



BRIEF REPORT

## REVISED Current status and problems of orthopaedic residents in Thailand and Myanmar [version 2; peer review: 2 approved]

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### Abstract

**Background:** There is no research about current experiences of orthopaedic residents in Thailand and Myanmar.

**Methods:** A questionnaire survey was distributed among Thai and Myanmar orthopaedic residents to assess their current experiences. This study included a total of 168 participants, comprising 92 orthopaedic residents in Thailand, and 76 in Myanmar who answered the questionnaire. The survey comprised nine questions about issues such as the contents of residency training programs, current training satisfaction, and future careers. The survey was administered anonymously between October 2020 and January 2021.

**Results:** Regarding training content, 24 residents (14.3%) reported being "very satisfied", 103 (61.3%) were "satisfied", 37 (22.0%) were "moderately satisfied", and four (2.4%) were "dissatisfied", and respondents spent a mean of 3.1 h/day reading textbooks and research papers. As for salary, five (3.0%) residents answered "satisfied", 46 (27.4%) responded "moderately satisfied", and 117 (69.6%) were "dissatisfied".

**Conclusions:** Many orthopedic residents in Thailand and Myanmar were enthusiastic about and satisfied with their training. Their only problem was that the salary was low.

### Keywords

orthopaedic specialists, orthopaedic residents, medical education, Thailand, Myanmar

### Open Peer Review

Approval Status

1

2

#### version 2

(revision)

16 Jun 2022

#### version 1

22 Feb 2022



[view](#)



[view](#)

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Any reports and responses or comments on the article can be found at the end of the article.

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**Author roles:** **Kasai Y:** Conceptualization, Writing – Original Draft Preparation; **Paholpak P:** Data Curation, Methodology, Writing – Review & Editing; **Wisanyotin T:** Data Curation, Investigation, Writing – Review & Editing; **Sirichativapee W:** Data Curation, Writing – Review & Editing; **Oo SK:** Data Curation, Investigation, Writing – Review & Editing; **Thu S:** Data Curation, Investigation, Writing – Review & Editing

**Competing interests:** No competing interests were disclosed.

**Grant information:** The author(s) declared that no grants were involved in supporting this work.

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**REVISED Amendments from Version 1**

For answering two reviewers' suggestions, the authors listed the percentages together with the number of residents both in the text and table. And we added some information about the residents such as their ages, gender, their resident grade and type of hospital they belonged to, and the training system in Thailand and Myanmar. Although we compared the data of Thailand and Myanmar, there were no statistically significant differences.

**Any further responses from the reviewers can be found at the end of the article**

**Introduction**

In Southeast Asian countries, most reports on medical residents becoming specialists have been reported from Singapore<sup>1-3</sup>, very few from Thailand<sup>4</sup>, and none from Myanmar. Moreover, there have been no reports on orthopaedic residents in Thailand or Myanmar in the past.

Four years of orthopaedic training are required in Thailand and Myanmar. There is each training system created by national organizations called the Royal College of Orthopedic Surgeons of Thailand in Thailand and the Myanmar Orthopaedic Society in Myanmar, and both countries provide education and clinical practice according to the training program shown annually for each-year residents. In Myanmar, the orthopedic training period was changed from 3 years to 4 years in 2018, and there is no big difference between the training systems in Thailand and Myanmar now. According to the information from the Royal College of Orthopedic Surgeons of Thailand and Myanmar Orthopaedic Society (Accessed on 4th Mar 2021), the number of orthopaedic specialists was 2,630 in Thailand and 600 in Myanmar, and the ratio of orthopaedic surgeons per 100,000 population is 4.0 in Thailand and 1.2 in Myanmar. As a reference, the number of orthopedic specialists in Japan is 19,598, which amounts to 16.3 per 100,000 population, according to the information from the Japanese Orthopaedic Association website (accessed on 20th Feb 2021). These low numbers of orthopaedic specialists in Thailand and Myanmar may be because the total number of orthopaedic residents in 2021 was limited to 138 in Thailand and 100 in Myanmar (the number of applicants changes between years.)

