of the Fifth Development Plan. This plan was put into action in order to increase the public access to thehealth care services, establish a universal coverage, reduce the share of payments by public, strengthen the universal public health system, promote the full-time work plan and ultimately improve the referral system (12). The general and specific goals of this national program are promotion of attraction and retention of physicians in the less-developed regions of the country, promoting equity in access and utilization of health services in underserved areas, reducing the amount

of payments by public, organizing the referral system at specialty and subspecialty levels in the less developed areas and proper implementation of the ranking system in the human resource section and outpatient and hospitalization services. By timely delivery of healthcare services, this program seeks to ensure the provision of appropriate healthcare services and emergency procedures to the public. A process that hopefully results in full-time accountability of hospitals and satisfaction of the public (11-13).

Noticeable measures have been anticipated in the Health Promotion Plan for the retention of physicians in the underserved areas. However, results shows that these incentives were effective for physicians only for a limited time and failed to deliver long-term positive health outcomes. Therefore, Ministry of Health and Medical Education should take into account other strategies, in addition to incentive measures, to increase the retention of specialist physicians in educational hospitals, especially for high-demanding specialties. Given the complex set of factors affecting the retention of physicians, any attempt to increase the number of this workforce group should be accompanied by appropriate measures to attract and retain physicians (10-13).

In recent years, researchers and policy-makers have focused on identifying and implementing appropriate solutions to address the shortage of physicians in some areas. Previous experience has shown that increasing the number of physicians in the whole country is not merely a decisive factor for having enough physicians in underserved areas. Therefore,other factors influencing the attraction and retention of physicians should be identified in order to improve the quality of health care services. Based on these factors, policies are required to be formulated to increase the attraction and retention of physicians in those areas.

Hence, current study aims to investigate the factors affecting the retention of physicians working in training hospitals of Qazvin University of Medical Sciences to provide suggestions and strategies for increasing the retention rate of physicians.

Materials and Methods

This study is a descriptive-analytical survey that is carried out using conjoint analysis technique during 2017-2018 among specialists and subspecialist physicians working in university hospitals affiliated to Qazvin University of Medical Sciences.

Application of Conjoint Analysis Approach

Conjoint analysis (CA) is a comprehensive research method which is based on the economic theory of utility and value originated in mathematical psychology (14). The method is able to determine respondents' preferences for the attributes of a product or service and has been used successfully by many policy-makers and health economists to measure preferences for a diverse range of health applications (15-17).

Conjoint Design

Establishing Attributes and Levels

To create job attributes and corresponding levels from physicians' point of view, an initial literature review was conducted which revealed a list of 20 attributes. In the second phase of the study, the attributes were discussed by a panel of experts including different types of medical specialists whom were asked about factors that could be influential in their decision to retain in training hospitals. After determining eight attributes as the maximum possible features to conduct conjoint analysis, contributing levels were generated in a way to reflect the existing work condition. Through a rational increase in the base level, additional levels were formed. Table 1 show an example of a choice set.

Experimental Design and Construction of Scenarios

Alternative job profiles were created by determining six attributes and related levels. To gain a practical number, $SPSS_{22}$ software and Ortho plan procedure was used. As a result, through applying a fractional factorial design, 16 scenarios were obtained. Then to organize the scenarios in the questionnaire, one of the job profiles relating to retention of physicians in the

workplace was selected as a constant scenario and compared to other job profiles which led to 15 choice sets for each of the physicians.

Study population

The study population consisted of all physicians working in training hospitals of Qazvin University of medical sciences. Subject were selected by census and included in the study only if they do not work in private or social security hospitals. Accordingly, by referring to the list of physicians in the province in the distribution center of physician of Qazvin University of Medical Sciences, a total of 109 physicianswere identified.

Data collection tool

To collect data a questionnaire comprised of two main sections was used. The first section included 16 choice sets for each specialist to regard. In this section, characteristics of scenario are described to help readers to have a better understanding of different scenarios. The second part consisted of a number of socio demographic questions to collect background characteristics of the physicians such as age, gender, and their clinical experience. To observe ethical issues, permission to conduct the research was obtained from Qazvin University of Medical Sciences, Iran, and participation in the study was considered to be voluntarily and informed consent was given.

Data analysis

To obtain study results, gathered data were transformed in to STATA (version 13, Stata Corp LP, College Station, USA) wherein (whether to retain in training hospitals or not) was considered as a binary dependent variable and the levels of the eight attributes were regarded as independent variables. Probit and logistic regression models were used to assess physicians' preferences of scenario levels and characteristics.

