

Trends in education and career choices after ophthalmology residency training in academic year 2017

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Objective: To investigate the trend toward subspecialty training among ophthalmology residents as well as factors influencing the residents' decision to train that can be used as guidelines for further education.

Method: Cross-sectional study

Results: A total of 64 residents responded to the research questionnaire. It was found that the most preferred subspecialty was retina (28.12%). The second most preferred was glaucoma (20.31%) followed by cornea and refractive surgery (17.18%) respectively. Factors and the respondents' choice of subspecialties showed that gender, age, hometown, and funding were not associated with the respondents' decision concerning subspecialty training in the future (P -value>0.05). Marital status was a factor associated with the residents' consideration of subspecialty training (P -value= 0.001). The factor that influenced most respondents in making the choice of subspecialty training was good prior knowledge in that particular subspecialty as documented (25%). The second most influential factor was the application of both medical and surgical treatment in subspecialty practice (23.72%). Most residents in this study expressed the desire to have subspecialty training after residency training.

Conclusions: The influential factors for subspecialty training was good prior knowledge in that subspecialty, which was also the main reason among the respondents preferring retina which was the most popular subspecialty in this study.

Keywords: Trend in ophthalmologist residency training, subspecialty training, motivation and factor of resident

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Introduction

Subspecialist preferences have received more attention than in the past. One of these

reasons may be due to the public, having people can greater access to information access information about diseases which they are concerned and find out which specialist doctor is best suited for them. Almost general ophthalmologists realize this, for effective treatment, training in subspecialties may be the solution for them. According to

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Kanchanaranya N et al¹ (2015), they found that ophthalmology training has been increasingly in demand and it has become one of the most popular medical specialties among general practitioners. There are 65 ophthalmologists completing residency training in Thailand each year, and this number shows increasing trends in the future so this study establishes future trends.

According to the Royal College of Ophthalmologists of Thailand, the subspecialties available for fellowship are: retina, pediatric and strabismus, oculoplastic, neuro-ophthalmology, glaucoma, low vision, ocular pathology, uveitis and ocular inflammation, and research. This study was conducted to investigate the trend toward subspecialization and subspecialty preferences among ophthalmology residents currently in training. The obtained information could be used in making decisions about subspecialty training. Moreover, the comparison of trends toward sub-specializations could provide useful information, not only to residents, but also to training institutions as they could better prepare for the residents' choice of subspecialties. This study analyzed information concerning socio-demographic including age, gender, hometown, original affiliation, and marital status as well as subspecialty preference.

Material and Methods

This is a cross-sectional descriptive study approved by the Ethics committee at Thammasat University, Thailand. Data was collected through a research questionnaire which modified from Kanchanaranya N¹ study. Paired t-test and Chi-square test were used to analyze data by Statistical Package for the Social Science (SPSS) software. The questionnaires were contributed at the

symposium organized by the Royal College of Ophthalmologists in 27-29 November 2017. The researchers of this study gave out the questionnaires themselves so that they could answer to the respondents if there was any query. The questionnaire obtained information concerning age, gender, hometown, year of residency training, the most preferred subspecialty, the reason for the choice. Only the questionnaires with complete answers for all questions were used for data analysis. The questionnaires without complete answers were excluded from this study.

This study was given out to ophthalmology residents especially focused on third-year residents as they had been in training for several years and were about to complete training. Therefore, these senior residents were more likely to have certain plans for further study, unlike residents in the first and second year of training who might not be aware of their preference yet.

Results

From the questionnaire given to first, second, and third year ophthalmology residents who attended the symposium organized by the Royal College of Ophthalmologists of Thailand in 2017, the total number of respondents was 64. Twenty-seven respondents were male (42.18%) and thirty-seven were female (57.82%). Two respondents were in the first year of training (3.12%), three were in second year (4.68%) and fifty-nine were in third year (92.18%). Fifty-seven respondents were single (89.17%) and seven were married (10.83%). The majority were in the age group 25-30 years (64.06%), followed by 30-35 years (29.69 %) and 35-40 years (6.25%). Residency training of most

respondents (59.37 %) was funded by their affiliated hospital and their hometown was mostly Bangkok (46.87%). The numbers of respondents from other regions were similar (Table 1).

