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Clinical instructors' recruitment challenges: Interpretive Structural Modeling approach

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Abstract:

CONTEXT: Universities of medical sciences are responsible for educating and training human resources (HRs) that provide services to all members of the community. Clinical educators play a significant role in the promotion of health and education in medical sciences universities.

AIMS: The aim of this study was to prioritize and develop a model to illustrate the relationship between faculty recruitment challenges in medical sciences universities.

SETTINGS AND DESIGN: Interpretive structural modeling (ISM) is a system design method initially introduced by Warfield (1974). This method helps create order in the complex interconnections between components of a system by interpreting the opinions of a group of experts. It both determines the priority of elements influencing one another and uncovers the association between the elements of a multipart set in a hierarchical structure.

SUBJECTS AND METHODS: In this method, the identified challenges were built into a paired comparison questionnaire to be completed by policymakers and experts. By the same token, the obtained results were analyzed with the ISM technique.

STATISTICAL ANALYSIS: The four steps include identified variables related to the issue, structural self-interaction matrix, initial reachability matrix, and final reachability matrix was used for analysis. According to these steps, the ISM model was portrayed.

RESULTS: The ISM model was developed in ten levels that divided into three parts including key challenges, strategic challenges, and dependent challenges.

CONCLUSION: Health promotion and quality of education in medical sciences universities is dependent on quality of faculty recruitment system. According to the results, it is imperative that HR managers and policymakers improve existing rules and develop policies to solve the challenges in this area.

Keywords:

Educator, human resource, interpretive structural modeling, recruitment

Introduction

Strategic human resource (HR) goal is to provide the appropriate staff to achieve the organization's targets.^[1] Smart managers have found that increasing their organization's efficiency is possible through the development and promotion of skilled and efficient staff.^[2] In this way, the medical universities are no exception.

Universities of medical sciences have a unique position in training and providing medical services.^[3]

The educators have a significant role on quality of educational and therapeutic services in educational systems. Then, one of the ways to promote universities of medical sciences is to identify and provide efficient educators.^[4] In medical universities, educators are divided into two groups of basic sciences and clinical

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sciences. In addition to treating patients, clinical educators are responsible for training medical and paramedical students. The job position of these faculties is highly important because the clinical environment involves unique challenges. Despite the complexity and importance of this environment, many doctors and specialists enter this arena without the required preparation and knowledge. Undoubtedly, lack of effectiveness and efficiency in clinical education sector lead to problems for community.^[5]

In cases, faculties spend only 30% of their time at university, and the grand round is performed only in 10% of the departments.^[6] It is imperative that the recruitment of clinical faculty members is based on love, interest, and motivation. Educators are role models who can affect students' motivation, mental health, and capabilities. Duane (2006) believes that a teacher's nonprofessional behavior, including unnecessary stress, threat, and humiliation, are conducive to students' learning and may encourage students to show similar behaviors in future.^[7]

Due to position of the clinical instructors in medical sciences universities, it is necessary to analyze and ranking the challenges related to their employment to improve them. Interpretive structural modeling (ISM) approach is mainly applied to illustrate the relationship between the factors associated with an issue or challenges. In recent years, utilization of ISM approach has enormously increased in different application areas such as safety, health, environment management, risk control design, and Olympic.^[8]

Shabani *et al.* used ISM technique for ranking the factors that effect on the educational quality. The results showed that the use of experienced educators is one of the most critical factors affecting the educational quality.^[9] Hashemi Dehaghi *et al.* used an ISM to determine the driving and dependence power of the elements of quality of services to cataract patients. Based on the ISM, the variables "technology and innovation capability" and "reliability" have the most impact on the model and were the basis of the model.^[10] Karimi Shirazi used ISM approach for improving the quality of clinical dental services. The results showed that for improving the quality of its services, the dental clinic has to pay attention to providing services, the delivery of services with care, timely responding, a consistent quality of services, and the speed of services.^[11] Talib and Rahman adapted an ISM in their study for rank and classify key quality dimensions for health-care establishments sustainable in hospital services. The integrated model revealed quality dimensions such as "state of knowledge management" "patient expectation and perception of hospital services."^[12]

Clinical educators are an important organizational HR, play an important role in promoting efficiency in medical universities. The objective of this study was to identify the most dominant challenges among the identified challenges and investigate the imperative and mutual relationship of the nineteen challenges for the clinical educators' recruitment system, and finally to develop ISM based model of these challenges.

