

Factors affecting decision making of new graduate physicians in choosing potential areas of practice: A national survey

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Background : *In equitable distribution of physicians is a challenge especially in rural areas of developing countries including Thailand. The resignations of newly graduated physicians imply a failure of in comprehensive policy interventions that are not based on real and holistic understanding of the issue.*

Objective : *This study was aimed to empirically explore factors influencing decision making of newly graduated physicians in choosing future practice areas.*

Design : *Descriptive statistics and exploratory factor analysis (EFA) were used for analyzing the responses.*

Setting : *Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University*

Methods : *A national survey of 751 physicians who graduated from all 12 medical schools in Thailand was conducted in April, 2012. The questionnaire was carefully developed based on literature review and qualitative study that contained three sections: basic information of responding physicians, potential workplace and duration they intended to work, as well as opinions on issues that influence their decision making, using 5-point Likert's scale.*

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Results : *The response rate was 49.93%, almost these 60% were female with average age of 24 years old, compatible with the national profile of Thai physicians. Five factors identified included working condition (daily workload, out-of-hour duty workload and frequency, hospital size), lifestyle quality (environment, food, entertainment, cost of living), essential amenities (e.g. bank), professional development (learning opportunity, staff reputation, familiarity with staff), and adjustment concerns (distance from current residence, parents' or relatives' preference, familiarity with the area).*

Conclusion : *At least five factors that influence the decision making of newly graduated physicians in choosing areas of practice were identified. These factors are useful for the development of comprehensive interventions for alleviating inequitable distributions of physicians in developing countries.*

Keywords : *Physician, human resource allocation, exploratory factor analysis.*

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- เหตุผลของการทำวิจัย** : การศึกษาเกี่ยวกับปัจจัยที่มีผลต่อการตัดสินใจของบัณฑิตแพทย์จบใหม่ในการเลือกสถานที่ปฏิบัติงานเป็นแพทย์ใช้ทุน เพื่อเป็นส่วนหนึ่งในการแก้ปัญหาความเหลื่อมล้ำในการจัดสรรแพทย์
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- รูปแบบการวิจัย** : การศึกษาวิจัยเชิงพรรณนา และการวิเคราะห์ห้วงค์ประกอบเชิงสำรวจ
- สถานที่ทำการวิจัย** : ภาควิชาเวชศาสตร์ป้องกันและสังคม คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
- ตัวอย่างและวิธีการศึกษา** : การสำรวจระดับประเทศของบัณฑิตแพทย์จบใหม่ 751 ราย จาก 12 สถาบันผลิตแพทย์ในประเทศไทย ในการประชุมเพื่อจัดสรรแพทย์ใช้ทุน กระทรวงสาธารณสุข ปีพุทธศักราช 2555 ผู้เข้าร่วมการวิจัยทุกรายตอบแบบสอบถามด้วยตนเอง โดยแบบสอบถามพัฒนาจากการทบทวนวรรณกรรมจากบทความวิชาการที่เกี่ยวข้อง แบบทดสอบประกอบด้วย 3 ส่วนคือ 1) ข้อมูลส่วนตัวของแพทย์ 2) ปัจจัยที่มีผลต่อการตัดสินใจในการเลือกสถานที่ปฏิบัติงานเป็นแพทย์ใช้ทุน เป็นคำตอบให้เลือก 5 ระดับ และ 3) สถานที่และระยะเวลาที่ตั้งใจปฏิบัติงานเป็นแพทย์ใช้ทุน
- ผลการศึกษา** : แบบสอบถามได้รับการตอบกลับร้อยละ 49.93 ร้อยละ 60 เป็นเพศหญิง อายุเฉลี่ย 24 ปี พบว่าปัจจัยที่มีผลต่อการตัดสินใจในการเลือกสถานที่ปฏิบัติงานเป็นแพทย์ใช้ทุนได้มี 5 ปัจจัยหลักคือ 1) เงื่อนไขของการทำงาน (ภาระงาน ความถี่ของเวร และขนาดโรงพยาบาล) 2) คุณภาพชีวิต (สิ่งแวดล้อม อาหาร สิ่งบันเทิง และค่าครองชีพ) 3) ปัจจัยพื้นฐาน (เช่น ธนาคาร) 4) โอกาสในการพัฒนาตนเอง (โอกาสศึกษาต่อชื่อเสียงของแพทย์ประจำโรงพยาบาล ความคุ้นเคยกับแพทย์ประจำโรงพยาบาล) และ 5) การปรับตัว (ระยะห่างจากบ้าน ความต้องการของบิดามารดาและญาติ และความคุ้นเคยพื้นที่)
- สรุป** : 5 ปัจจัยหลักที่มีผลต่อการตัดสินใจของบัณฑิตแพทย์จบใหม่ ในการเลือกสถานที่ปฏิบัติงาน ปัจจัยเหล่านี้มีประโยชน์ต่อการจัดสรรแพทย์อย่างครอบคลุมเพื่อแก้ปัญหาความเหลื่อมล้ำในการจัดสรรแพทย์
- คำสำคัญ** : แพทย์, การจัดสรรบุคลากร, การวิเคราะห์ห้วงค์ประกอบเชิงสำรวจ.

