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Original Article

Design of a Model for Management of Referral System in the Iranian Urban Family Physician Program

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Abstract

Background: The purpose of this research was to identify the main dimensions of management of referral systems in family physician program and then introduce them to policymakers of the country primary health care.

Methods: This descriptive-correlation study was designed in Mazandaran Province, northern Iran (2017). The participants were employees of health centers of Mazandaran and Fars Provinces, Iran. The dimensions influencing on the referral system were identified systematically in the selected countries by using researcher-made questionnaire according to a statistical method called Factor Analysis. The data sufficiency was evaluated by the Bartlett's and Kaiser-Meyer-Olkin's tests. Reliability of test was calculated and confirmed according to Cronbach's Alpha and Combined Reliability tests. Validity of the test was calculated and confirmed based on the average variance extracted (AVE).

Results: In confirmatory factor analysis, coefficient of effect of Electronic Health Record on referral system (as the most important dimension), coefficient of Family Physician, coefficient of structure of insurance, coefficient of policymaking in health care system, coefficient of proper stewardship of health system, and basic health care services, were 0.887, 0.877, 0.860, 0.804, 0.568, and 0.522, respectively.

Conclusion: Six effective dimensions including Electronic Health Record (as the most important dimension), family physician, structure of insurance, policymaking in health care system, proper stewardship of health system, and basic health care services were identified. According to six effective dimensions on management model of the referral system in the Iranian urban family physician program, the health system authorities pay serious attention to the six identified dimensions of the current study to improve the health of the urban community.

Keywords: Management of referral system; Urban family physician; Factor analysis; Primary health care

Introduction

In recent years, Iran's primary health care has faced many challenges. One of these challenges is the increase of people's expectations for more accesses to specialist physicians. Facilitating people's access to health services plays a significant role in maintaining and improving their health. However, there should be a balance between limited resources of the health sector and the needs and unlimited expectations from people. The Ministry of Health is trying to improve the refer-

ral system of patients, by introducing a family physician program (1). Referral was defined as the action performed when a health expert or physician at a specific level of the health –care system have no enough resources at his or her disposal to treat that clinical condition; that is, they do not have either the skills or the drugs and equipment (2).

Although policy on the referral system of Indonesia's National Health Insurance was proper, its implementation was improper. Since Health Centres ignore the referral system, Outpatient referral was still high. Moreover, the referral was mostly performed based on patient request. It is expected that Health Centres to serve as a gatekeeper so that most of the health challenges can be tackled at the Community Health Center (3).

In Iran, evidence show that quality of the current referral system is not appropriate. For example, in the Northern provinces, the quality of the referral system was inappropriate for 67% of total cases. Only 25.3% of patients were referred to family physicians by second-level specialist physicians (4). Referral rates are considered as important factors for operating the primary healthcares (5).

Due to the failure of the referral system and the design of the health care canters in cities, the most appropriate strategy for solving this problem was suggested by experts in the form of implementing a family physician program (6).

Various factors influence the quality of the referral system, in particular, the referral to specialists in the family physician's program that interacts with each other as cause and effect; thus, any attempt to improve the quality of the referral system at this level requires systematic and harmonious actions and deep recognition of its barriers and challenges (7).

Referral system in primary health care is very important so that 80% to 90% of patients in the first level of health care are recognizable and treatable. Therefore, modification of referral system can reduce greatest the amount of referring patients to the specialist physician in hospitals (8). The implementation of the Family Physician Program can reduce a large amount of expensive and unnecessary visits to specialist physicians. Therefore, the family physician can be considered as a leader in order to offer services from the lowest levels to the highest levels (9). Lack of respect to referral system and freedom of patients by using different parts of referral system has been led to many challenges in primary health care. This has been caused by a crowd of patients in hospitals (10).

After the implementation of the Rural Family Physician Program in 2005 in Iran, since 2012, the Urban Physician Family Program was implemented in Mazandaran and Fars provinces, simultaneously. However, the difference was that in cities, due to the existence of a large number of general and specialist physicians, there were many visits out of a referral system. As a result, this leads to imposing additional costs for both patients and the primary health care of the country.

We aimed to design a model for management of the referral system in the Iranian Urban Family Physician Program and to improve the primary health care by identifying influencing factors (i.e. infrastructures) on the referral system.

Methods

Our method consists of four steps presented as follows.