The analysis of associations between various factors and the respondents' choice of subspecialties showed that gender, age, hometown, and funding were not associated with the respondents' decision concerning subspecialty

training in the future ($P\text{-value}>0.05$). In addition, these factors did not have an effect on the residents' decision to continue their study in Thailand or abroad. However, single status was a factor associated with residents' consideration of subspecialty training ($P\text{-value}$ 0.001) (Table 1). Residents who have scholarships tend to study in subspecialist (54.69%) more than those without (37.5%) but did not reach statistical significance ($P\text{-value}$ 0.97) (Table 1).

Table 1: Demographic Characteristics and future decision

		General				Study in Thai	Study abroad	P-value
		Subspecialty	Ophthalmologist	P-value	Total			
Sex	Male	25 (39.06%)	2 (3.12%)	0.86	27 (42.18%)	27	0	0.715
	Female	34 (53.14%)	3 (4.68%)		37 (57.82%)	35	2	
	Total	59 (92.18%)	5 (7.82%)		64 (100%)	62	2	
Age	25-30	37 (57.81%)	4 (6.25%)	0.55	41 (64.06%)	39	2	0.561
	30-35	18 (28.13%)	1 (1.56%)		19 (29.69%)	19	0	
	35-40	4 (6.25%)	0		4 (6.25%)	4	0	
Status	Single	54 (84.38%)	3 (4.69)	0.03	57 (89.17%)	56	1	0.001
	Married	5 (7.71%)	2 (3.12)		7 (10.83%)	6	1	
Hometown	Bangkok	5 (7.81%)	0	0.53	5 (7.81%)	5	0	0.491
	Northern	6 (9.38%)	1 (1.56%)		7 (10.93%)	7	0	
	Central	5 (7.81%)	0		5 (7.81%)	5	0	
	Southern	8 (12.5%)	1 (1.56%)		9 (14.06%)	8	1	
	Eastern	1 (1.56%)	0		1 (1.56%)	1	0	
	Western	28 (43.75%)	2 (3.12%)		30 (46.87%)	29	1	
	North-eastern	6 (9.38%)	1 (1.56%)		7 (10.93%)	7	0	
Scholarship	Yes	35 (54.69%)	3 (4.68%)	0.97	38 (59.37%)	37	1	0.355
	No	24 (37.5%)	2 (3.13%)		26 (40.63%)	25	1	

For subspecialty preferences in 2017 (Table 2), the five most preferred subspecialties were the following: retina was the top preference as a choice from 18 respondents (28.12%), followed by glaucoma from 13 respondents (20.31%), cornea and refractive surgery from 11

respondents (17.18%), the fourth in order of preference was oculoplastic chosen by 9 respondents (14.06%), the fifth was uveitis and ocular inflammation from 3 respondents (4.68%). The sixth preferred subspecialty was pediatric ophthalmology and strabismus (3.12%). Three respondents

Table 2: Number of responder considering in each subspecialties program

Subspecialties	Responder	
	Number	Percent
Retina	18	28.12
Glaucoma	13	20.31
Cornea and refractive surgery	11	17.18
Oculoplastic	9	14.06
Uveitis and ocular inflammation	3	4.68
Neuro-ophthalmology	2	3.12
Pediatric and strabismus	2	3.12
Ocular pathology	1	1.56
Low vision	1	1.56
Research	1	1.56

expressed the desire to study abroad but did not specify their preferred subspecialty.

The analysis of preferences in subspecialty training (Table 3) showed that there was one respondent (6.25%) who expressed no desire for further training in each of the following subspecialties: retina, oculoplastic, cornea and refractive surgery, and glaucoma. As for other subspecialties, the respondents expressed their intention to continue their training in the subspecialty of their choice.

Factors influencing the respondents' choice of subspecialty was analyzed from the three most preferred subspecialties. For retina subspecialty, 8.19% of the total respondents made this choice because the practice involves both medical and surgical treatment, 6.55% made the choice because of their good knowledge in the subject and the practice. For glaucoma, which was the second most preferred subspecialty, 9.83% of the respondents gave the same reason as those who chose retina - the practice involves both medical and surgical treatment. The following reason for choosing this subspecialty was because the practice

involves medical treatment (3.27%). For cornea and refractive surgery, 8.19% of the respondents reported having good knowledge in the preferred subspecialty and 3.27% reported that the preference was due to the application of both medical and surgical treatment (Table 4).