Subjects and Methods

This study was conducted in Isfahan University. we adapted ISM to ranking the identified challenges in clinical educators' recruitment system. ISM is a system design method initially introduced by Warfield (1974). The method helps create order in the complex interconnections between components of a system by interpreting the opinions of a group of experts. It both determines the priority of elements influencing one another and uncovers the association between the elements of a multipart set in a hierarchical structure.^[9,13]

The steps of ISM are as follows [Figure 1].^[14-16]

Step 1: Identified variables related to the issue

The first step in ISM named identified variables related to the issue. These variables were obtained from literature review on issue and expert panel. In this study, variables including clinical educator's recruitment challenges were extracted from a semi-structured interview in another project [Table 1].

Step 2: Structural self-interaction matrix

In the second step, the identified challenges were built into a paired comparison questionnaire [Table 2]. At a session, six policymakers and experts including a head of the university of medical sciences, two educational assistants, one clinical faculty member, a head of educational development center, and one consultant from the ministry of health and medical education agreed on the concept of challenges and then completed the matrix according to the instructions shown in Table 3.

The rules of conceptual relationships in formation of a structural self-interaction matrix (SSIM) explain: If challenge i influences challenge j, symbol V is selected. If challenge j influences challenge i, symbol A is selected. If challenges i and j influence each other, symbol X is selected, and if challenges i and j are unrelated, symbol O is selected^[17] [Table 3].

After completing the paired comparison questionnaire, the SSIM was developed [Table 3]. In this study, several experts completed the questionnaires [Table 4]. We used the most frequently method to develop the reachability matrix.^[9]