The Thai Universal Coverage scheme has demonstrated a successful expansion of coverage and access to health care for the Thai population.⁽¹⁾ While financial mechanism has played a major role in improving the demand side, it has failed, however, to help alleviate problems on the supply side.

Equitable health care system would not be possible without effective resource allocation whereas human resource for health is a crucial factor for development of national healthcare system.⁽¹⁾ Thailand has encountered the shortage and inequitable distribution of doctors.⁽²⁾ Evidences suggested that most of the resigned physicians tried to avoid rural public hospitals. The number has increased from 61 physicians in 1999 to 352 in 2005; the majority of them were new graduates.⁽³⁾ Unfortunately, the study's attempt to investigate the reasons behind their decision making was not empirically based.

Several strategies have been implemented to promote a better distribution of physicians to the rural areas of Thailand.⁽⁴⁾ For example, since 1967, new graduate physicians have been required to sign a contract of three-year compulsory public service.⁽²⁾ A breach of the contract would result in approximately

13,000 USD fine (1 USD = 30.70 Thai baht), which is now relatively cheap with regard to the cost of six-year medical education. Another measure is to use rural recruitment, local training, and hometown placement. A third measure is special monthly allowance of 325 - 650 USD. Nonetheless, the annual resignation of at least one-third of new graduate physicians (Table 1) suggest a failure of the incomprehensive policy interventions that were not based on the real and holistic understanding of the issue.

Unlike drug or medical equipment, management and allocation of healthcare professionals is complicated not only by financial and technical factors, but also social and professional issues. For example, a Norwegian survey in 1998 found that lack of opportunities for professional development was a more common reason for leaving the remote area than wages and workload-related factors whereas enjoyable living and working conditions were the most important for staying in rural areas.⁽⁵⁾ Professional support interventions were reported as a significant contributor for the improvement of the Norwegian situation.⁽⁶⁾

Table 1. Physician Resignation in Thailand, 2005 – 2011.

| Year | Newly graduated physicians | Newly allocated physicians | Resigned physicians |
|------|----------------------------|----------------------------|---------------------|
| 2005 | 1,384 | 1,070 | 663 |
| 2006 | 1,456 | 1,089 | 777 |
| 2007 | 1,403 | 1,128 | 785 |
| 2008 | 1,261 | 1,024 | 782 |
| 2009 | 1,205 | 999 | 712 |
| 2010 | 1,732 | 1,344 | 602 |
| 2011 | 1,736 | 1,450 | 627 |

Source: Ministry of Public Health

Some common reasons identified in existing literature were usually subjective without empirical-based conceptual framework, through which healthcare professionals are viewed as active agents in dynamic systems with many competing incentives and constraints. ⁽⁷⁾ This study is, therefore, aimed to empirically explore factors influencing decision of new graduate physicians in choosing their potential areas of practice.

