Factors associated with clinical competence in the gynecologic oncology subspecialty rotation of obstetrician-gynecologist (ob-gyn) residents

By Ana Victoria V. Dy Echo, MD, FPOGS, FSGOP
Department of Obstetrics and Gynecology, Philippine General Hospital, University of the Philippines-Manila

ABSTRACT

Objective: This correlational study was conducted to determine whether factors of the Gynecologic Oncology subspecialty rotation – such as resident rotators' sex, year level, training institution, academic aptitude, duration of rotation, learning activities, case load, extent of involvement of teachers, and level of involvement of the residents – are associated with clinical competence.

Methodology: Thirty-one residents rotating in subspecialty were given MCQ examination and skills evaluation pre- and postrotation. Logbooks were completed listing all learning activities and number of cases encountered. Difference in scores was determined using paired t-test. Association of factors with clinical competence was determined using chi square and Pearson correlation coefficient.

Results: There was a statistically significant increase in the overall and skills scores, but not in the knowledge. Training institution, academic aptitude, and duration of rotation were associated with clinical competence. Conference, outpatient duty, case load, fellows as teachers and active participation were strongly associated with clinical competence. Bedside teaching, inpatient duty, and consultants as teachers were moderately associated with clinical competence. Passive participation was weakly associated with clinical competence.

Conclusion: Overall, the residents did not achieve clinical competence in Gynecologic Oncology as a result of the rotation. Residents from a training institution with a Gynecologic Oncology fellowship training program and with academic aptitude > 60% are more likely to achieve clinical competence. Increasing rotation duration to > 2 weeks, time spent in the different activities, case load, fellows and consultants interaction with residents, and active participation may increase likelihood of achieving clinical competence.

Keywords: *clinical competence, subspecialty rotation, training institution, academic aptitude, year level, duration of rotation, learning activities, case load, fellows as teachers, residents' participation*

INTRODUCTION

Obstetrics and Gynecology is a continuously expanding specialty. At present, there are at least 10 subspecialties – namely, Gynecologic Oncology, Reproductive Endocrinology and Infertility, Maternal and Fetal Medicine, Trophoblastic Diseases, Ultrasound, Infections in Obstetrics and Gynecology, Urogynecology, Family Planning, and Advanced Pelvic Surgery and Pediatric Gynecology – established in the Philippines. As frontline doctors of all obstetrical and gynecological cases, the general obstetrician-gynecologists (OB-GYN) are expected to have the clinical competence in the diagnosis and preliminary work-up of these subspecialty cases.

The residency training in Obstetrics and Gynecology in the Philippines is designed to develop an OB-GYN demonstrating competency not only in the management of general obstetrical and gynecological cases, but in the diagnosis and preliminary work-up of subspecialty cases as well. This is stated in the Philippine Obstetrical and Gynecological Society's (POGS) Council for Residents' Education, Enhancement and Development (CREED) handbook. Accordingly, third and fourth year residents are expected to have the "knowledge of basic concepts and skills in tertiary care [cases] (basic skills for diagnostic work-up, diagnostic procedures and interpretation, referral for definitive management), particularly on ambulatory care of infertility problems and menopause, ambulatory care of premalignant lesions and referral for definitive management of malignant tumors, and ambulatory care and referral for fetal surveillance and

definitive management of high risk pregnancies and recurrent pregnancy loss".[1] The POGS CREED enumerates expected roles of the general OB-GYN graduate in tertiary care, which should have been developed during training.

Rotations in subspecialty services are offered to residents with the objective of enhancing the clinical application of the theoretical knowledge regarding subspecialty topics. These rotations necessarily equip residents with adequate exposure to the subspecialty cases, making them more knowledgeable about their diagnosis and management. Through these rotations, the residents are expected to achieve clinical competence in the detection, diagnosis and preliminary work-up of subspecialty cases, recognizing indications for referral and become mediators in coordinating multisystem management.

The structure of the different subspecialty rotations, however, varies among different training institutions. For one, not all training institutions have fellowship training programs of the different subspecialties, which supposedly provides the best venue for learning about the subspecialty cases. This may suggest that not all graduates of the Obstetrics and Gynecology residency training program may have enough clinical exposure to the subspecialty cases to develop the necessary clinical competence for initial management of these cases. Other institutions would send their residents to institutions with the fellowship training programs.