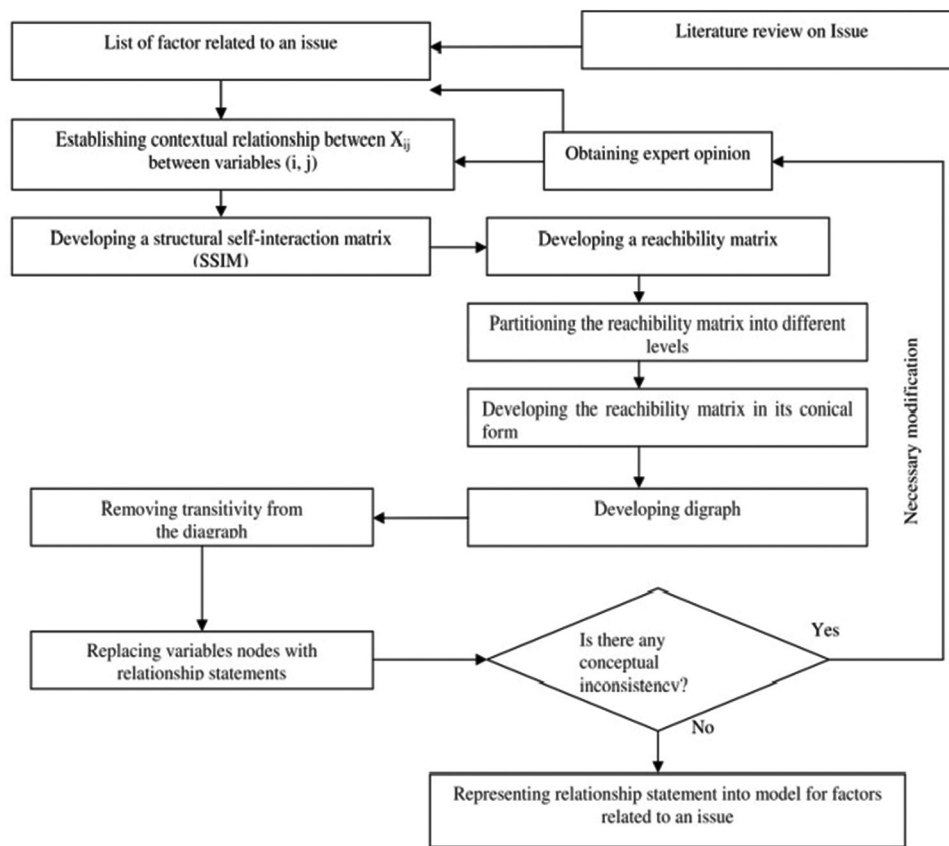


Figure 1: Flow diagram for preparing interpretive structural modeling model^[14-16]

Table 1: The identified challenges related to clinical educator's recruitment system

Challenge number	Challenges
C1	Reluctance of departments on increase in human resources
C2	The low ratio of teacher to student in some departments
C3	The high proportion of educator to the student ratio in some departments
C4	Lack of supportive system for termination of contracts at university's discretion
C5	Weakness of the infrastructure to use non-faculty teachers
C6	Recruitment based on faculty's needs in treatment sector
C7	Not using different techniques to recruit clinical educators
C8	Noncompliance of rules with clinical work conditions
C9	Being unable to do all seven responsibilities by clinical educators
C10	The impact of the Geographical Full-Time Code on reduced motivation of individuals
C11	Declaring the need for universities of type 1 and 2 concurrently is the basis for completing the capacity of Brigade 2 by weak people
C12	Uniform process of recruiting basic and clinical educators
C13	Purpose-based calls to recruit specified individuals
C14	Inadequate clinical competence assessment
C15	Insufficient examination of moral and professional qualifications
C16	Inadequate assessment of teaching talent and love
C17	Recruitment which is based on the score given by the national board of medical examiners
C18	Weakness in implementing payment system
C19	The difference in revenue between the private and public sector reduced the motivation

Step 3: Initial reachability matrix

The initial reachability matrix was constructed from SSIM [Table 4]. Symbols V, A, X, and O of the SSIM were tabernacle by 1s or 0s to construct initial reachability matrix.^[14,18]

The rules of initial reachability matrix explain: In the symbol V, if challenge i influences challenge j, symbol V exchanges to 1; if challenge j influences challenge i, symbol V exchanges to 0. In the symbol A, if challenge i influences challenge j, symbol A exchanges to 0; if