Discussion

The demand for sub-specialization among ophthalmology residents in Thailand has continuously increased as shown in their responses to the questionnaire distributed in a symposium organized by the Royal College of Ophthalmologists of Thailand. This study collected a large amount of information about the trends toward sub-specialization among ophthalmology residents. It was found that the present cohort of residents expressed a high level of interest in sub-specialization (95.32% of total respondents). This study should provide us with information to forecast and make better plans concerning sub-specialization in the future.

The three most preferred subspecialties were retina (28.12%), glaucoma (20.31%),

Table 3: Number of respondents make decision between subspecialties that consider and general ophthalmologist

Subspecialty preference	Pursuit of pre-ferred subspecialty	Intention to remain as general ophthalmologist	Total	P-value
Retina	17(94.4%)	1(5.6%)	18(100%)	0.161
Pediatric and strabismus	2(100%)	0	2(100%)	0.769
Research	1(100%)	0	1(100%)	0.676
Oculoplastic	8(88.8%)	1(11.11%)	9(100%)	0.379
Neuro-ophthalmology	2(100%)	0	2(100%)	0.054
Cornea and refractive surgery	10(90.90%)	1(9.1%)	11(100%)	0.57
Ocular pathology	1(100%)	0	1(100%)	0.769
Uveitis and ocular inflammation	3(100%)	0	3(100%)	0.092
Low vision	1(100%)	0	1(100%)	0.769
Glaucoma	12(92.03%)	1(7.97%)	13(100%)	0.263

and cornea and refractive surgery (17.81%) respectively. The results of this study were compared to the study by Kanchanaranya N et al¹ in 2015 to examine the trend toward sub-specialization, the respondents, the age group of residents entering fellowship, and the ratio between free-training fellows and those with an affiliation hospital. The study in 2015 found that 47.2% of respondents expressing interest in sub-specialization were third-year residents whereas the corresponding number increased to 92.18% in 2017. This could indicate the higher level of awareness and interest in sub-specialty training (Table 5). The average age of doctors commencing residency training was 30 years in 2015, compared to the age group 25-30 years in 2017 at 75.5% and 64.06% respectively. It is possible that general practitioners are ready to have specialty training at this age (Table 6).

The hometown of most respondents was Bangkok in both 2015 and 2017 study as documented in 48.4% and 46.8% of the total respondent, respectively. The majority of residents received training funds from affiliated hospitals, 65.8 % in 2015 and

59.37 in 2017 respectively (Table 7). This reflects the importance of educational funds as it is a factor in considering a candidate for ophthalmology training.

Retina was the most preferred subspecialty in this study as reported by 28.12% of total respondents. This subspecialty emphasizes the study of structure, function, mechanism and all diseases concerning retina. There are various types of treatment including laser therapy, eye drop, and surgery depending on the symptoms and diagnosis. The main reason for making this choice of subspecialty was the application of medical and surgical treatment in clinical practice. This finding is consistent with the study by Kanchanaranya N et al in 2015 (Table 8) which found similar reasons for making this choice as well as similar proportion of respondents (28.10%). In a study by Sivachandran N et al² which investigated the preference for subspecialty training in Canada from 1990 to 2014 among 528 ophthalmologists, it was found that the three most preferred subspecialties were 1. Retina,

Table 4: Relation between subspecialty preference and main motive for choice of preference

Subspecialties /Reason	Retina	Pediatric and strabismus	Research	Oculoplastic	Neuro-ophthal- mology	Cornea and refractive surgery	Ocular pathology	Uveitis and ocular inflammation	Low vision	Glaucoma	Total
1. Good prior knowledge	4 (6.55%)	0 (0%)	0 (0%)	3 (4.91%)	0 (0%)	5 (8.19%)	0 (0%)	2 (3.27%)	1 (6.66%)	1 (6.66%)	16
2. Medical treatment	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (6.66%)	0 (0%)	2 (3.27%)	3
3. Surgical treatment	3 (4.91%)	0 (0%)	0 (0%)	5 (8.19%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (3.27%)	10
4. Both medical and surgical	5 (8.19%)	1 (1.63%)	0 (0%)	0 (0%)	0 (0%)	3 (3.27%)	0 (0%)	0 (0%)	0 (0%)	6 (9.83%)	15
5. Job description	4 (6.55%)	1 (1.63%)	1 (1.63%)	1 (1.63%)	2 (3.27%)	2 (3.27%)	1 (1.63%)	0 (0%)	0 (0%)	1 (1.63%)	13
6. Income	1 (1.63%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1
7. Time length of study	1 (1.63%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (1.63%)	0 (0%)	0 (0%)	0 (0%)	1 (1.63%)	3
Total	18	2	1	9	2	11	1	3	1	13	61