To confirm the validity of the study questionnaire according to similar studies that used conjoint analysis method,two following methods were used to confirm the validity of the test. Fractural Factorial Design and Orthogonal method in $SPSS_{22}$ software was used to design the questionnaire and determine the scenarios. In this method, in addition to the main scenario, four scenarios having the best characteristics/ components of the study together with their opposite pairs reflecting the worst conditions were provided to the subjects. Selection of desirable scenario by these subjects reflects their accuracy in responding the questions and confirms the validity of the study. Another method that was used to confirm the validity of the questionnaire was the pre-test questionnaire. In this method, the researcher provided 20 physicians with the pre-designed questionnaire. After the collection of data, researcher team provided assistance to physicians in case of any ambiguity or difficulty in understanding or writing scenarios.

This study has a code of ethics IR.QUMS.REC.1396.403.

Results

The total number of 109 specialist and subspecialist physicians (the whole population under study) employing in educational and medical centers related to Qazvin Medical Sciences University filled in the questionnaires. Most of the participants were females (70 %) and married (84 %). Their age average was 38.59 with 8.07 as their working experience average.

According to Table 2, results demonstrate that study physicians consider activity permission in the private section as the most important feature and workload as the most unimportant one.

The findings in Table 3 show that all the parameters (including activity permission in private section, proximity to family, educational facilities, clinical substructure, and residential facilities) except workload effect on physicians' decision in selecting statistically meaningful service locations (P-value ≤ 0.05).

The coefficients signs of each parameter are consistent with what the researcher has expected which confirms the theoretical validity of the model. It means that in confidence interval 95 % of the physicians have participated in the study, preferred permission to act in private section, proximity to family, having access to proper educational facilities, having access to clinical

facilities and residential facilities.

Comparing coefficients of each parameter level in Table 3 shows that physicians have valued higher levels of each parameter concerning some parameters so that moving to higher levels has effected positively on their choices. This is not true for workload parameters as moving from medium workload to the higher, reduces physicians' intention to persist in the governmental and academic section. In other temporal parameters that defined levels promote from base level to higher one, physicians' persistence probability in service location will be increased.

In Table 4 shows the results of logistic regression on data in Qazvin.

Results of the Table 4 reveal that having permanent activity permission in the private section increases physicians' persistence probability in their service location. So that this possibility may increase physician's persistence probability 1.2 times. Also, findings demonstrate that the physician's persistence probability increases 2.2 times in conditions that the physician has not to be far from his family rather than the conditions that this possibility is provided due to being far from family. The next parameters of proper educational facilities, clinical facilities and also residential facilities may increase physician's persistence probability rather than the condition without such facilities. But as the resultant data from the above Tableshow, proximity to family and permanent activity permission in private sections are the most influential parameters.

The marginal effect has been conducted to investigate the effect of improvement in working conditions on physicians' choice based on persistence. The test determines the effect of change in different levels of each parameter or a collection of parameters on the probability of physicians' occupational choice. Results show that high workload reduces the probability of physicians' persistence in service location around 2 %. However, if physicians assume that the related projects provide them with activity permission in private section, proximity to family, medical facilities and desired residential conditions for them and their families, physicians'' persistence probability will be increased 27 %, 29 %, 19 %, and 12 % respectively. In other words, if policymakers aim at increasing the persistence probability of this physician group in Qazvin, they will be able to increase this probability through changing in the conditions related to policy-making levels of each defined parameter.

Table 1. An example of a choice set

Job A	Job B
Dual practice: Yes	Dual practice: No
Workload: Heavy	Workload: Heavy
Proximity to family: No	Proximity to family: No
Clinical infrastructure: Adequate	Clinical infrastructure: Adequate
Educational facilities: Superior	Educational facilities: Basic
Housing: Basic	Housing: No
Which job profile do you prefer to choose?	Job A ○ job B○

Table 2. Order of importance among study parameters from study physicians' points of view in Qazvin

Components	Model Factors	Standard Error	Z	P
Activity permit in private section	0.842	0.081	8.7	0.00*
Workload	0.038	0.082	0.37	0.5
Closeness to family	0.821	0.078	8.9	0.00*
Educational facilities	0.21	0.08	1.58	0.00*
The clinical substructure of the area	0.92	0.072	4.12	0.00*
Residential Facilities	0.97	0.089	1.84	0.01*

(P-value ≤ 0.05)

Table 3. Effect of change in levels of each study parameters on the choice of study physicians' in Qazvin

Components	Levels of each component	Model Factors	Standard Error	Z	P
Activity permit in private section	Having ratio to not having	0.80	0.083	9.7	0.00
Workload	Average	0.04	0.099	0.49	0.6
	High	- 0.06	0.099	- 0.63	0.5
Closeness to family	Closeness to farness	0.81	0.08	9.7	0.00
Educational facilities	Desirable to undesirable	0.20	0.081	2.51	0.01
The clinical substructure of the area	Average	1.20	0.136	3.85	0.00
	Desirable	0.82	0.083	5.13	0.00
Residential Facilities	Average	1.30	0.099	2.22	0.02
	Desirable	0.22	0.099	3.55	0.00