In the present study, we report a questionnaire survey on Thai and Myanmar orthopaedic residents investigating the actual education conditions in countries with a shortage of doctors and related problems.

**Methods**

This study included 168 orthopaedic residents, comprising 92 (18.0 % of all 520 Thai residents) of 97 orthopaedic residents from three universities and three hospitals in Thailand who answered the questionnaire and 76 (28.1% of all 271 residents in Myanmar) of 78 orthopaedic residents from one university in Myanmar who answered the questionnaire. The mean age of Thai respondents was 28.0 years (ranging 25–31 years), with 77 men and 15 women. Nine residents were married. In contrast,

Myanmar orthopaedic residents (Master of Medical Science in Orthopaedics) in this study had a mean age of 30.1 years (26–35 years), with 72 men and four women, and 26 married residents. In Thailand, 76 residents belong to university hospitals and 16 people belong to public hospitals. There are 31 first-year residents, 28 second-year residents, 24 third-year residents, and 9 fourth-year residents. In Myanmar, all of them are belonging to university-related hospitals. There are 29 first-year residents, 27 second-year residents, 20 third-year residents, and 0 fourth-year residents.

The questionnaire survey was created by the first author (YK), and the questionnaire was distributed at the end of the lecture without contacting the participants in advance to conduct this questionnaire. In Thailand, 92 out of 97 (94.8%) residents, and in Myanmar, 76 out of 78 residents (97.4%) attended the lecture. First, the doctor at the facility exposed the purpose of this questionnaire and explained that there would be no advantage or disadvantage to answering this questionnaire, and that this data would be collected, used, and published in an international journal. Then, after answering "yes" to the question asking whether participants consented to answer, all participants answered, and the questionnaire was collected. Windows 10 was used as the software tool, and the data was combined in Excel. The creator of this questionnaire did not collect data.

We conducted two types of questionnaire surveys on these orthopedic residents. One is a questionnaire about the current training, and the other is a questionnaire about hopes for overseas training and expectations for the Japanese Society of Orthopedic Surgery. The results of the latter questionnaire have already been reported<sup>5</sup>, and thus, this paper describes the results of the former questionnaire survey.

The questionnaire was administered anonymously between October 2020 and January 2021. The following nine questions were asked:

- 1) Why did you want to be an orthopaedic surgeon?
- 2) Was the selection test to be an orthopaedic resident difficult? (responses: "very difficult", "difficult", "moderately difficult", or "easy")
- 3) How long do you sleep per day?
- 4) How many hours per day do you read orthopaedic textbooks and research papers?
- 5) What is the most time-consuming task in the training program?
- 6) Are you satisfied with the training program? (responses: "very satisfied", "satisfied", "moderately satisfied", or "dissatisfied")
- 7) Are you satisfied with your salary? (responses: "very satisfied", "satisfied", "moderately satisfied", or "dissatisfied")
- 8) Do you think the orthopaedic specialist examination that you are going to take is difficult? (responses: "very difficult", "difficult", "moderately difficult", or "easy")

9) What is your career plan (or what do you want to do) after passing the orthopaedic specialist examination?

This study adhered to the ethical guidelines and regulations for research on human subjects of Khon Kaen University and was approved by the Ethics committee for human research (Approval number HE641170). Regarding the data of residents in Thailand and Myanmar, questions 3 and 4 were compared statistically using a t-test, and other questions were done by a Chi-squared test, and  $p < 0.05$  were judged to be significantly different.

**Results**

Table 1 shows the results of the questionnaire survey answered by Thai and Myanmar orthopaedic residents. As a result of comparing the data of Thailand and Myanmar, there were no statistically significant differences.

