

Potential Factors of Medical Specialist Allocation in a Private Hospital Network in Thailand: A Modified Delphi Study

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Abstract

OBJECTIVES: Medical specialist allocation is crucial for achieving equitable access to specialized care. Given the scarcity of data from the private sector, this study aimed to identify potential factors of medical specialist allocation within the largest private hospital network in Thailand.

MATERIAL AND METHODS: For standardization and comparison, based on the identified key point, the modified four-round Delphi study together with expert interviews from both public and private sectors were used. A total of 43 top executives from 32 hospital representatives of the Bangkok Dusit Medical Services (BDMS) participated by responding to a 5-point Likert scale for ranking the item that could influence the allocation of medical specialists. The items with interquartile range (IQR) of < 1.5 and mean values > 4 were considered as potential factors.

RESULT: Thirty-five out of 46 factors were statistically significant and were identified as potential factors of medical specialist allocation. Of the 35 factors, 6 potential factors were considered as the most affected potential factors of medical specialist allocation: 1) health need of the population, 2) organization's mission, 3) organization's Hoshin, 4) organization's strategy, 5) complexity of the patients, and 6) severity of the patients.

CONCLUSION: Six factors that might influence the allocation of medical specialists were identified and could be useful for medical allocation in a private hospital network.

Keywords: potential factor, medical specialist, allocation, private hospital, modified Delphi study

According to the World Health Organization (WHO)¹ in the year of 2010, the data showed that there has been a shortage and maldistribution of physicians in Thailand compared to other developed countries worldwide, particularly in the Southeast Asia region. Moreover, the shortage of medical specialists has been even more pronounced.^{2,3} A good understanding of how medical specialists are distributed would promote the quality and efficiency of healthcare services. This is also very critical for medical specialist resource allocation between the private and public hospital network. However, the research data has been limited and not thoroughly explored so far.

For the public healthcare system, copious factors affect the demand for physician's services such as population dynamics (graying population, zero population growth), changes in types of public health services and technologies, changes in economic and social status (urbanization), epidemics and pandemics of diseases (HIV, Zika). All these lead to changes in response in the supply and distribution of physicians and physician specialists in particular.

For the private hospital healthcare system, the number of physicians required for each hospital depends on the missions and characteristics of each individual hospital^{4,5} such as hospital's level, size, facilities, and service plans, the number of inpatients and outpatients, the complexity and severity of the patients, the work hours per patient day (HPPD), the patient-physician relationship, and the Quality Assurance Services.^{2,4-13}

Evidence on how medical specialists are allocated would be useful for achieving equitable access to specialized care. Due to limited data from the public sector, therefore, this study is designed to be the first consensus-based

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Received: November 15, 2018
Revision received: November 23, 2018
Accepted after revision: July 23, 2019
BKK Med J 2019;15(2): 198-202.
DOI: 10.31524/bkkmedj.2019.09.013
www.bangkokmedjournal.com

survey in Thailand. The purpose of this study was to find potential factors which will serve as a model for medical specialist allocation in a large private hospital network in Thailand.

Materials and Methods

This four-round modified Delphi survey¹⁴ was done by using a questionnaire containing potential factors identified from reviewing published literature as well as interviewing the experts who had extensive experience with human resource management or hospital management in the public and private sectors. Executives who were part of BDMS management for 1 year or more were recruited from 32 hospitals. The respondents were chosen based upon their willingness to respond to the survey and if they met required criteria as follows: a) be in position assistant of director or above, b) have extensive experience with human resource management or hospital management for at least 3 years.

Questionnaire

The questionnaire for this study was developed from published literature review and was reviewed by the experts from both public and private sectors for face validity. For standardization and comparison, based on the identified key points in the questionnaire, all factors were derived by the modified four-round Delphi study.

Data Collection

The first round was conducted among 32 representative hospitals. Each nominated executive was emailed a cover letter outlining the objective of the study along with a six-page questionnaire. The questionnaire comprised two parts:

Part 1: contains the demographic data (gender, age, education, job position, and administrative experience) of participants.

Part 2: the participants are asked to rank 43 items and add on factors that will possibly influence the allocation of medical specialists in a free text response.

In round 2, each executive received a questionnaire survey comprising 46 items along with the responses from round 1. In round 3, each executive received a questionnaire survey, comprising all 46 items from round 2 with the participants' own response and the group's response from round 2. In round 4, executives were asked to reconsider their responses in the final round.

Data Analysis

Descriptive data were presented as absolute numbers and percentages. As the survey was conducted in four rounds, items with inconsistent values across the four rounds determined by the interquartile range (IQR) larger than 1.5, were considered unreliable and, therefore, were excluded. All items remaining after the fourth round were considered as potential factors; their means and standard deviations were presented.