Step 1: Identifying dimensions of management model of the referral system

The present study was descriptive-correlation research. This step was conducted to extract variables and dimensions of patterns. For this, researcher reviewed the papers, books, essays, and scientific sites related to the Iranian Family Physician Programs and referral systems in selected countries (i.e. Germany, Australia, USA, France, Turkey, Canada, and the UK).

Step 2: Designing questionnaire

In the second step, a questionnaire including 87 questions based on 7 dimensions obtained from step 1 was designed. In the questionnaire, there were 3 variables in the dimension "stewardship

of health system", 11 variables in the dimension "policymaking in health care system", 21 variables in the dimension "structure of insurance", 10 variables in the dimension "Electronic Health Record", 29 variables in the dimension "Family Physician", 7 variables in the dimension "basic health care services", and 6 variables in the dimension "flexibility of referral system". In order to examine reliability, the questionnaire was delivered among 30 subjects and then it was confirmed (Cronbach's alpha reliability coefficient: 0.928).

Step 3: determining sample

In this research, 400 participants (52% females and 48% males) were studied. Sampling adequacy was confirmed by Kaiser-Meyer-Olkin Measure (0.982). The participants were employees of health centers of Mazandaran and Fars Provinces, Iran in 2017. In both provinces, Health Centers were studied. Among staff of each center, 10 participants were selected using purposive sampling method according to criteria such as employment for more than 2 years in the family physician program.

Ethical approval of the study protocol was obtained from the Ethics Committee of Islamic Azad University, Science and Research Branch, and written informed consent was obtained from each participant.

Step 4: Data analysis

The collected data were analyzed using Exploratory Factor Analysis. After conducting Exploratory Factor Analysis and use of varimax rotation method, 7 factors having a value more than 1 were identified. Finally, to validate and extract the final pattern, Confirmatory Factor Analysis was used. The analysis was performed in P.L.S software. In confirmatory factor analysis, Q2 index, significance index, Fornell-Larcker index, and AVE index were used.

Results

In an exploratory analysis, 87 variables of the questionnaire were named according to common concepts among family physician experts based on 7 factors. The factors were policymaking in health care system, structure of insurance, electronic health Record, family physician, stewardship of health system, basic health care services, and flexibility of referral system, respectively. These factors explained 65.458% of the variances so that the first factor had the highest share of variance (19.53%) and the seventh factor had the lowest share (6.757%).

In the factor "policymaking in health care system", the highest weight was related to the 9th question (i.e. Stewardship over the provision of services in referral system. Moreover, the lowest weight was related to the 6th question (i.e. being covered by the insurance organization by the Ministry of Health).

In the factor "structure of insurance", the highest weight was related to the 12th question (i.e. imposing restrictions on the referral of patients to clinics). The lowest weight was related to the 31st question (i.e. the existence of insurance bonuses for the specialist in the case of observance of referral system).

In the factor "Electronic Health Record", the highest weight was related to the 7th question (i.e. Feedback of referral to family physicians through electronic health records. The lowest weight was related to the 5th question (i.e. communication between family physicians and para-clinics through electronic health records).

In the factor "Family Physician", the highest weight was related to the 29th question (i.e. educated family physician on basis of family physician). The lowest weight was related to the 16th question (i.e. rejecting para-clinical manifestations of patients who did not respect the referral system).

In the factor "proper stewardship of health system", the highest weight was related to the 2nd question (i.e. stewardship of all services provided by the Ministry of Health in Family Physician Program). Also, the lowest weight was related to the 1st question (i.e. commitment from governments to Family Physician Program).

In the factor "basic health care services", the highest weight was related to the 80th question (i.e. assigning the right time by family physicians to provide appropriate services to clients). The lowest weight was related to the 79th question (i.e. providing health education by family physicians to prevent and reduce complications related to diseases).

In the factor "flexibility of referral system", the highest weight was related to the 82th question (i.e. allowing people to use hospital services out of referral system through paying higher franchise). The lowest weight was related to the 86th question (i.e. allowing people to use pharmacies services out of referral system through paying higher franchise).

After identifying the factors, a confirmatory factor analysis was used to examine the goodness of the fit of each factor and the overall validation of the model.

For the factors "policymaking in health care system," "Electronic Health Record," "Family Physician" "proper stewardship of health system," and "basic health care services," values of Q2 index, Fornell-Larcker index, and AVE criteria were reported in Tables 1, 2, and 3. As seen in the Tables, significant levels of these factors were less than 0.05. Also, This shows that model had a suitable fitting.

In the factor "flexibility of referral system", significant level was more than 0.05. The test statistic of the effect of the dimension "flexibility of referral system" was 1.6347 (sig=0.000). This shows that the flexibility of referral system did not affect management of the referral system of the family physician.