(P-value ≤ 0.05)

Table 4. Study physician's persistence probability in Qazvin in respect to the change in levels of study parameters

Components	Levels of each component	ORChanceRatio	Standard Error (S.E)	Z	P
Activity permit in private section	No				
	Yes	1.20	0.24	11.4	0.00
Workload	Average	0.17	0.036	0.49	0.62
	High	0.02	0.036	- 0.63	0.52
Closeness to family	No				
	Yes	2.20	0.026	10.9	0.00
Educational facilities	Desirable	1.07	0.028	2.5	0.01
The clinical substructure of the area	Average	1.18	0.047	3.9	0.00
	Desirable	0.96	0.029	5.2	0.00
Residential Facilities	Average	0.08	0.036	2.22	0.02
	Desirable	1.12	0.035	3.5	0.00

(P-value ≤ 0.05)

Discussion

The current study showed important findings related to specialists and subspecialists physicians' occupational preferences and political interventions which affect their persistence in deprived areas. Data analysis revealed that all the parameters expect workload significantly effect on study physicians' preferences in their occupation choice. This finding showed that there is a wide range of political interventions in the improvement of occupation choice probability in deprived areas among physicians. To consider interesting occupational features, physicians prefer to enjoy proximity to family and activity permission in the private section. Moreover, having access to clinical substructure plays an important role in physicians' persistence. Other studies support these findings and emphasize the importance of elements such as proximity to family, enjoying activity permission in private section, proper clinical substructure and residential facilities. Rockers et al (18) showed that dual activity in governmental and private sections increase occupational attraction in deprived areas. Shatouk et al (19) have considered hospital substructures as one of the seven main motivational items among health staff in developing nations. Also, Kerat et al (20) have introduced the promotion of medical equipment as the main job features among medical sciences students. Sobhanian et al (21) have found out that the proximity of service location to residential location is more important than other parameters. Although Rafei' et al (22)

showed that all job features excluding proximity to family significantly effect on job selection and maybe it is because other needs play an important role than emotional one among study physicians.

Study findings revealed that individual or combined motives can enhance specialist and subspecialist physicians' persistence in governmental and academic centers. Hancock et al (23) asserted that Localization in staff recruitment can increase sustainability. Ramsbottom et al (24) revealed that those physicians who are unsatisfied with their workload are more probable to leave their service locations. Therefore, workload suitable for the staff enhances their persistence. Bahadori et al (25) demonstrated that providing welfare amenities may increase physicians' persistence and satisfaction. Miranda et al (26) argued that a combination of motives may increase employment attraction in rural areas. Mousavi Raja et al (27) confirmed that providing livelihood and welfare factors such as desired residential facilities and deprivation in physicians' service locations lead to persistence. Ebadi et al (28) showed that residential and transportation facilities are so important in physicians' points of view. A study in Zambia (29) has suggested governmental residential services, clinical substructures, and educational facilities as important and influential factors in increasing persistence. Sanjari et al (30) have suggested the employment of native forces to increase persistence. Also, Rafei'i et al (22) have introduced salary increase, activity permission in private section and having access to clinical substructures as the most important persistence policies.

Conclusion

Research findings have suggested that considering some parameters which recognized as influential parameters in physicians' decisions can be used in making principled decisions by policymakers to improve physicians' persistence. The analysis showed that some persistence strategies affect job attraction in governmental and academic centers. Providing conditions for proximity to family, legislating agreement with private activity, providing residential facilities, clinical substructures and making suitable academic facilities are the main suggested entries for persistence policy. Due to the insufficient studies about workforces' job preferences in developing nations, the present study will have a significant share in the literature review.

Based on study results it is recommended to provide approximate to family to encourage physicians to persist with various tastes. Also according to the results based on physicians' intention to have activity in the private section besides governmental one, it is recommended to agree with the licensing office for them.

Among the most important challenges in this study are difficulty in collecting data due to the high number of study physicians and also researchers referring to medical and hospital centers. To overcome this challenge attempts have been made to use effective cooperation of Qazvin Medical Sciences University assistance to make physicians cooperate with this study. Also through the researcher's comprehensive explanations about the purpose of the study to physicians, they have significantly contributed to the study. Findings generalizability to other states of the country is impossible due to differences in conditions and substructures in different nations on the country. Also, financial information related to different policies is not mentioned in the study analysis. Therefore it was impossible to determine the most economical scenario.

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Conflict of interests

The authors declare no conflict of interests.

Authors' contributions

Rafiei S, Asefzadeh S, and Kazemifar AM

designed research; Akbari Sh conducted research; Ranjbar M analyzed data; Rafiei S, and Akbari Sh wrote the manuscript. Akbari Sh had primary responsibility for final content. All authors read and approved the final manuscript.

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