All statistical analyses are performed using IBM Statistical Package for Social Sciences (SPSS). Version 22 for Windows.

Ethical Considerations

This study was approved by the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University (IRB No.387/2558) and Institutional Review Board of Bangkok Hospital Headquarters (IRB No.2015-09-044). All participants provided written informed consent.

Results

Forty- three top executives of BDMS hospital network were interviewed, 43 executives completed questionnaires in round 1 (100%), 41 of 43 completed questionnaires in round 2 (95.35%), 39 of 41 completed questionnaire in round 3 (95.12%) and 31 of 39 (79.49%) completely participated in the fourth round of the survey. The characteristics of the executives in the first round and fourth round are shown in Table 1. The questionnaire for this study was developed based on 46 items identified from the reviews and interviews, 11 items were excluded because of inconsistent values and 35 factors were considered as potential factors of medical specialist allocation (Table 2).

Table 1: The Characteristics of Executives in the First round and Fourth round

Characteristics	First Round (n = 43)	First Round (n = 31)
Gender		
Male	42 (97.7%)	30 (96.8%)
Female	1 (2.3%)	1 (3.2%)
Age		
31-40	1 (2.3%)	9 (29.0%)
41-50	13 (30.2%)	14 (45.2%)
51-60	19 (44.2%)	8 (25.8%)
> 60	10 (23.3%)	0
Education		
Bachelor Degree	5 (11.6%)	2 (6.5%)
Master Degree	24 (55.8%)	18 (58.1%)
Doctoral Degree	14 (32.6%)	11 (35.5%)
Work position		
Vice President	1 (2.3%)	3 (9.7%)
Chief Executive Officer	5 (11.6%)	20 (64.5%)
Hospital Director	25 (58.1%)	3 (9.7%)
Deputy Hospital Director	3 (7%)	2 (6.5%)
Assistant Hospital Director	6 (14%)	1 (3.2%)
Chief Medical Officer	1 (2.3%)	2 (6.5%)
Assistant Chief Medical Officer	2 (4.65%)	0
Administrative Experience (years)		
1-5	5 (11.6%)	4 (12.9%)
6-10	7 (16.3%)	5 (16.1%)
11-15	14 (32.6%)	9 (29.0%)
16-20	10 (23.3%)	7 (22.6%)
21-25	5 (11.6%)	3 (9.7%)
26-30	2 (4.7%)	3 (9.7%)

Table 2: Potential factors of medical specialist allocation

Thirty- five factors were considered as potential factors of medical specialist allocation.							
No	Points	Mean	SD	No	Points	Mean	SD
1	Population Structure *	4.161	0.779	19	Quality Assurance of Hospital *	4.194	0.703
2	Health Need of population *	4.516	0.570	20	Human Resource Management of Administrator *	4.000	0.683
3	Economic and Social Change *	4.226	0.669	21	Availability of human resources for Healthcare *	4.194	0.543
4	Cause of Death *	4.129	0.562	25	Qualification and Competency of doctor*	4.355	0.709
5	Burden of Disease *	4.194	0.543	26	Behaviors of Doctor *	4.097	0.700
6	Policy of Country *	4.000	0.577	27	Attitude for helping Hospital Network *	4.032	0.752
7	Policy of Physician specialist allocation in Private Hospital Network *	4.226	0.669	32	Complexity of patient *	4.548	0.568
8	Organization's mission *	4.645	0.486	33	Severity of patient *	4.548	0.624
9	Organization's Hoshin *	4.710	0.461	36	No. of OPD visit *	4.161	0.688
10	Organization's strategy *	4.774	0.425	37	No. of IPD *	4.161	0.688
11	Case Mix Index *	4.194	0.654	38	No. of surgical case *	4.194	0.654
12	Services provided by Hospital *	4.419	0.564	39	No. of refer in *	4.097	0.870
13	Medical technology used *	4.323	0.599	41	Bed Occupancy rate *	4.000	0.730
14	Location of hospital *	4.065	0.629	42	No. of Admission *	4.097	0.700
15	Type of hospital *	4.323	0.541	43	Revenue of Doctor *	4.194	0.703
16	Size of Hospital *	4.226	0.497	44	Responsibility and Discipline *	4.161	0.688
17	Revenue of Hospital *	4.161	0.583	45	Benefit and Welfare *	4.097	0.700
18	Hospital reputation *	4.258	0.631				
Eleven factors were excluded because of inconsistent values							
No	Points	Mean	SD	No	Points	Mean	SD
22	Information system for Human resource forecasting	3.968	0.547	31	Doctor's Marital status	3.000	0.856
23	Residence of Doctor	3.903	0.746	34	Working hours (IPD& OPD)	3.903	0.790
24	Patient and Doctor relationship	3.806	0.792	35	Number of Hospital beds	3.935	0.814
28	Generation or year of birth of Doctor	3.000	0.856	40	No. of refer out	3.903	0.870
29	Age of Doctor	3.065	0.964	46	Medical Record System	3.945	0.727
30	Gender of doctor	2.516	0.890				