Variations in the year level of rotator, duration of the rotation, and learning activities likewise exist. For example, in a Gynecologic Oncology subspecialty rotation in a University Hospital, the residents coming from the institution are third year residents who complete their rotation for 8 weeks. Resident rotators from other institutions, on the other hand, may either be third years or fourth years, and would have their rotation for only 2-4 weeks. Learning activities vary from some having both inpatient and outpatient duty exposures, others having to attend only outpatient clinics, while others would only attend the conferences.

The variations in these FACTORS – sex, year level, training institution and academic aptitude of residents, duration of rotation, learning activities, case load, extent of involvement of teachers, and level of involvement of the residents as learners – make it difficult to assess whether and how a subspecialty rotation effectively helps the residents achieve the necessary clinical competence.

It, therefore, becomes important to determine whether the factors of a subspecialty rotation mentioned above are associated with achieving the necessary clinical competence in a given subspecialty. This study, thus, was conducted to determine whether factors of a subspecialty rotation, particularly the Gynecologic Oncology rotation, are associated with the achievement of clinical competence. In the process, it also determined the adequacy of the present curriculum of the rotation, whether the existing variations in the curriculum in different institutions matter, or whether there is a need to change and standardize the curriculum in a way that will help achieve the necessary clinical competence.

OBJECTIVES

This study was conducted with the following primary objective: to determine whether the factors of the Gynecologic Oncology subspecialty rotation are associated with achieving clinical competence among OB-GYN residents.

Specific objectives include: (1) To determine if clinical competence in Gynecologic Oncology is achieved as a result of a rotation in the subspecialty, (2) To determine whether the OB-GYN residents' characteristics – such as sex, year level, training institution, academic aptitude – are associated with achieving clinical competence in Gynecologic Oncology, and (3) To determine whether factors within the rotation curriculum – duration of the rotation, learning activities, case load, extent of involvement of the consultants and fellows as teachers, and level of involvement of the residents as learners – are associated with achieving clinical competence in Gynecologic Oncology.

METHODOLOGY

This correlational study was conducted in an institution with an established fellowship training program in Gynecologic Oncology offering a subspecialty rotation to OB-GYN residents. This study was evaluated and approved by the Institution's Technical and Ethical Review Boards.

All residents, including internal residents (residents training in the institution) and external residents (residents from other institutions) rotating in the Gynecologic Oncology subspecialty from September 2017 to August 2018 were included in the study. Residents with concommitant rotation/s in other subspecialties, with concomitant duties/responsibilities in the general OB-GYN service (in-service rotation), or without informed consent were not included in the study. Once identified to fulfill the inclusion criteria, an informed consent was obtained from the residents. On the first day of their rotation, the residents were given a 50-point multiple choice question (MCQ) pretest and were evaluated as they perform a physical/pelvic examination on a cervical cancer patient. The residents were asked to write their pelvic examination findings on the patient, which was likewise evaluated for thoroughness using the Chief Fellows' examination as the standard.

All throughout the rotation, the residents immersed themselves into the activities of the subspecialty – the conferences, bedside teaching, inpatient duties and outpatient duties. During the rotation, the residents were asked to complete a logbook, listing all the learning activities they had during the rotation. The logbook included information on the date of the activity, the type of learning activity, the number of hours spent in the activity, the teacher involved in the activity (consultant vs. fellow) and the extent of their participation in the activity (active vs. passive). The residents also indicated the number and type of cases handled in each learning activity.

At the end of the rotation, the residents once again were given a 50-point MCQ posttest, and were observed on their skill in performing a physical/pelvic examination on a cervical cancer patient.

The blueprint used in creating the pretest and posttest is one and the same. The blueprint was prepared based on the expected clinical competencies of OB-GYN residents in the Gynecologic Oncology subspecialty rotation, as extrapolated from those identified by the 2 institutions offering the rotation, giving more weight on higher level learning. The mean passing level (MPL) was determined using the norm-reference system (mean score -1 standard deviation), and was identified at 25/50, or 50%. The skills checklist used was pattern after the pelvic examination checklist used for medical students. A score of 33/44 or 75% was considered passing.