Table 2: Paired comparison questionnaire

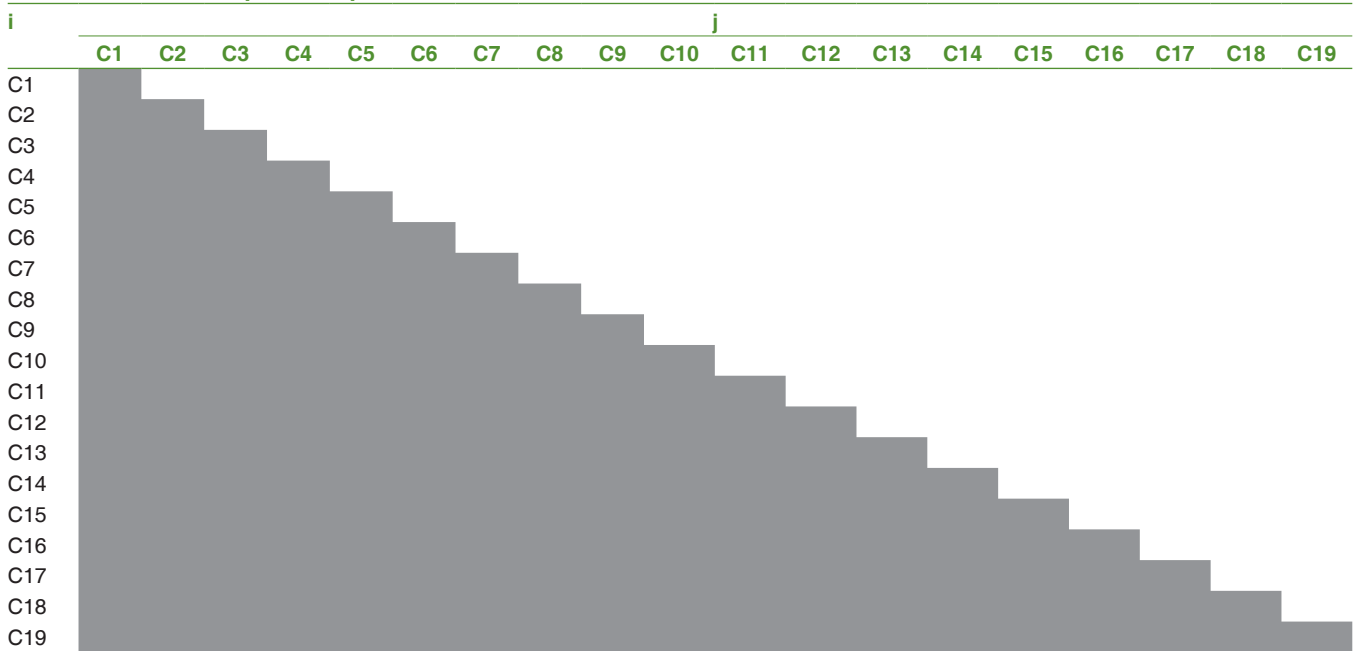


Table 3: Conceptual relationships in the formation of a structural self-interaction matrix

Symbol	Definition
V	If factor i will influence factor j
A	If factor j will influence factor i
X	If factors i and j influence each other
O	If factors i and j are unrelated

SSIM=Structural self-interaction matrix

challenge j influences challenge i, symbol A exchanges to 1. In the symbol X, if challenge i influences challenge j or challenge j influences challenge i, symbol X exchanges to 1, and finally symbol O in both cases exchanges to 0 [Table 5].

Step 4 Final reachability matrix

Final reachability matrix was constructed from the initial reachability matrix. This matrix was checked for transmissibility. The transmissibility of the contextual relation is a basic presumption made in ISM. It explains that if a C1 influences C6 and C6 influences C9 Consequently C1 leads to C9.^[14] Modified layers are shown with *1 in Table 6.

Level partitions

The different levels of this analysis consist of the challenge reachability set, the antecedent set, and the intersection set. The reachability matrix is used to generate the reachability and antecedent sets for each challenge. The reachability set comprises the challenge itself and the challenges that it may help reach. The antecedent set involves the challenge itself and the other challenges that influencing the challenge. The intersection set for each challenge includes the shared

challenges between the reachability and the antecedent sets. A challenge is placed on the top level in case the reachability and intersection sets are identical.^[20] Table 7 depicts the reachability set, the antecedent set, and the intersection set and levels.

Interpretive structural modeling-based model

Interpretive structural model was plotted using Table 7 [Figure 2]. This model consists of ten levels. Challenges at the higher levels have the less effective (levels 1–3) and challenges at low levels are basic and levels 8–10 have the most effective on other challenges and the recruitment system.

Results

We used expert opinions as a foundation for the ISM to model and analyze the relationship between the challenges identified for recruiting clinical educators.

Challenges in this model have been grouped into three categories: key challenges, strategic challenges, and dependent challenges.^[20] The holistic model is logical, and the relationship between the challenges depicts a picture of the effective factors and contributors.