Potential factors of medical specialist allocation were classified into 4 levels:

- 1. National:** population structure, population health need, economic and social change, country policy, cause of death, and disease burden.
- 2. Regional:** hospital network policy, mission, strategy, and Hoshin.
- 3. Hospital:** hospital type, size, location, revenue, reputation, service offered, case mix index, bed occupancy, quality assurance, available medical technology, human resource management, and availability of doctors.
- 4. Personal:** qualification and competency, personal behavior, network contribution attitude, patient complexity, patient severity, number of admissions, number of outpatient, number of inpatient, number of surgical cases, number of refer in cases, revenue, responsibility and discipline, and benefit and welfare (Table 3).

Focused on factors with a mean value of more than 4.5 and IQR less than 1.5, 6 out of 35 were considered as the most affected potential factors of medical specialist allocation:

1. Health need of population.
2. Organization's mission.

3. Organization's Hoshin.
4. Organization's strategy.
5. Complexity of patient.
6. Severity of patient.

Discussion

This was the first survey undertaken in the largest private hospital network in Thailand to ascertain the potential factors of medical specialist allocation. The response rate of each round was more than 75%. We have modified a uniform study protocol used in previous studies. The questionnaire was modified after a series of email questions and answers using a modified Delphi technique. This process has been utilized widely in research which allows feedback and develops questions using a consensus-based approach. Therefore, all answers are based on frequency and type of response from this Delphi approach.

This study has identified 35 factors that determine the allocation of medical specialists. For factors with the mean value of more than 4.5 and IQR less than 1.5, a total of 6 factors are identified to significantly affect medical specialist

Table 3: Classification of 35 potential factors of medical specialist allocation.

National (6 factors)	Network (4 factors)	Hospital (11 factors)	Personal (Individual) (14 factors)
1. Population structure	7. Private hospital network policy	11. Case Mix Index of hospital	22. Qualification & Competency of doctor
2. Health need of population*	8. Organization's mission *	12. Services provided by hospital	23. Behaviors of doctor
3. Economic and social change	9. Organization's Hoshin *	13. The medical technology used	24. Attitude for helping Hospital Network
4. Cause of death	10. Organization's strategy *	14. Location of hospital	25. Complexity of patient *
5. Burden of disease		15. Type of hospital	26. Severity of patient *
6. Policy of country		16. Size of hospital	27. No. of OPD
		17. Revenue of hospital	28. No. of IPD
		18. Hospital's reputation	29. No. of surgical case
		19. Quality assurance of hospital	30. No. of refer in
		20. Human resource management of administrator	31. Bed occupancy rate
		21. Availability of human resources for healthcare	32. No. of Admissions
			33. Revenue of Doctor
			34. Responsibility & Discipline
			35. Benefit & Welfare

*factors that hospital executives give a high ranking to.

allocation. They include health need of the population, organization's mission, organization's Hoshin, organization's strategy, severity and complexity of patients. Regarding severity and complexity of patients, these findings are consistent with the study of Kalisch, et al.¹⁰, which reported that case mix index and a measure for acuity of patient were associated with both hours per patient day (HPPD) and nurse-reported patient workloads.¹⁵ In addition to the previous point, comparing outcomes of care by generalist and specialist, Smetana, et al.¹⁶ found that most people preferred a specialist to a generalist. Therefore, the complexity of the patient may be one of the factors for the need of a specialized doctor. Of 11 factors, for example, gender, age, the residence of physicians showed inconsistent values and are not considered as potential factors of medical specialist allocation in our study. In contrast, Wibulpolprasert S.⁷ found that gender, age, and residence are factors of medical distribution. These findings are similar to previous studies that identified gender, age, the residence of physicians, qualified staff, as a negative outcome with the inequity of medical doctor distribution or allocation.^{6, 17-20}

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Conclusion

The findings in this study could be used to plan appropriate strategies of medical specialist allocation. The questionnaire used in our study was specifically designed for the BDMS hospital network. For benchmarking purposes, the questionnaire used in our study is useful and should be adjusted for further research done in other hospital networks.

Conflict of interest statement

The authors declare no conflict of interest.

Acknowledgement

This research was funded by the Bangkok Dusit Medical Services PCL. The authors would like to cordially thank all executives who participated in our study. We also thank all experts for their valuable contribution to the research and support by Trin Charumilind MD, Prof. Prasit Wattanapa, MD, Phd. and Assos. Prof. Pradit Somprakit, MD.

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