Data Processing and Analysis

Descriptive statistics – means, standard deviations, frequencies, percentages – were used to analyze the residents' characteristics and rotation curriculum factors. Statistical significance in differences in the residents' test results (MCQ examination and skills checklist) before and after the rotation was determined using paired t-test. Association of the factors with clinical competence was analyzed using chi square test and Pearson correlation. In the chi square test, a p value < 0.05 is considered statistically significant. In the Pearson correlation, following the guidelines by Evans (1996), an r value of 0.00-0.019 shows a very weak correlation, a value of 0.20-0.39 shows a weak correlation, a value of 0.40-0.59 shows a moderate correlation, a value of 0.60-0.79 shows a strong correlation, and a value of 0.80-1.00 shows a very strong correlation.

RESULTS

Description of the Factors

A total of 31 residents participated in the study. Table 1 shows the demographic profile of the residents. All residents are female (100%). Nine (29%) are internal residents, while 22 (71%) are external residents. Twenty two (71%) are third year residents, while 9 (29%) are fourth year residents. In terms of academic aptitude, 15 (48%) obtained a percentage grade of < 60% in their most recent POGS in-service examination, while 16 (52%) obtained a percentage grade > 60%.

Twenty one (68%) residents had a 2-week rotation, 1 resident had a 4-week rotation, and 9 residents had an 8-week rotation. During the rotation, the residents spent the most number of hours in outpatient duty (67.19 + 44.0 hours). This was followed by in-patient duty (24.94 + 39.2 hours), conference (12.00 + 11.1 hours), and bedside teaching (5.65 + 9.4 hours). The mean number of cases seen by a resident was 20.07 + 17.3. The most common cases seen were cervical cancers (10.09 + 8.2 cases), followed by endometrial cancers (5.29 + 5.1 cases), ovarian/fallopian tube cancers (4.16 + 4.4 cases) and vulvar/vaginal cancers (0.52 + 1.1 cases (Table 2).

The average number of hours spent with the consultant was 15.58 + 15.3 hours, while the average number of hours spent with the fellow was 94.32 + 88.2 hours. The residents had active participation in the learning activities for 91.77 + 94.2 hours, and had passive participation in the learning activities for 17.94 + 18.9 hours (Table 2).

Measures of Clinical Competence

With regards to improvement of knowledge and skills as a result of the rotation, there was a statistically significant increase in the residents' overall grades as a result of the rotation (p=0.001). Broken down into its components, a statistically significant increase in grades was noted in skills (p=0.025) but not in knowledge (p=0.41) (Table 3).

With regards achieving a passing score as a measure of clinical competence, in the pretest evaluation, 7 residents (23%) are within acceptable clinical competency level, while 24 (77%) are below acceptable clinical competency level. In the posttest evaluation, 12 residents (39%) are within acceptable clinical competency level, while 19 residents (61%) are below acceptable clinical competency level (Table 4).

Association of Factors with Clinical Competence

Among the residents' characteristics, the training institution of the residents (internal residents, p=0.000) and the academic aptitude (grade > 60%, p=0.009) were noted to be associated with clinical competence in Gynecologic Oncology (Table 5).

As for the rotation curriculum factors, the duration of the rotation (> 2 weeks, p=0.001) was noted to be associated with clinical competence in Gynecologic Oncology (Table 5). Conference (r=0.661), outpatient duty (r=0.679), case load (r=0.615), having fellows as teachers (r=0.665), and active participation of the residents

Table 1. Resident Characteristics

CHARACTERISTIC	FREQUENCY (N = 31)	PERCENTAGE
Gender		
Female	31	100%
Male	0	0
Training Institution		
Internal residents	9	29%
External residents	22	71%
Residency Year Level		
III	22	71%
IV	9	29%
Academic Aptitude		
< 60%	15	48%
> 60%	16	52%