Table 1: Goodness of fit index in the management model of referral system of Iranian urban family physician program

Cronbach's Alpha	*rho_A*	*Combined reliability*	*Average Variance Extracted (AVE)*	*Variables*
0.7302	0.7503	0.8123	0.5223	The first factor: policy making in health care system
0.8205	0.8387	0.8551	0.5002	The second factor: structure of insurance
0.7365	0.7556	0.8021	0.5339	The third factor: electronic health record
0.7006	0.7505	0.7622	0.5177	The fourth factor: family physician
0.7249	0.8108	0.8106	0.5056	The fifth factor: proper stewardship of health system
0.7641	0.7861	0.8249	0.5712	The sixth factor: Basic health care services
0.9895	0.9926	0.9917	0.9596	The seventh factor: flexibility of referral system
0.8806	0.9136	0.8577	0.4906	Referral system

Table 2: Fornell-Larcker index for measuring the management model of referral system of the urban family physician

Factors	*The first factor*	*The second factor*	*The third factor*	*The fourth factor*	*The fifth factor*	*The sixth factor*	*The seventh factor*
The first factor	0.6842						
The second factor	0.2935	0.6232					
The third factor	0.2372	0.5425	0.5174				
The fourth factor	0.0420	0.3918	0.6798	0.5093			
The fifth factor	0.0738	0.3972	0.5840	0.6409	0.3499		
The sixth factor	0.2040	0.6426	0.8529	0.6691	0.5479	0.5732	
The seventh factor	-0.1192	0.1041	0.1724	0.1413	0.0026	0.1811	0.9796

Table 3: Factors influencing the management model of referral system of the urban family physician

Factors	*Original Sample (O)*	*Standard Deviation (STDEV)*	*T Statistics (|O/STDEV|)*	*P Values*
The first factor	0.568	0.073	7.742	0.001
The second factor	0.804	0.040	20.226	0.0000
The third factor	0.860	0.028	30.727	0.0000
The fourth factor	0.887	0.028	31.829	0.0000
The fifth factor	0.877	0.034	25.914	0.000
The sixth factor	0.5222	0.127	4.112	0.018
The seventh factor	0.213	0.199	1.071	0.575

Discussion

The performance of the health-care system is based on the ability of its infrastructure and the transformational power of its capacity (11).

According to the Fig. 1, our finding showed that six factors influence on the management of the referral system model of the urban Iranian family physician. Among these dimensions, according to experts' opinion, the most important dimension is Electronic Health Record. Electronic Health Record is one of the most important infrastructures in order to implementation of Urban Family Physicians in Iran and referred to it as a communication infrastructure (12). Electronic health records support office visit documentation, prescription writing, lab ordering and review, workflows, billing, and coding. Moreover, built-in decision support and knowledge-management functions contribute to access the latest evidence-based clinical guidelines and lead to the best care for every patient (13).

In this research, family physician was introduced as one of the most effective dimensions on the management of referral system. The existence of a skilled physician can cause patients' confidence and reduce unnecessary referring patients to specialist physicians. Physicians working in Iran PHC system are General Physician not trained as family physician (14). Since the family physician can filter direct access to specialist physicians, it is effective for managing the referral system and it can be considered as the gatekeeper of health-care system (15). Proper training of family physicians improve the quality of referral family and specialist physicians (16). In the current study, the structure of insurance is identified as one of the most effective factors on management model of referral system of the family physician. Proper structure of insurance and clear financial rules for insured persons play important role in the effectiveness of referral system of the family physician because of it can reduce primary health care costs (17). Lack of adequate stewardship of insurance organization on the performance of physicians is

one of the problems in insurance organizations (18). This problem plays the significant role in creating induced demand in the primary health care.