Methods

This exploratory mixed method of study comprised three components: questionnaire development using qualitative approaches; data collection, using a national sample of graduating physicians; and, qualitative exploratory factor analysis.

Questionnaire Development

The inputs for questionnaire development derived from three major sources (Table 2). First, a review of literature published in PubMed database was conducted using a standardized search strategy. Having familiarized ourselves with the literature, a list of key issues relevant to the topic was prepared. An article was included when at least two of the authors agreed that it was considered affecting the decision of new graduate physicians in choosing their practice areas.

Second, we analyzed the discussion threads in the web board of the student union of the Faculty of Medicine, Chulalongkorn University (<http://forum.docchula.com/>). The two key participants of the web board were the medical students who were

about to graduate and the student alumni who had work experience in various areas of practice. During the study period of January 30, 2011 to March 28, 2012, there were approximately 1,210 lines of discussion, that was read and reread until we entirely familiarized ourselves to them. We developed a set of coding scheme based on both our predefined objectives and emerged themes arose from reading the web board discussion. Line-by-line coding was then conducted manually. The themes identified were used in conjunction with the findings from literature review to produce the items in section two of the questionnaire as described below.

In the third step, a focus group interview was conducted among convenience samples of five new graduate physicians. After reading the trial version of the questionnaire, they were asked to openly discuss additional issues that influenced their decision making in choosing their potential areas of practice. Their comments were integrated to produce the final version of the questionnaire.

The questionnaire was developed and administered in Thai language; the late English version underwent forward and backward translation. It consisted of three sections: basic information of the responding physician, issues that influence his/her decision, and potential workplace and duration that s/he intended to work. In the second section, the respondents were asked if they agree with the importance of each of the 25 items, using five-point Likert scale (1, Strongly Disagree; 2, Disagree; 3, Neither Agree or Disagree; 4, Agree; and 5, Strongly Agree).

Table 2. Issues and sources of issues considered affecting the decision of new graduate physicians in choosing their practice areas.

| Issues | Literature | Webboard | Interview | Issues | Literature | Webboard | Interview |
|--|------------|----------|-----------|--|------------|----------|-----------|
| Distance between current living place and allocated area | X | X | | Hospital size | | X | X |
| Reputation and expertise of staff | | X | X | Income | X | X | X |
| Patients' characteristics in allocated area | X | | | Housing and accommodation | X | X | |
| Facilities in allocated area (e.g. bank) | | X | X | Out-of-hour duty workload | X | X | |
| Spouse's preference | X | | X | Environment in allocated area | | X | X |
| Accessibility to communication (e.g. mobile phone signal,3G) | X | X | | Cost of living in allocated area | | X | |
| Convenience of transportation | | X | X | Convenience, variety, and satisfaction of food in allocated area | | X | |
| Opportunity to learn and to train in allocated area | X | X | X | Scholarship for specialized training | X | X | X |
| Familiarity with local or senior staff | X | X | X | Parents' or relatives' preference | X | | X |
| Malpractice lawsuit situation in allocated area | | X | | Familiarity with allocated area | X | | X |

Table 2. Issues and sources of issues considered affecting the decision of new graduate physicians in choosing their practice areas. (Continued)

| Issues | Literature | Webboard | Interview | Issues | Literature | Webboard | Interview |
|--------------------------------------|------------|----------|-----------|--|------------|----------|-----------|
| Out-of-hour duty frequency | X | X | | Convenience of patient referral system | | X | X |
| Friends' preference | X | | X | Entertainment in allocated area (e.g. theater) | X | X | |
| Daily workload (during working time) | X | X | | | | | |

Data Collection

The questionnaire was distributed to 751 physicians who just graduated from 12 medical schools in Thailand and attended the national meeting for physician allocation on April 2nd, 2012. Non-respondents were defined as those who did not return the questionnaire by the end of the day.