Table 2. Rotation Curriculum

FACTORS	FREQUENCY / MEAN	PERCENTAGE/ STANDARD DEVIATION
Duration of Rotation (frequency, %)		
2 weeks	21	68%
4 weeks	1	3%
8 weeks	9	29%
Learning Activities (mean hours, SD)		
Conference	12.00	+ 11.3
Bedside Teaching	5.65	+ 9.6
In-patient Duty	24.94	+ 39.9
Outpatient Duty	67.19	+ 44.7
Case Load (mean number, SD)		
Cervical	10.10	+ 8.3
Endometrial	5.29	+ 5.2
Ovarian/Fallopian Tube	4.16	+ 4.5
Vulvar/Vaginal	0.52	+ 1.1
TOTAL Case Load	20.07	+ 17.3
Type of Teacher (mean hours, SD)		
Consultant	15.58	+ 15.5
Fellow-in-Training	94.32	+ 89.6
Residents' Participation (mean hours, SD)		
Active	91.77	+ 95.7
Passive	17.94	+ 19.2

Table 3. Clinical Competence as Improvement in Scores

INSTITUTION	PRETEST	POSTTEST	*t*	P value
Overall	52.71 (+ 6.87)	56.71 (+ 6.66)	-3.838	**0.001**
Knowledge	23.68 (+ 6.48)	25.77 (+ 5.87)	-2.133	0.41
Skills	29.03 (+ 4.87)	30.94 (+ 3.97)	-2.352	**0.025**

Table 4. Clinical Competence as Achieving Passing Score

	Within Acceptable Competency Level	Below Acceptable Competency Level
Prerotation	7 (23%)	24 (77%)
Postrotation	12 (39%)	19 (61%)

Table 5. Association of Factors with Clinical Competence (Using Chi Square)

	PREROTATION		POSTROTATION	
	Within Acceptable Competency Level	**Below Acceptable Competency Level**	**Within Acceptable Competency Level**	**Below Acceptable Competency Level**
Institution				
Internal	5 (55.6%)	4 (44.4%)	8 (88.9%)	1 (11.1%)
External	2 (9.1%)	20 (90.9%)	4 (18.2%)	18 (81.8%)
p value		**0.012**		**0.000**
Year Level				
III	6 (27.3%)	16 (72.7%)	10 (45.5%)	12 (54.5%)
IV	1 (11.1%	8 (88.9%)	2 (22.2%)	7 (77.8%)
p value		0.639		0.418
Academic Aptitude				
< 60%	1 (6.7%)	14 (93.3%)	2 (13.3%)	13 (86.7%)
> 60%	6 (37.5%)	10 (62.5%)	10 (62.5%)	6 (37.5%)
p value		0.083		**0.009**
Duration of Rotation				
2 weeks	2 (9.5%)	19 (90.5%)	4 (19.0%)	17 (81.0%)
> 2 weeks	5 (50.0%)	5 (50.0%)	8 (80.0%)	2 (20.0%)
p value		**0.011**		**0.001**

Table 6. Association of Factors with Clinical Competence (Using Pearson's Correlation Coefficient)

	Pearson Correlation
Learning Activities (hours)	
Conference	0.661
Bedside Teaching	0.591
In-patient Duty	0.599
Outpatient Duty	0.679
Case Load (number)	
Cervical	0.630
Endometrial	0.627
Ovarian/Fallopian Tube	0.433
Vulva/Vagina	0.377
TOTAL	0.615
Type of Teacher (hours)	
Consultant	0.487
Fellow	0.665
Residents' Participation (hours)	
Active	0.652
Passive	0.261

(r=0.652) were strongly associated with clinical competence. Bedside teaching (r=0.591), inpatient duty (r=0.599), and having consultants as teachers (r=0.487) were moderately associated with clinical competence. Passive participation of the residents (r=0.261) was weakly associated with clinical competence (Table 6).

The year level of the resident was not associated with clinical competence in Gynecologic Oncology. With regards sex, it was not possible to determine its association with clinical competence as all residents in the study were female.

DISCUSSION

As stated in the POGS CREED handbook1, residents are expected to have the basic knowledge and skills in the diagnosis, preliminary work-up and management of gynecologic cancers as part of their core competencies. Ideally, a rotation in Gynecologic Oncology during residency would result in the acquisition of clinical competence in the subspecialty. In the present study, the measures of clinical competence were a passing score in the MCQ examination and skills evaluation, and a statistically significant increase in the grades from the pretest to the posttest.