*numbers without brackets represent the number of correspondents who selected the motive

**numbers in brackets are percentages of all correspondents (n=61)

Table 5: Compare participant between year 2015 and 2017

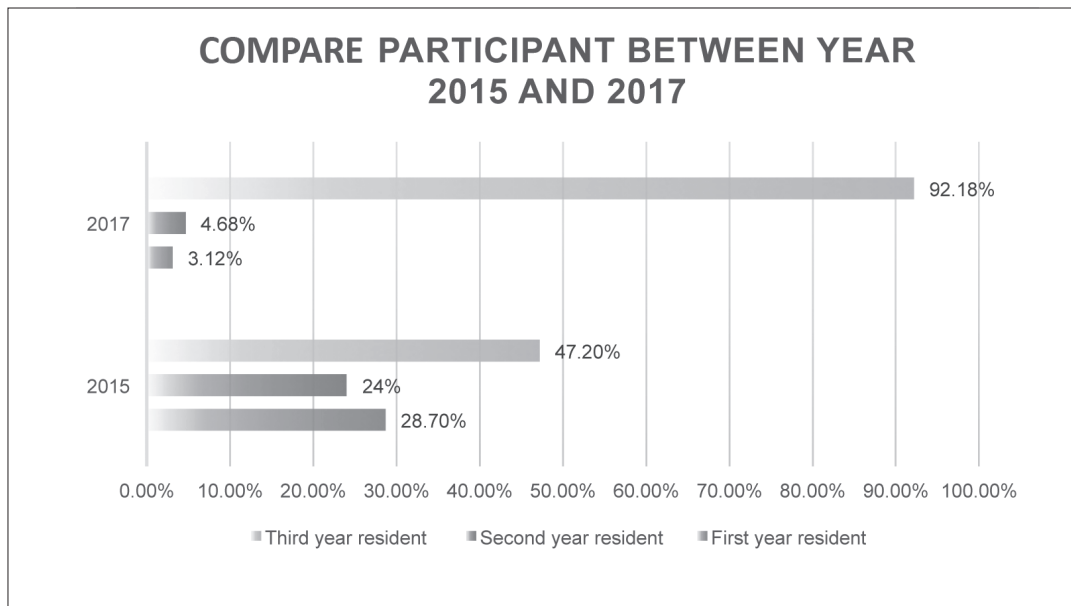
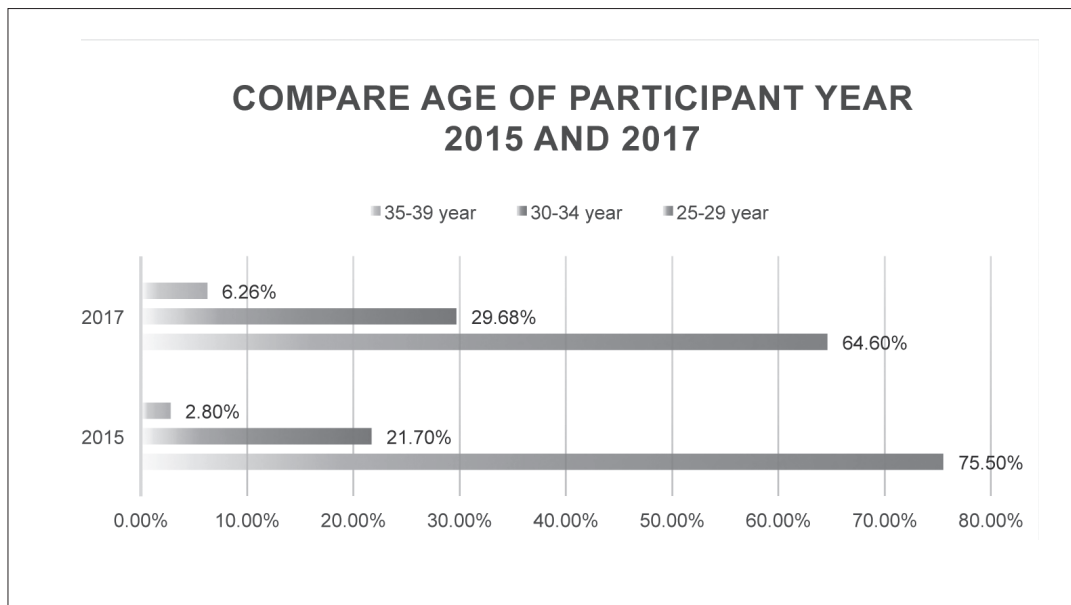