Exploratory Factor Analysis

While responses to the Section 1 and 3 were analyzed using descriptive statistics, exploratory factor analysis (EFA) was used to analyze the responses in Section 2. EFA is a technique used to explain covariance among the observed random variables in terms of fewer unobserved random variables called factor. It helps to generate a hypothesis in such a way that the investigation of the relationships between the manifested variables and factors is not based on any prior assumptions about which manifest variables are related to which factors.⁽⁸⁾ The factor analysis was done to identify optimal number of factors, determined by Kaiser-Guttman Criterion (Number of eigenvalues > 1)⁽⁹⁾, scree test⁽¹⁰⁾, and parallel analysis.⁽¹¹⁾ We also performed

initial reliability test and item-based statistics in conjunction with EFA.⁽¹²⁾ Stata/SE Version 12 (Stata Corp.) was used for all statistical calculations.

Results

Of the 751 questionnaires distributed, 373 (49.93%) were returned and eligible for data analysis. Almost 60% (219/373) were females. The average age was 24 years old. Half of the respondents (191/373) completed their program of doctor of medicine in Bangkok Metropolitan. Almost half (179/373) listed Bangkok as their birthplace. The respondent profiles were generally compatible with the national profiles of Thai physicians.

The factor analysis suggested 3, 3 - 5, and 8 factors based on the Kaiser-Guttman Criterion, scree plot (Figure 1), and parallel analysis (Figure 2), respectively. Assuming factors could correlate, Promax rotation was used to make the EFA output more understandable. We all agreed to choose five as the optimal number of factors (Table 3). Each of the factor was named based on the issues they belonged to (Table 4).

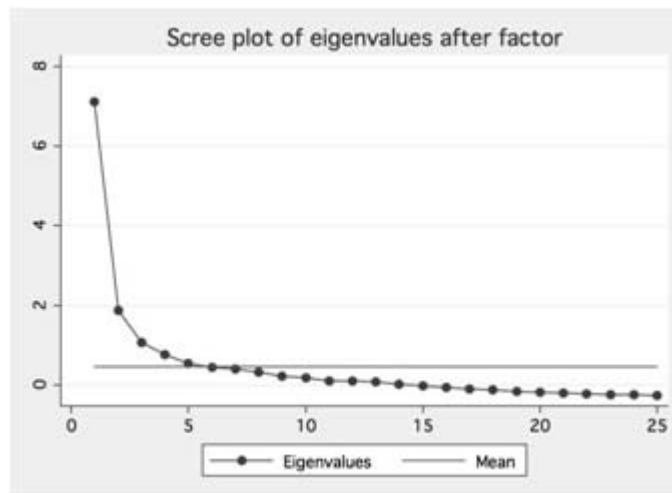


Figure 1. Scree plot.

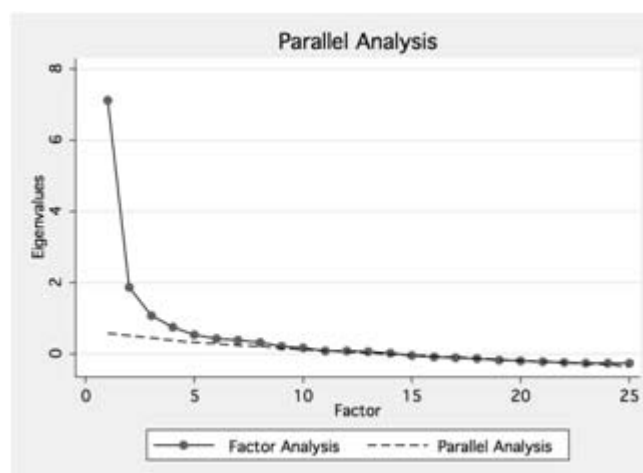


Figure 2. Parallel analysis.