The question regarding why they became an orthopaedic surgeon was answered by “interest” by 88 residents (52.4%), “an important field of medical care” by 59 (35.1%), “easy to earn money” by 10 (6.0%), “on the advice of seniors” by six (3.6%), and “the challenge of new things” by five participants (3.0%). The selection test for orthopaedic specialists was rated as “very

difficult” by 21 residents (12.5%), “difficult” by 113 residents (67.3%), “moderately difficult” by 32 residents (19.0%), and “easy” by two residents (1.2%). Mean daily sleep was 6.0 h/day (range, 4–9 h/day), while respondents spent a mean of 3.1 h/day reading textbooks and research papers (range, 1–11 h/day). In the training programs, the most time-consuming tasks were reported to be inpatient treatment plans (including preparing presentation materials such as medical history, present illness, physical examination findings, imaging examination findings, blood test results, diagnosis and treatment schedule for preoperative meetings) and postoperative care by 83 residents (49.4%), surgery by 35 residents (20.8%), reading textbooks and research papers by 30 residents (17.9%), and physical examinations of outpatients by 20 residents (11.9%). Regarding training contents, 24 residents (14.3%) responded being “very satisfied”, 103 (61.3%) were “satisfied”, 37 (22.0%) were “moderately satisfied”, and four (2.4%) were “dissatisfied”. As for salary, five residents (3.0%) answered “satisfied”, 46 (27.4%) responded “moderately satisfied”, and 117 (69.6%) were “dissatisfied”. The difficulty of the orthopaedic specialist examination to be taken was graded as “very difficult” by 49 residents (29.2%), “difficult” by 98 (58.3%), and “moderately difficult” by 21 (12.5%); no respondents thought the examination would be “easy”. The most frequent response for a career plan after

**Table 1. Results of the questionnaire survey answered by Thai and Myanmar 168 orthopaedic residents.**

Questions	Thailand orthopaedic residents (92 persons)	Myanmar orthopaedic residents (76 persons)
1. Grounds for being an orthopaedic surgeon	interest 45 (48.9%) important field of medical care 34 (37.0%) easy to earn money 9 (9.8%) on the advice of seniors 4 (4.3%)	interest 43 (56.6%) important field of medical care 25 (32.9%) challenge of new things 5 (6.6%) on the advice of seniors 2 (2.6%) easy to earn money 1 (1.3%)
2. Selection test to be an orthopaedic surgery resident	very difficult 14 (15.2%) difficult 53 (57.6%) moderately difficult 23 (25.0%) easy 2 (2.2%)	very difficult 7 (9.2%) difficult 60 (78.9%) moderately difficult 9 (11.8%) easy 0 (0%)
3. Hours of sleep per day	average 5.7 h (4–8 h)	average 6.5 h (5–9 h)
4. Hours of study per day	average 3.5 h (1–11 h)	average 2.6 h (1–5 h)
5. Most time-consuming task in the training program	inpatient treatment plans and postoperative care 49 (53.3%) reading textbooks and research papers 18 (19.6%) surgery 15 (16.3%) physical examinations of outpatients 10 (10.9%)	inpatient treatment plans and postoperative care 34 (44.7%) surgery 20 (26.3%) reading textbooks and research papers 12 (15.8%) physical examinations of outpatients 10 (13.2%)
6. Satisfaction of the training program	very satisfied 7 (7.6%) satisfied 50 (54.3%) moderately satisfied 32 (34.8%) dissatisfied 3 (3.3%)	very satisfied 17 (22.4%) satisfied 53 (69.7%) moderately satisfied 5 (6.6%) dissatisfied 1 (1.3%)
7. Satisfaction of the salary	satisfied 4 (4.3%) moderately satisfied 37 (40.2%) dissatisfied 51 (55.4%)	satisfied 1 (1.3%) moderately satisfied 9 (11.8%) dissatisfied 66 (86.8%)
8. Orthopedic specialist examination	very difficult 24 (26.1%) difficult 52 (56.5%) moderately difficult 16 (17.4%)	very difficult 25 (32.9%) difficult 46 (60.5%) moderately difficult 5 (6.6%)
9. Future career plan	undecided 61 (66.3%) working at hospital 21 (22.8%) studying a subspecialty 10 (10.9%)	undecided 30 (39.5%) studying a subspecialty 20 (26.3%) working at hospital 16 (21.1%) undertaking training abroad 10 (13.2%)

passing the examination was “undecided” by 91 respondents (54.2%), followed by “working at a hospital” by 37 respondents (22.0%), “studying a subspecialty” by 30 respondents (17.9%), and “undertaking training abroad” by 10 respondents (6.0%).