Some challenges are placed at the lowest level of the ISM model due to their high impact on other challenges. They include weakness of the infrastructure to use nonfaculty teachers (C5), noncompliance of rules with clinical work conditions (C8), purpose-based calls to recruit prespecified individuals (C13), nonuse of different techniques to recruit clinical educators (C7), and the difference in revenue between the private and public

Table 4: Structural self-interaction matrix

i	j																		
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19
C1		V	O	X	V	A	V	O	O	O	O	O	A	A	A	A	O	O	O
C2			O	A	A	O	A	A	V	A	O	A	O	O	O	O	O	A	A
C3				O	O	A	V	O	O	O	O	O	A	O	O	O	O	O	O
C4					O	O	X	O	O	O	O	O	O	V	V	V	O	O	O
C5						O	V	O	V	V	O	V	O	O	O	O	O	O	O
C6							A	A	V	O	O	O	O	O	O	O	O	O	A
C7								A	O	V	O	V	O	V	V	V	X	O	O
C8									V	O	O	O	O	O	O	O	O	O	O
C9										O	O	O	O	O	O	O	O	O	O
C10											O	O	O	O	O	O	O	X	X
C11												O	O	O	O	O	O	O	O
C12													O	V	V	V	O	O	O
C13															V	V	V	O	O
C14																X	X	A	O
C15																	X	X	O
C16																		X	O
C17																			O
C18																			
C19																			X

Table 5: Rules of reachability matrix^[19]

Symbols	i to j	j to i
V	1	0
A	0	1
X	1	1
O	0	0

sectors (C19) [Figure 2]. These are the “key challenges,” and any attempt to solve them can facilitate the solution of other challenges.

The high educator-to-student ratio in some departments (C3), recruitment based on the score given by the National Board of Medical Examiners (C17), reluctance of departments in increasing HRs (C1), and lack of a supportive system for termination of contracts at the university’s discretion (C4) are in the middle level of the ISM model. These challenges are known as “strategic challenges” due to their high influence power [Figure 2]. They are influential in the recruitment system and should be considered by managers due to their high impact on other factors.

At the highest level of the ISM model are the dependent challenges because of their strong dependence on other challenges. They include inadequate clinical competence assessment (C14), insufficient examination of moral and professional qualifications (C15), recruitment based on the need for clinical educators in the treatment sector (C6), inadequate assessment of the talent and love for teaching (C16), the low educator-to-student ratio in some departments (C2), being unable to do all the seven responsibilities by clinical educators (C9), and concurrent

call at type 1 and 2 universities as a basis for recruiting weaker candidates (C11) [Figure 2].

Discussion

Identifying and ranking the challenges of clinical instructor’s employment is essential for improving the recruitment process. These challenges have interactions and internal affiliation with each other. To identify relationship and sequence of challenges, this study was done.

The weakness of the infrastructures including the laws, rules, and administrative regulations to use nonfaculty teachers is one of the critical factors in this model. As permanent recruitment will impose substantial costs on the system, individuals must be recruited for a specified period based on HR management principles. Mosadegh *et al.* suggested that the necessary conditions should be provided for recruiting part-time educators in the universities. They also believed that opportunity should be created that would allow individuals with specific abilities to be employed although they may not currently have the enacted conditions and attributes.^[21] In the United States, Canada, European Union, and other countries, many of people are employed part time.^[22] Haines *et al.* in their research confirmed that a broad range of part-time situations to be a better reflection of modern employment. They explain that the flexibility to workforce involved in part-time employment is useful.^[23]

While income in this model is in the key factors place, it had the least effect on the motivation of educators in the study of Safi *et al.* They prioritized the contributory