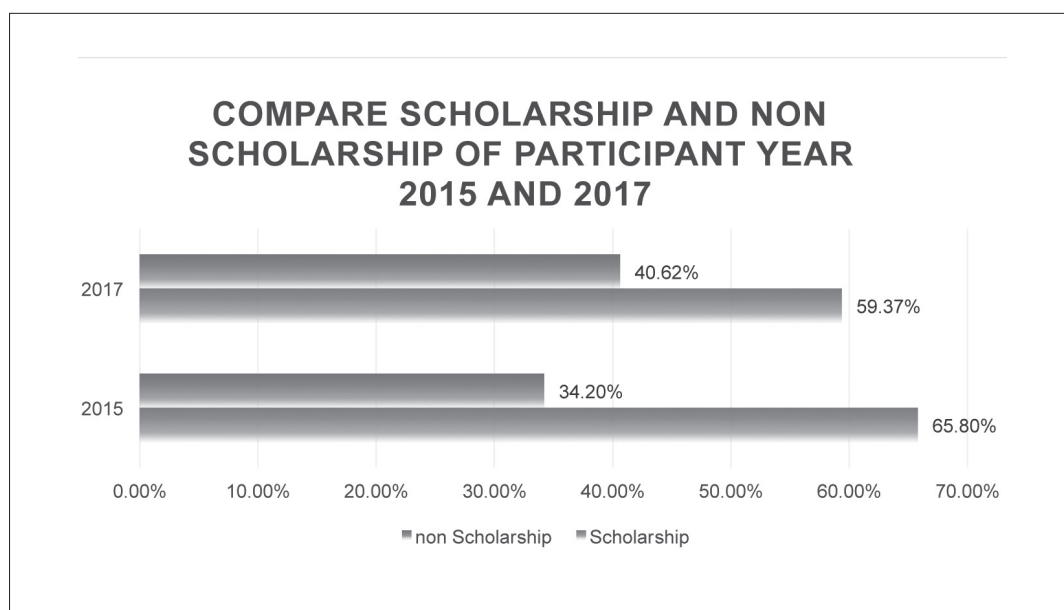
Table 6: Compare age of participant between year 2015 and 2017



2. Glaucoma, 3. cornea and refractive surgery. These findings corresponded with the result of this study. However, in a study of specialty preferences among 299 ophthalmology residents in Nigeria

conducted by Kareem O Musa et al⁷, it was found that the most preferred subspecialty was cornea and refractive surgery, followed by retina and pediatric ophthalmology and strabismus. This indicates different demand

Table 7: Compare scholarship and non-scholarship of participant between year 2015 and 2017



and preferences for sub-specialization, depending on the characteristics of the population.

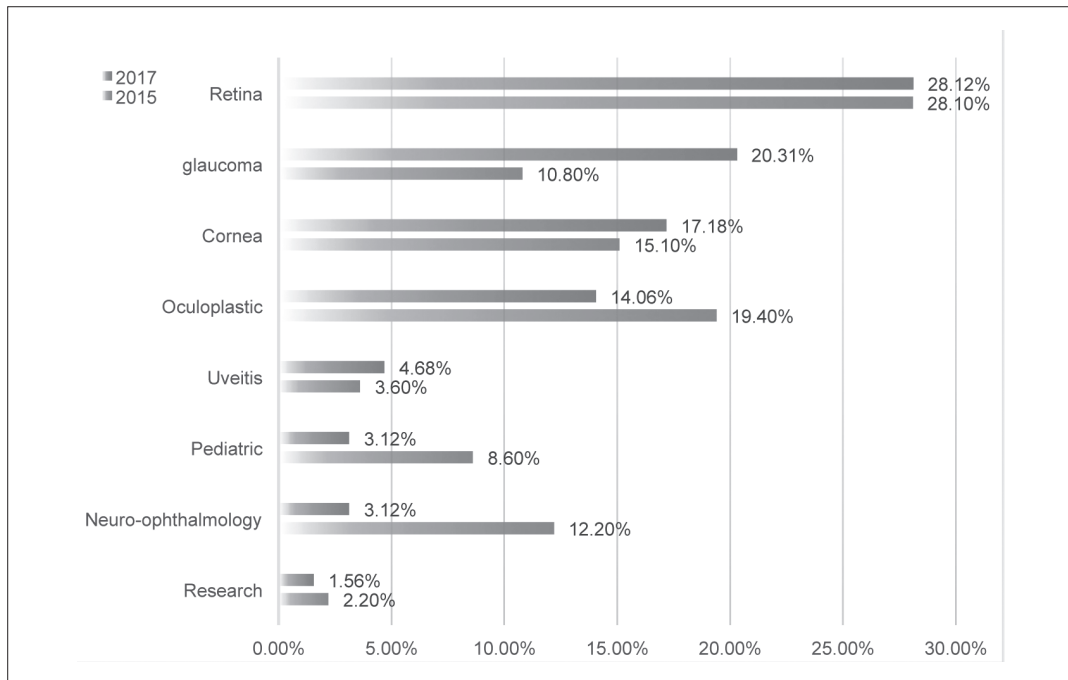
Even through retina is the most attended but the number who prefer retinal specialist and number who interests but still want just only general ophthalmologist not significant in statistic according to table 3 (P -value = 0.161) and it's also the same in other subspecialty. This may be from the number of participant wasn't much enough between two group if the higher participant, the statistic significant will show.