## Discussion

Since orthopaedic diseases include many diseases from trauma to degenerative diseases, the number of patients is very large, and training of orthopedic specialists is important and indispensable in any country, training methods vary widely between countries<sup>6-9</sup>. In developing countries such as Thailand and Myanmar, trauma patients with injuries such as fractures are frequently seen, so training as a trauma surgeon is crucial<sup>10,11</sup>.

In our study results, orthopaedic residents in Thailand and Myanmar generally trained diligently and were relatively satisfied with the training content. It was speculated that the reason for applying for being orthopaedic specialists was that it was an interesting and important field of medical care, and these might be reasons they were highly motivated to learn. Although passing rates for the selection test to be accepted as orthopaedic residents differ between years and facilities i.e., universities or hospitals, the success rate for exams to become orthopaedic residents is 30–70% in Thailand and 10–30% in Myanmar, according to the information from Royal College of Orthopaedic Surgeons of Thailand and Myanmar Orthopaedic Society (Accessed on 4th Mar 2021). Because Thai and Myanmar residents are learning after successfully overcoming a competitive environment, they might have pride and a strong sense of mission to work as one of the few orthopaedic surgeons, which apparently encourages them to study hard. As a result of their hard work, around 95% of residents pass specialist examinations in Thailand and Myanmar, according to the information from the Royal College of Orthopaedic Surgeons of Thailand and the Myanmar Orthopaedic Society (Accessed on 4th Mar 2021).

On the other hand, the low salary was raised as a problem. In addition, relatively many people had not decided their future career plan, which can be attributed to about half of them being first or second-year residents. Treating fractures, dislocations

and ligament injuries is the main focus of orthopedic surgery for residents in Thailand and Myanmar, because trauma is overwhelmingly more frequent than non-traumatic diseases<sup>10,11</sup>; therefore, it was thought that one of the reasons for this was that few people would like to subspecialise in orthopaedic surgery such as joint surgery, spine surgery, and hand surgery.

The limitations of this paper are that it is the result of surveying about 20% of residents in Thailand and about 30% of residents in Myanmar, and that there were no question items about the number of years of experience of orthopaedic residents. And, one university in Myanmar, three universities in Thailand, and three hospitals chose facilities that facilitate the questionnaire survey by the authors. Universities in the largest cities in Myanmar and universities and hospitals in local cities in Thailand have been selected, and it is possible that this questionnaire survey does not accurately reflect the situation in each country. However, in the present study, we described orthopedic residents' current situation and problems in Thailand and Myanmar. As further research, we would like to increase the number of respondents and consider the differences relating to participants' years of experience as residents.

## Conclusion

Many orthopedic residents in Thailand and Myanmar were enthusiastic about and satisfied with their training. The only problem identified was that the salary was low.

## Data availability

### Underlying data

Figshare: All DATA.xlsx, <https://doi.org/10.6084/m9.figshare.19083407.v1><sup>6</sup>

### Extended data

Figshare: question for Orthopaedic residents.docx, <https://doi.org/10.6084/m9.figshare.19100036.v2><sup>7</sup>

Data are available under the terms of the Creative Commons Zero “No rights reserved” data waiver (CC0 1.0 Public domain dedication).

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# Open Peer Review

Current Peer Review Status:  

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## Version 1

Reviewer Report 12 April 2022

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### Hiroshi Ozawa

Department of Orthopaedic Surgery, Tohoku Medical and Pharmaceutical University, Sendai, Japan

In the present study, a questionnaire survey was performed for Thai and Myanmar orthopaedic residents to assess their perception of resident programs. This study included a total of 168 residents (92 in Thailand, and 76 in Myanmar). The survey included the satisfaction with training programs, salary, future careers, and so on. In the results, 24 were "very satisfied", 103 were "satisfied", and 37 were "moderately satisfied" with their training programs. Respondents spent a mean of 3.1 h/day reading textbooks and research papers. As for salary, 117 residents answered "dissatisfied". The authors concluded that many orthopedic residents in Thailand and Myanmar were enthusiastic and satisfied with their training. Their problem was the low salary.