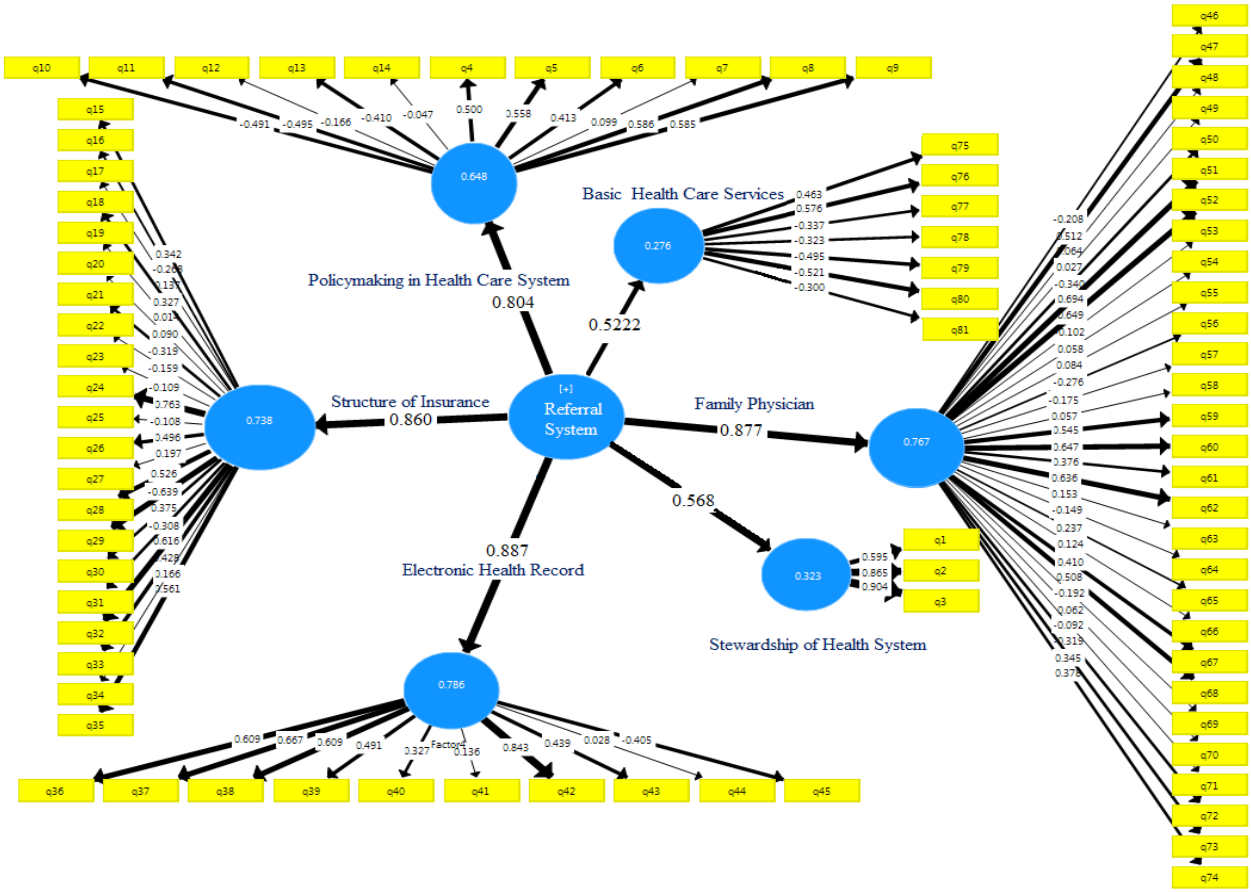

Fig. 1: A model of referral system management for Iranian urban family physician program

In the present study, policy making from primary health care was introduced as one the effective factors in primary health care. If family physician policy is properly implemented, the advantages such as reduction of medical costs, proper leading of patients in referral system, and reduction in unnecessary referring to specialist physicians will be provided (19). Policy making in health-care system influences physician and patient's choices. In many ways, it limits patient's choices (20).

In order to economic and human development, it is important to promote the quality of health services. Timely access and inexpensive services are two main characteristics of a proper health system policymaking (21).

Integrated stewardship of health system is one of the important factors for implementation of the urban family physician in Iran (12). Moreover, at present, many clinics and hospitals of Iran are Out of stewardship of the Ministry of Health. The introduction of the Basic Benefits Package (BBP) has resulted in improved referral from PHC to specialist services and lower hospitalization rates. (7, 22). Basket of services is one of the most important dimensions in family physician (11, 12).

Conclusion

The most important dimensions of the management model of referral system of the Urban Ira-

nian family physician are electronic health record, Family Physician, structure of insurance, policy making in primary health care, stewardship of health system, and basic health care services, respectively. Over the past few years, the establishment of urban family physician program and referral system in cities have been given the attention of policymakers of the country's primary health care. Since, at present, this program is only being implemented in Mazandaran and Fars provinces, and will be implemented as soon as across the country, more attentions by policymakers in primary health care are required. We hope that necessary infrastructures for the implementation of urban Family Physician be provided to improve the health of the urban community and reduce the costs of the primary health care.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of interest

The authors declare that there is no conflict of interest.

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