In this study, a statistically significant increase in the overall mean score of the residents was observed (p=0.001), with significant improvement in the skills mean score (p=0.025). However, in terms of achieving a passing score, although the residents achieved a mean score of 25.77 in knowledge in the posttest (passing score is 25), the skills mean score as well as the overall mean score were still below the passing score in the posttest (passing score is 33 for skills, and 58 for overall). These results suggest that the residents did not achieve clinical competence as a result of a rotation in Gynecologic Oncology. A similar outcome was observed in the study of Shanmugam, et al, where the residents' scores in the Internal Medicine board examination did not improve with exposure to subspecialty rotations.[2] There are 2 possible explanations for this finding. First, the small sample size in the study may not have been enough to demonstrate a statistically significant increase in the mean scores and a demonstrable achievement of a passing score. Second, and probably more importantly, looking at the factors of the rotation curriculum, there was a wide variation in the mean hours spent in the different learning activities, spent with the consultants and fellows, and spent in active and passive participation, as well as in the mean number of case load – all demonstrated by the wide standard deviation. This suggests that the manner by which a subspecialty rotation is conducted may have an impact on the achievement of clinical competence.

Clinical competence in Gynecologic Oncology as a result of the subspecialty rotation was noted to be associated with different factors. In this study, training institution, academic aptitude of the residents, duration of the rotation, learning activities, case load, extent of involvement of the consultants and fellows as teachers, and level of participation of the residents were noted to be associated with clinical competence.

The institution of the residents, particularly being an internal resident, was associated with clinical competence in Gynecologic Oncology. The presence of a Gynecologic Oncology fellowship training program in the institution may be responsible for this finding. With a Gynecologic Oncology fellowship training program, the residents in the institution are generally exposed to the subspecialty cases for most part of their residency training. Even if the residents have a dedicated rotation in Gynecologic Oncology, their acquisition of clinical competence may not be limited to the period of their rotation, as the residents frequently encounter these subspecialty cases at the emergency room and outpatient clinic even during their in-service rotation, and are able to co-manage a considerable number of cases with the subspecialty. This positive effect of having a fellowship training program in an institution to residency training was also demonstrated in other studies. In the study of McBain, et al., having a forensic fellowship training program resulted in higher forensic subscale scores in the Psychiatry resident in-service examination.[3] In the study of Adhikari, et al., Emergency Medicine residents in institutions with Emergency Ultrasound fellowship training program were able to perform more bedside ultrasounds and were exposed to more advanced applications of the procedure.[4]

An academic aptitude grade > 60% was noted to be associated with clinical competence in Gynecologic Oncology. This is an expected finding as aptitude has always been shown to be associated with academic performance. Al-Alwan assessed aptitude examination results and subsequent academic performance in college, and noted a good correlation between the two.[5] Tan, et al. further noted that with every increase in aptitude, a corresponding increase in academic performance was demonstrated.[6]

This study has shown that the duration of the rotation is associated with clinical competence, particularly suggesting that a 2-week rotation may not be enough for the residents to achieve clinical competence in Gynecologic Oncology. This finding complements the findings that an increased number of hours spent in the different learning activities and increased case load are also associated with clinical competence. In contrast, the studies of Lussiez, et al. and Hellman, et al. demonstrated the lack of significant association between duration of rotation and residents' clinical competence, and instead, noted that increasing the learning activities in a given time offsets the impact of duration of rotation.[7,8] In the Gynecologic Oncology subspecialty rotation, however, the learning activities are set at specific days of the week, thus it becomes necessary for the resident to rotate in the subspecialty for more weeks in order to spend more time in the different learning activities, acquire a higher case load, and subsequently achieve clinical competence.

Among the different learning activities, the conference and outpatient duty were shown to have a strong association with clinical competence, while bedside teaching and in-patient duty were shown to have a moderate association with clinical competence. The conference and bedside teaching, which are didactic in nature, are good venues for enhancing residents' clinical competence. Didactics is frequently identified in literature as an activity that maximizes residents' learning. In the study of Steiner, et al., 3 hours of didactics per week was associated with improved knowledge[9], while in the study of Adhikari, et al., the residents recognized the need for increased didactic hours to maximize resident education.[4] The conferences in Gynecologic Oncology provide the best opportunity for consultant-resident interaction as cases both admitted in the institution and seen in the outpatient

clinic are discussed. The bedside teaching, on the other hand, provides opportunity for fellow-resident interaction as cases admitted in the institution are discussed.