Table 6: Final reachability matrix

i	j																		
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19
C1	1	1	0	1	1	1*	1	0	1*	1*	0	1*	0	1*	1*0	1*	1*	0	0
C2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
C3	0	1*	1	1*	0	1*	1	0	0	1*	0	1*	0	1*	1*0	1*0	1*0	0	0
C4	1	1	0	1	0	0	1	0	1*0	0	0	0	0	1	1	1	0	0	0
C5	0	1	0	1*0	1	1*0	1	0	1	1	0	1	0	1*	1*0	1*0	1*0	1*	1*0
C6	1	1*	1	1*	1*	1	1*	0	1	1*	0	1*	0	1*	1*	1*0	1*0	0	0
C7	1*	1	1*	1	1*	1	1	0	1*0	1	0	1	0	1	1	1	1	1*	1*0
C8	1*	1	1*	1*0	1*0	1	1	1	1	1*0	0	1*0	0	1*	1*0	1*0	1*0	0	1*
C9	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
C10	0	1	0	0	0	1*0	0	0	1*0	1	0	0	0	0	0	0	0	1	1
C11	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
C12	1*	1	0	0	0	0	0	0	0	1*	0	1	0	1	1	1	0	0	0
C13	1	1*	1	1*	1*	1*	1*	0	1*	1*	0	1*	1	1	1	1	1*	0	0
C14	1	1*	0	1*	1*	1*	1*	0	1*	1*	0	1*	0	1	1	1	1*	0	0
C15	1	1*	0	1*	1*	1*	1*	0	1*	1*	0	1*	0	1	1	1	1*	0	0
C16	1	1*	0	1*	1*	1*	1*	0	1*	1*	0	1*	0	1	1	1	1*	0	0
C17	1*	1	1*	1	1*	1*	1	0	1*	1*	0	1*	0	1	1	1	1	1*	1*
C18	0	1	0	0	0	1*	0	0	1*	1	0	0	0	0	0	0	0	1	1
C19	1*	1	1*	1*	1*	1	1*	0	1*	1	0	1*	0	1*	1*	1*	1*	1	1

*1: Modified layers are shown with *1

Table 7: The first iteration to find levels of clinical educators' recruitment challenges

Challenge number	Reachability set	Antecedent sets	Intersection set	Level
C1	1.2.4.5.6.7.9.10.12.14.15.16.17	1.4.6.7.8.12.13.14.15.16.17.19	1.2.4.5.6.7.12.14.15.16.17	5
C2	2.9	1.2.3.4.5.6.7.8.10.12.13.14.15.16.17.19	2	2
C3	2.3.4.6.7.10.12.14.15.16.17	3.6.7.8.13.19	3.6.7	7
C4	1.2.4.5.6.7.9.10.14.15.16	1.3.4.5.6.7.8.14.15.16.17	1.4.5.6.7.14.15.16	5
C5	2.4.5.6.7.9.10.12.14.15.16.17.18.19	1.4.5.6.14.15.16	4.5.6.14.15.16	10
C6	1.2.3.4.5.6.7.9	1.3.4.5.6.7.8.10.17.18.19	1.3.4.5.6.7	3
C7	1.2.3.4.6.7.9.10.12.14.15.16.17.18.19	1.3.4.5.6.7.8.13.14.15.16.17	1.3.4.6.7.14.15.16.17	9
C8	1.2.3.4.6.7.8.9.10.12.14.15.16.17	8	8	10
C9	9	1.2.4.5.6.7.8.9.10.12.17.18.19	9	1
C10	2.6.9.10.18.19	1.3.4.5.7.8.10.18.19	10.18.19	4
C11	11	11	11	1
C12	1.2.9.12.14.15.16	1.3.5.7.8.12	1.12	4
C13	1.3.7.13.14.15.16	13	13	10
C14	1.2.4.5.7.14.15.16	1.3.4.5.7.8.12.13.14.15.16.17	1.4.5.7.14.15.16	3
C15	1.2.4.5.7.14.15.16	1.2.3.4.5.7.8.13.14.15.16.17	1.4.5.7.14.15.16	3
C16	1.2.4.5.7.14.15.16	1.3.4.5.7.8.12.13.14.15.16.17	1.4.5.7.14.15.16	3
C17	1.2.4.6.7.9.14.15.16.17	1.3.5.7.8.17	1.7.17	6
C18	2.6.9.10.18.19	5.7.10.18.19	10.18.19	4
C19	1.2.3.6.9.10.18.19	5.7.10.18.19	10.18.19	8