This paper is very interesting. The first author is a Japanese orthopaedic surgeon who has been involved in orthopedics in Thailand and Myanmar for many years and is familiar with the region. As the authors state, there is a shortage of orthopaedic surgeons in Thailand and Myanmar. Many citizens are not able to have enough access to orthopaedic care. This paper showed that young physicians were eager to become orthopedic surgeons and are enthusiastic about their orthopaedic resident training. They studied for more than 3 hours daily except for hospital work.

This paper seems to be in the interests of the readership and is considered worthy of publication in the journal.

1. The reader would be better able to understand the background of Thailand and Myanmar residency systems if they were explained in the paper. For example, how many years of residency training are required in Thailand and Myanmar? How do the residents train? Is there any national training system? Are there any differences between the Thai and Myanmar training systems?
2. As for the demographics of respondents, please describe their resident grade and what type of hospital they belonged to.
3. It would be better to list the % together with the raw number.

**Is the work clearly and accurately presented and does it cite the current literature?**

Yes

**Is the study design appropriate and does the work have academic merit?**

Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**

Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**

Yes

**Have any limitations of the research been acknowledged?**

Yes

**Are all the source data underlying the results available to ensure full reproducibility?**

Yes

**Are the conclusions drawn adequately supported by the results?**

Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Spine

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

Author Response 28 Apr 2022

**Yuichi Kasai**, Khon Kaen University Faculty of Medicine, Khon Kaen, Thailand

Thank you very much for your useful comments and suggestions. The authors have answered your questions, and the additional changes and sentences in our manuscript were shown in bold.

For reviewer #2:

*The reader would be better able to understand the background of Thailand and Myanmar residency systems if they were explained in the paper. For example, how many years of residency training are required in Thailand and Myanmar? How do the residents train? Is there any national training system? Are there any differences between the Thai and Myanmar training systems?*

- **Four years of training are required in Thailand and Myanmar. Each training system was created by national organizations: the Royal College of Orthopedic Surgeons of Thailand in Thailand, and the Myanmar Orthopaedic Society in**



**Myanmar. Both countries provide education and clinical practice according to the training program shown annually for each year's residents. In Myanmar, the orthopedic training period was changed from 3 years to 4 years in 2018, and there is no big difference between the training systems in Thailand and Myanmar now. The authors added these sentences to the section of the Introduction.**

*As for the demographics of respondents, please describe their resident grade and what type of hospital they belonged to.*

- **In Thailand, 76 residents belong to university hospitals and 16 people belong to public hospitals. There are 31 first-year residents, 28 second-year residents, 24 third-year residents, and 9 fourth-year residents. In Myanmar, all of them belong to university-related hospitals. There are 29 first-year residents, 27 second-year residents, 20 third-year residents, and 0 fourth-year residents. The authors added these sentences to the section on Methods.**

*It would be better to list the % together with the raw number.*

- **Percentages display has been added to all data.**

**Competing Interests:** none

Reviewer Report 30 March 2022

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**Win Myint Oo** 

<sup>1</sup> Faculty of Medicine, SEGi University, Petaling Jaya, Malaysia

<sup>2</sup> Clinical Campus, Hospital Sibul, Sibul, Sarawak, Malaysia

Congratulations to all authors for your great work!

This cross-sectional study was conducted among orthopaedic residents in Thailand and Myanmar from October 2020 to January 2021. It was intended to explore their current situations, including their perceptions of the training programme, their future career plan and satisfaction with their salary.

Altogether 168 orthopaedic residents consisting of 92 from Thailand and 76 from Myanmar were recruited for the study. The mean age of Thai respondents was 28.0 years (ranging from 25–31 years), with 77 men and 15 women. Nine residents were married. In contrast, Myanmar orthopaedic residents (Master of Medical Science in Orthopaedics) in this study had a mean age of