As in the present study, different studies have demonstrated a positive association between outpatient clinic exposure and clinical competence. Duke, et al. observed that Family Medicine residents who rotated in the pediatric ambulatory clinic had significant increase in knowledge scores compared to those who only had in-patient duties.[10] In the study of Hellman, et al., a 3-week ambulatory care subspecialty rotation resulted in improvement of their rheumatology knowledge test scores and mean bone radiographic interpretation scores.[8] As a large proportion of gynecologic cancer care occur in the outpatient duty, increasing exposure to this learning activity is necessary. In the outpatient duty, the residents may have a grasp of the complete course of treatment of gynecologic cancer patients – as they see patients from initial consult or referral to the subspecialty, to outpatient treatment, and to eventual posttreatment follow-up. The residents are also able to directly handle patients allowing them to improve their skills on history taking, physical examination and counseling of gynecologic cancer patients.

Although most studies observed a decreasing importance of inpatient duty[8-10], the present study demonstrated a moderate association with clinical competence. Inpatient duty supplements the learnings of the residents in the conferences and outpatient duties. The residents are given the opportunity to observe in the surgical management of gynecologic cancers discussed in the conference, and are able to actively participate in the management of complications associated with gynecologic cancers. The inpatient duty also provided the residents the opportunity for continuity of care of patients initially seen at the outpatient clinic.

Case load was found to be strongly associated with clinical competence, suggesting that an increase in case load means having more cases to learn from. However, based on the study of Shanmugam, et al., high case load does not always translate to more learning. In the said study, the increase in case load in Cardiology rotation resulted in poor residents' in-service examination. This was mainly because the rotation was primarily service-oriented, with fewer attending-resident interaction.[2] This emphasizes that more than a mere increase in case load, adequate discussion of the cases encountered is important in improving knowledge.[11]

Fellows as teachers was strongly associated with clinical competence, while consultants as teachers was moderately associated with clinical competence. Although consultants provide the best expertise in the subspecialty, and are in fact the best individuals to teach the residents, they may not always be physically present in the clinical experiences of the residents. In such instances, the fellows become the primary teachers. In the Gynecologic Oncology rotation, the fellows are the primary teachers in majority of the learning activities (bedside teaching, inpatient duty, outpatient duty). Although the fellows seemingly have limited expertise, the study of Backes, et al. demonstrated how fellows can be complementary to the consultants as teachers. With fellows assumed to be primarily teaching the basic concepts in the subspecialty, the consultants are able to focus on teaching advanced topics.[12]

Active participation of the residents was strongly associated with clinical competence, while passive participation was weakly associated with clinical competence. No literature evaluated the effect of extent of residents' participation in the learning activities to clinical competence. The results in this study, however, suggests the importance of maximizing active participation of the residents in the learning activities, as passive participation, or mere observation, may not result in increased knowledge and/or skills.

Year level was noted to be not associated with clinical competence. This is expected as clinical competence in Gynecologic Oncology should be achieved by the third year of residency, such that clinical competence of a third and fourth year may not be significantly different. The results may be different if younger residents – first or second year residents – rotated in Gynecologic Oncology, as that observed in the study of Steiner, et al. First year residents who rotated in Reproductive Endocrinology and Infertility had perceived poor knowledge in the subspecialty even after the rotation and felt that they needed longer time in the rotation to achieve clinical competence in the subspecialty.[9]

SUMMARY, CONCLUSION AND RECOMMENDATION

SUMMARY

In this study, residents did not achieve clinical competence in Gynecologic Oncology as a result of the subspecialty rotation. Although there was a statistically significant improvement in overall mean scores, the mean overall posttest scores did not reach the passing level. This failure to achieve clinical competence may be due to wide variations in the factors of the subspecialty rotation.

Coming from an institution with a Gynecologic Oncology fellowship training program, having an academic aptitude grade > 60%, and a rotation of > 2 weeks are associated with clinical competence. Conference and outpatient duty, case load, having fellows as teachers, and active participation of the residents are strongly associated with clinical competence. Bedside teaching and inpatient

duty, and having consultants as teachers are moderately associated with clinical competence. Passive participation is weakly associated with clinical competence.