Table 3. Factor loadings.

| Issues | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Uniqueness |
|--|----------|----------|----------|----------|----------|------------|
| 2.1 Distance between current living place and allocated area | -0.0953 | -0.0563 | 0.0662 | -0.0576 | 0.5478 | 0.7226 |
| 2.2 Reputation and expertise of staff | -0.0355 | 0.1983 | -0.0532 | 0.4858 | 0.0982 | 0.6455 |
| 2.3 Patients' characteristics in allocated area | 0.2225 | -0.0458 | 0.0163 | 0.3608 | 0.0150 | 0.7682 |
| 2.4 Facility in allocated area | 0.0264 | 0.3273 | 0.4529 | 0.0975 | -0.1195 | 0.5277 |

Table 3. Factor loadings. (Continued)

| Issues | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Uniqueness |
|---|----------|----------|----------|----------|----------|------------|
| 2.5 Spouse's preference | 0.0250 | -0.1321 | 0.4439 | -0.0369 | 0.0801 | 0.8163 |
| 2.6 Accessibility to communication | -0.1065 | 0.1829 | 0.6420 | 0.1032 | -0.0895 | 0.5022 |
| 2.7 Convenience of transportation | -0.1972 | 0.2407 | 0.4266 | 0.1491 | 0.0494 | 0.6423 |
| 2.8 Opportunity to learn and to train in allocated area | -0.2208 | 0.0769 | 0.0990 | 0.6290 | 0.0237 | 0.5780 |
| 2.9 Familiarity with local or senior staff | 0.1036 | -0.1164 | 0.0266 | 0.5086 | 0.2881 | 0.5286 |
| 2.10 Malpractice lawsuit situation in allocated area | 0.4121 | -0.2034 | 0.1983 | 0.3473 | 0.0490 | 0.5458 |
| 2.11 Out-of-hour duty frequency | 0.7776 | -0.0508 | 0.0960 | -0.0239 | -0.0302 | 0.3858 |
| 2.12 Friends' preference | 0.2242 | 0.0915 | 0.0404 | 0.3272 | -0.1527 | 0.7627 |
| 2.13 Daily workload | 0.8732 | 0.0433 | -0.1280 | 0.0077 | -0.0737 | 0.3039 |
| 2.14 Hospital size | 0.6506 | 0.0517 | -0.1017 | 0.0931 | 0.0427 | 0.5293 |
| 2.15 Income | 0.4346 | 0.1198 | 0.2492 | -0.2226 | 0.0320 | 0.6219 |
| 2.16 Housing and accommodation | 0.2917 | 0.3894 | 0.2222 | -0.1506 | 0.0639 | 0.4898 |
| 2.17 Out-of-hour duty workload | 0.7204 | 0.2337 | -0.0814 | -0.0956 | 0.0041 | 0.3664 |
| 2.18 Environment | 0.0975 | 0.6823 | 0.0656 | 0.0852 | -0.1213 | 0.4131 |
| 2.19 Cost of living | 0.1801 | 0.5871 | -0.0910 | -0.0349 | 0.1712 | 0.4832 |
| 2.20 Convenience, variety, and satisfaction of food | 0.0149 | 0.7962 | -0.0084 | 0.0263 | 0.0077 | 0.3397 |
| 2.21 Scholarship for specialized training | 0.0965 | 0.2416 | 0.0033 | 0.1092 | 0.3516 | 0.6316 |
| 2.22 Parents' or relatives' preference | -0.1672 | 0.0718 | -0.0499 | 0.0541 | 0.6916 | 0.5146 |
| 2.23 Familiarity with allocated area | 0.0686 | -0.0358 | -0.0703 | 0.0957 | 0.7669 | 0.3843 |
| 2.24 Convenience of patient referral system | 0.2653 | 0.0907 | 0.1493 | 0.1128 | 0.1570 | 0.6796 |
| 2.25 Entertainment in allocated area | 0.0235 | 0.5171 | 0.3312 | -0.0362 | 0.0324 | 0.4332 |