30.1 years (26–35 years), with 72 men and 4 women; among Myanmar participants, 26 were married. The majority (164/168 or 97.6%) reported that they were satisfied with their training programme, while almost 70% (117/168 or 69.6%) were dissatisfied with the salary they received. The most frequent response for a career plan after passing the examination was “undecided” by 91 respondents (54.2%), followed by “working at a hospital” by 37 respondents (22.0%), “studying a subspecialty” by 30 respondents (17.9%), and “undertaking training abroad” by 10 respondents (6.0%). Almost all (98.8%) felt that the selection test for the orthopaedic residency (specialist training) programme was difficult. The average duration of sleep and reading textbooks/research papers during their current training were 6 hours/day and 3.1 hours/day, respectively. All reported that the orthopaedic specialist examination going to be taken will be difficult. In the training programs, the most time-consuming tasks were reported to be inpatient treatment plans and postoperative care. Therefore, it could be concluded that many orthopaedic residents in Thailand and Myanmar were enthusiastic about and satisfied with their training. The only problem identified was receiving a low salary.

This is an interesting, informative and useful study. There are no significant numbers of research concerning the current experiences of orthopaedic residents in South East Asian countries, especially Myanmar and Thailand. This study revealed the current situation, including the perceptions of orthopaedic residents on the training program and their future career plans. It also explored the problem they encountered or dissatisfiers with their job.

This study could relay some important feedback to health administrators or policymakers concerned in order to improve the current situation for them.

However, I would like to give the following suggestions:

1. Some findings like the mean ages and gender distribution of the respondents are described in the “Methods” section. It is better to reveal these in the “Results” section.
2. It is better to show the percentages (for each response) in Table 1 except for numbers 3 (hours of sleep per day) and 4 (hours of study per day).
3. You should discuss with your statistician whether you could use inferential statistics such as a Chi-squared test and/or t-test to check if there is/are any significant difference(s) between (residents from) Thailand and Myanmar.
4. For the findings below Table 1, it is better to reveal the percentages in parentheses. For example, regarding training contents, 24 residents (14.3%) responded as being very satisfied, 103 (61.3%), etc.
5. Check whether reference number 4 is used in this study. I don't see any in-text citation of it. Maybe my mistake.

**Is the work clearly and accurately presented and does it cite the current literature?**

Yes

**Is the study design appropriate and does the work have academic merit?**

Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**

Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**

Yes

**Have any limitations of the research been acknowledged?**

Yes

**Are all the source data underlying the results available to ensure full reproducibility?**

Yes

**Are the conclusions drawn adequately supported by the results?**

Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Infectious and non-infectious disease control, Epidemiology of CDs and NCDs, Reproductive Health, Maternal and Child Health

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

Author Response 28 Apr 2022

**Yuichi Kasai**, Khon Kaen University Faculty of Medicine, Khon Kaen, Thailand

Thank you very much for your useful comments and suggestions. The authors have answered your questions, and the additional changes and sentences in our manuscript were shown in bold.

For reviewer #1:

*Some findings like the mean ages and gender distribution of the respondents are described in the "Methods" section. It is better to reveal these in the "Results" section.*

- **Thank you very much for your comments. The authors changed the order of the sentences in the section 'Methods'.**

*It is better to show the percentages (for each response) in Table 1 except for numbers 3 (hours of sleep per day) and 4 (hours of study per day).*

- **In Table 1, the percentages were also listed together with the number of residents.**

*You should discuss with your statistician whether you could use inferential statistics such as a Chi-squared test and/or t-test to check if there is/are any significant difference(s) between (residents from) Thailand and Myanmar.*

- **Regarding the data of residents in Thailand and Myanmar, questions 3 and 4**

**were compared statistically using a t-test, and other questions were done by a Chi-squared test, and  $p < 0.05$  were judged to be significantly different. As a result of comparing the data of Thailand and Myanmar, there was no statistically significant difference. So, the authors added some sentences.**

*For the findings below Table 1, it is better to reveal the percentages in parentheses. For example, regarding training contents, 24 residents (14.3%) responded as being very satisfied, 103 (61.3%), etc.*

- **The percentages were also listed together with the number of residents in the section of 'Results'.**

*Check whether reference number 4 is used in this study. I don't see any in-text citation of it. Maybe my mistake.*

- **Reference 4 is cited in the first sentence of the Introduction: "In Southeast Asian countries, most reports on medical residents becoming specialists have been reported from Singapore<sup>1-3</sup>, very few from Thailand<sup>4</sup>, and none from Myanmar".**

***Competing Interests:*** None