CONCLUSION

Different factors are associated with the acquisition of clinical competence in Gynecologic Oncology. Although certain inherent characteristics of the residents (such as training in an institution with a Gynecologic Oncology fellowship training program and academic aptitude grade > 60%) are associated with the acquisition of clinical competence, factors in the rotation curriculum are also important in achieving clinical competence. A rotation of > 2 weeks, ensuring increased time spent in the different learning activities, increased case load, consultants-residents and fellows-residents interactions, and active participation of the residents increase the likelihood of achieving clinical competence in the Gynecologic Oncology.

RECOMMENDATION

The results of this study suggest that with the present curriculum of the Gynecologic Oncology subspecialty rotation, the residents do not achieve clinical competence in the subspecialty. It is thus necessary to evaluate the present rotation curriculum, and standardize the rotation by increasing duration of the rotation to > 2 weeks, increase exposure to all learning activities, increase case load, increase teacher-student interaction and encourage active participation of the residents to facilitate achievement of clinical competence in the subspecialty.

ACKNOWLEDGEMENT

This study was given a research grant by the Philippine Obstetrical and Gynecological Society, Inc. (POGS).

This study was completed in partial fulfillment of the requirements of the degree of Master of Health Professions Education. Acknowledgement is given to the following for their contribution in the completion of this paper: Dr. Nemuel S. Fajutagana as my thesis adviser; Asst. Prof. Maria Elizabeth M. Grageda, Dr. Melflor A. Atienza, Dr. Stella Marie L. Jose and Dr. Jean Anne B. Toral as my panelists; Dr. Jericho Thaddeus P. Luna for helping me conceptualize my thesis topic; Dr. Shiela Marie S. Lavina as my statistician; and Mr. Mark Edwin A. Bentinganan as my research assistant. ■

REFERENCES

1. Philippine Obstetrical and Gynecological Society, Inc. (POGS). POGS Council for Residents' Education, Enhancement and Development (CREED) Manual. Manila. 2014.

2. Shanmugam VK, Tsagaris K, Schilling A, McNish S, Desale S, et al. Impact of subspecialty elective exposures on outcomes on the American board of internal medicine certification examination. *BMC Medical Education.* 2012; 12:94.

3. McBain SM, Hinton JA, Thrush CR, William DK, Guise JB. The effect of a forensic fellowship program on general psychiatry residents' in-training examination outcomes. *Journal of American Academic Psychiatry Law.* 2010; 38:22-38.

4. Adhikari S, Raio C, Morrison D, Tsung J, Leech S, et al. Do emergency ultrasound fellowship programs impact emergency medicine residents' ultrasound education? *Journal of Ultrasound in Medicine.* 2014; 33:999-1004.

5. Al-Alwan IA. Association between scores in high school, aptitude and achievement exams and early performance in health science college. *Saudi Journal of Kidney Diseases and Transplantation*. 2009; 20(3):448-53.

6. Tan DA, Balasico CL. Students' academic performance, aptitude and occupational interest in the National Career Assessment Examination. *PUPIL: International Journal of Teaching, Education and Learning.* 2018; 2(3):01-21.

7. Lussiez A, Bevins J, Plaska A, Rosin V, et al. General surgery resident satisfaction on cardiothoracic rotations. *Journal of Surgical Education.* 2015; 73(1):95.

8. Hellman DB, Flynn JA. New ways to teach general internal medicine – the role of ambulatory subspecialty rotations. *Transactions of the American Clinical and Climatological Association*. 1997; 108:259-270.

9. Steiner AZ, Fritz M, Sites CK, Coutifaris C, Carr BR, et al. Resident experience on reproductive endocrinology and infertility rotations and perceived knowledge. *Obstetrics and Gynecology*. 2011; 117:324-30.

10. Duke P, Curran V, Hollett A. Training family medicine residents to care for children. What is the best approach? *Canadian Family Physician.* 2011; 57:e46-50.

11. Zuhairah ARA, Al-Dawood KM, Khamis AH. Factors affecting Family Medicine residents' perception of achievement of training objectives. *Journal of Health Specialties*. 2014; 2(3):114-122.

12. Backes CH, Reber KM, Trittmann JKB, Huang H, Tomblin J, et al. Fellows as teachers: a model to enhance pediatric resident education. *Medical Education Online*. 2011; 16:7205.