factors to teachers' motivations using the principal component analysis method.^[24] However, the results of Salmanzadeh and Maleki study confirmed that economic factors play an important role in motivation of individuals.^[25] Malik in his study expressed that good salary in ranking the faculty motivation is in the second place.^[26] Also, Tenzer showed that higher pay is the top incentives that drive faculty to teach online and enabling college-level administrators to make decisions targeted at retaining and hiring a qualified online teaching pool.^[27]

Although the holistic model is logical, the purpose-based calls to recruit prespecified individuals are interestingly among the "key challenges." Albeit this is based on the opinions of experts, this bitter reality is happening. Department heads prefer to recruit familiar individuals. They may appear to be suitable candidates for a job position, but not at all conditions. Adopting people based on ethnic, religious, and political issues, among others, is contrary to "the principle of merit hiring." The Universal Declaration of Human Rights states that

"everyone has the right of equal access to public service in his/her country."^[28]

Lack of a supportive system for termination of contracts at the university's discretion (as a strategic challenge) is caused by other challenges such as lack of rules or noncompliance with the rules (as key challenges).

Strategic challenges can, in turn, affect other recruitment challenges. For example, recruitment that is based on the score given by the National Board of Medical Examiners leads to inadequate assessment of clinical competence, the insufficient examination of moral and professional qualifications, and inadequate assessment of the teaching talent and affection. The score given by