Table 4. Factors affecting the decision of new graduate physicians in choosing potential areas of practice.

| Factors | Issues |
|--------------------------|--|
| Working condition | Out-of-hour duty frequency |
| | Out-of-hour duty workload |
| | Daily workload (during working time) |
| | Hospital size |
| Lifestyle quality | Environment in allocated area |
| | Cost of living in allocated area |
| | Convenience, variety, and satisfaction of food in allocated area |
| | Entertainment in allocated area (e.g. theater) |
| Essential amenities | Facility in allocated area (e.g. bank) |
| | Accessibility to communication (e.g. mobile phone signal, 3G) |
| Professional development | Reputation and expertise of staff |
| | Opportunity to learn and to train in allocated area |
| | Familiarity with local or senior staff |
| Adjustment concerns | Distance between current living place and allocated area |
| | Parents' or relatives' preference |
| | Familiarity with allocated area |

Discussion

Evidences from our study suggests at least five factors that can influence the decision making of the new graduate physicians in choosing their areas of practice. However, this exploratory factor analysis results aim to show the significant relationships between each factors rather than probe into which is the most affect. It is interesting to see that income was not even included in any factors in our analysis, whereas factors relevant to social and professional life were more empirically prominent. This might help to explain why a number of incomprehensive strategies-mainly financial motivation - have been employed concurrently with no promising achievement. Despite increasing knowledge of non-financial

determinants of health workforce allocation such as working and housing conditions ⁽¹³⁾ as well as professional development ⁽⁶⁾; financial incentives have still been considered more often, and most of the times in isolation. Even in recent discussion on the relationship between decentralization and rural health workforce, only financial aspect was considered. ⁽¹⁴⁾

Studies on physician allocation have been conducted without empirically based conceptual framework for justified categorization of social determinants on their decision to choose areas of practice. ^(15 - 18) Moreover, determinants qualitatively identified in the literature have not always made their way to become variables for quantitative analysis. In a literature review, Dussault and Franceschini

proposed five categories of determinants that affect geographical distribution including individual factors, organizational factors, factors related to health care and educational systems, institutional structures, and socio-cultural environment.⁽¹⁹⁾ Despite the same number of categories, our study offers another way of looking at the same problem based on empirical evidence and, more importantly, from the perspective of the graduating medical students themselves. Another study on attitudes and perceptions among the Thai healthcare professionals was conducted using mixed methods approach⁽¹⁸⁾ and found some similar results; however, our study applied more robust questionnaire development, and therefore can capture more comprehensive set of issues.

Strategies for solving the imbalance of physician distribution have usually focused on compulsory public service contract with financial punishment, local recruitment, training, and placement; and special monthly allowance as mentioned above.^(4, 20) In Thailand, when the distribution problem was brought up, intensifying the compulsory contract and increasing the fines was the first 'solution' discussed whereas other less 'perceptible' concerns were left out from the development of appropriate interventions.⁽⁴⁾

The mixed methods approach that we applied allows us not only to capture many concerns localized to the Thai setting, but also to empirically synthesize a comprehensive framework; which is essential for planning comprehensive policy and/or social interventions to promote effective physicians allocation. Qualitative approach can help identify context-sensitive issues to be used for developing a better tool for quantitative data collection and analysis.

One observation from this study is that almost all investigators were key stakeholders themselves. Concerns about threat to validity of the findings are considered minimal as our goal is not to test a hypothesis but to offer an innovative approach to identify some hidden determinants that could not be revealed by studies conducted by outsiders. A limitation is that this national survey was unable to include those who went to other career pathways and did not participate in the national meeting for physician allocation. Although the response rate was less than half (49.93%), it was acceptable for data analysis and its result was compatible with the national data of Thai physicians.

Conclusion

At least five factors that can influence the decision of new graduate physicians in choosing areas of practice were proposed. These factors are beneficial for the development of comprehensive interventions for alleviating inequitable distribution of physician in developing countries.

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