The second most preferred subspecialty was glaucoma, which involves various types of treatment. The reason for making this choice was the application of both medical and surgical treatment, which is the same reason as those who preferred retina. This indicates that most residents preferred the subspecialties that use both medical and surgical approach, it means the most of residents still attend the subspecialty

which can use the both of treatment. In this study 20.31% of respondents expressed preference for this subspecialty. This finding is similar to that of the study conducted by Sivachandran N et al². However, it is different from the findings of Kareem O Musa et al⁷ and Kanchanaranya N et al¹. According to Kanchanaranya N et al¹, in the year of their study the residents preferred oculoplastic. However, the preference for each subspecialty varied, depending on the subspecialty popularity at that time.

Cornea and refractive surgery was the third subspecialty in the order of preference. In this study 17.18% of respondents expressed preference for this subspecialty. The finding is consistent with the result of Kanchanaranya N et al's study¹ which also found cornea and refractive surgery the third most preferred subspecialty with 15.10% of total respondents. However, the main reason for making this choice in 2015 study was the use of medical

Table 8: Preferred specialties compared between year 2015 and 2017



and surgical treatment whereas the main reason in 2017 study was good knowledge in that subspecialty. It's indicated that even through the rank of sub specialists not change but the reason for the chosen can change with time. This result demonstrates different reasons for making choices among residents at different periods of time even though the subspecialty was in the same order of preference. The popularity of other subspecialties was at lower levels (Table 8) and it could be different each year.

This study has some limitations. For instance, the information was collected at a symposium organized by the Royal College of Ophthalmologists of Thailand on 27-29 November 2017. At this time most third-year residents made decisions about their career plan, either going back to work as a specialist or training to be subspecialists. However, first-year and second-year residents who also attended

the conference did not make certain plans about the fellowship and were likely to change their plan in the future. In addition, the study was conducted in limited time as the symposium scheduled many interesting lectures and presentations thus the respondents might complete the questionnaire in a hurry so that they can attend the lectures on time. It is possible that the interpretation of results may not reflect actual subspecialty preference. The distribution of questionnaires may not cover all subjects. Moreover, the number of respondents in this study may not sufficiently represent the preference of all residents because some questionnaires were not completely responded to, some answers were difficult to interpret, and some couldn't be used in the analysis of results.

Nevertheless, the analysis of results has shown the trend toward sub-specialization among residents. The most popular subspecialty was

retina and the main reason for this choice remained the same as previous study: the application of both medical and surgical treatment. The order of preferences for other subspecialties varied in each year due to aforementioned reasons. Moreover, the training of most residents was funded by their affiliation hospital, as they were found in a larger proportion than free-training residents. Therefore, they had to study the trend toward sub-specialization in order to plan and prepare for their fellowship training in the future.

Conclusion

Subspecialty preferences among ophthalmology residents are changeable each year due to various reasons. Nevertheless, the main reason influencing subspecialty choices was the application of both medical and surgical treatment in that subspecialty practice. The following influential factor was good knowledge in that subspecialty, which was also the main reason among the respondents preferring retina which was the most popular subspecialty in this study. Other subspecialties in lower order of preference were chosen on the basis of personal reasons.

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