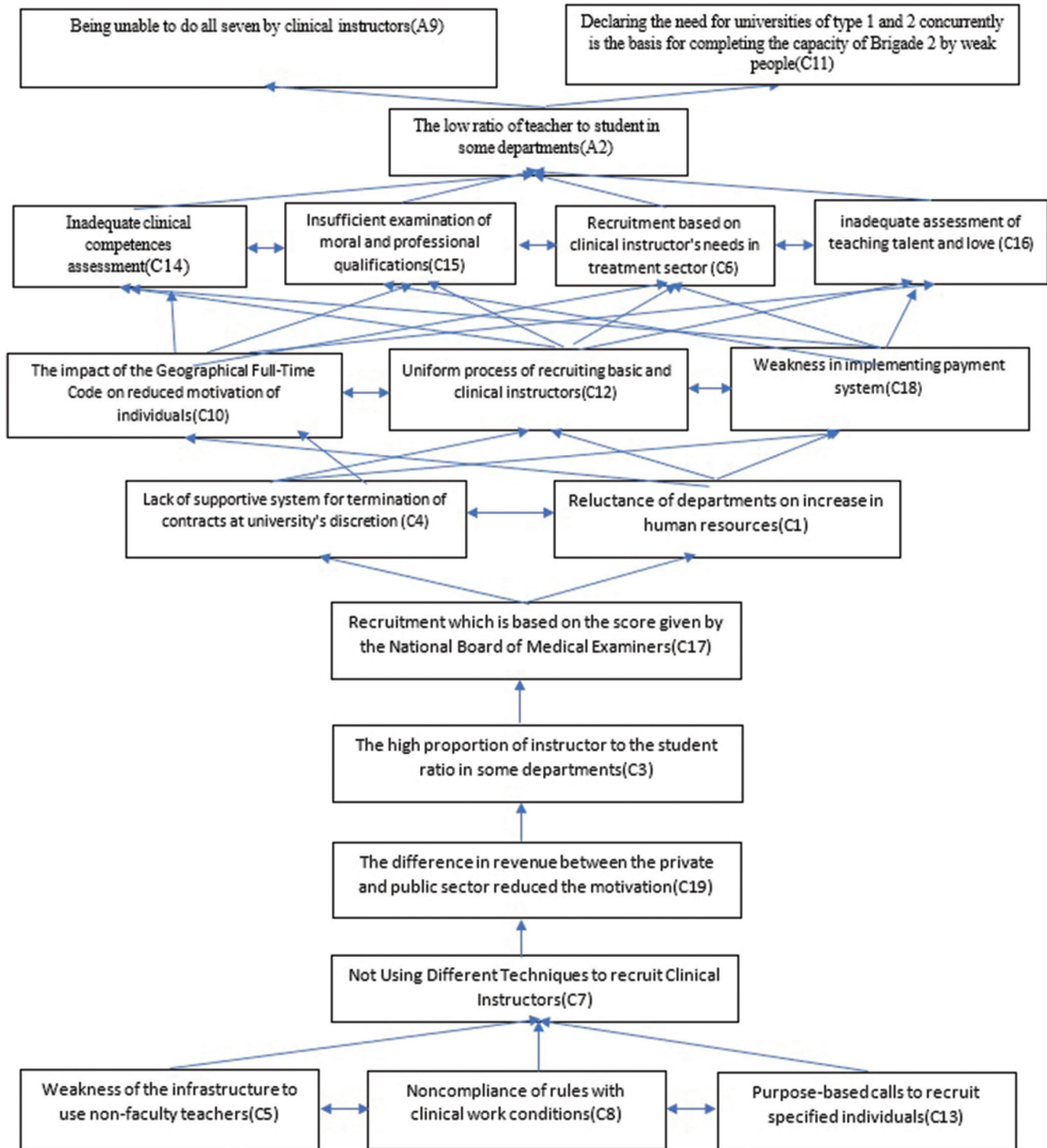


Figure 2: ISM based model for clinical educators' recruitment challenges

the board is believed to reflect an individual's abilities, while the score represents only some of the volunteer's competencies, not all the competencies required for teaching position.

Inadequate clinical competency assessment, the insufficient examination of moral and professional qualifications, and inadequate assessment of the teaching talent and love are posited at the "dependent challenges group." Although these challenges (C14, C15, and C16) are very important in the recruitment system and should expectedly be among the key factors group, the experts' ideas indicate that there are underlying factors that create these challenges in the recruitment system. Given the importance of these challenges, we suggest that managers and policymakers pay attention to improving selective manners. Mohammadi *et al.* used an analytical network process to draw up a selection model for faculty members. In this model, the scientific dimension of the clinical educator was placed on the first level (the essential dimension), and the moral dimension was placed on the third level.^[29] Posthuma *et al.* in their study compares job interviews in Mexico with Belgium, Russia, Taiwan, and U. S. family condition, marital status and children, reasons for quitting their last job, applicants' wage, salary expectations, applicants value, opinion, and beliefs asked at interview sessions.^[30]

It is necessary that managers and policymakers consider all aspect of challenges. However, the ISM model helps identify crucial and strategic affecting factors. Unfortunately, this model has been implemented in a few numbers of health studies. The application of various industrial techniques in health studies will improve the medical researches.

Conclusion

We used of the ISM model to portrait the relationship and the impact of challenges in the recruitment system. The results of this study showed that the challenges at lower levels as underlying factors have been created due to weaknesses in the rules or inappropriate use of existing laws. Policymakers' attention is needed to reform the rules.

However, it is important to improve all nineteen challenges, but according to IMS results improving the key challenges will affect the entire system.

Hence, there is hope that the reform of these basic rules will correct other challenges.

Limitation

The limitation of this study is related to intrinsic limitations of the ISM technique. The ISM technique

ranking the factors but cannot determine the severity of the impact of variables. Another limitation is that ISM is based on expert judgment.

Ethical code number

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Conflicts of interest

There are no conflicts of interest.

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