Photo Challenge: an educational innovation to stimulate effective learning in ophthalmology

Sakchai Vongkittirux[1], Takakorn Kupakanjana[1], Picha Thunpimon[1]

[1]Department of ophthalmology, Thammasat University, Thailand

Background: The learning process in Ophthalmology emphasizes visual disease manifestations, which can be traced to aspects such as epidemiology, pathophysiology, clinical manifestations and management. However, contemporary teaching methods of lecturing are often insufficient for facilitating learning. Additionally, instructors find it difficult to evaluate the knowledge and understanding of students after lectures.

Method: Fifteen residents from three years of training were randomized and divided into five groups to compete in a quiz and discuss different aspects of the disease depicted in the photo. Qualified ophthalmologist instructors score the team's performance on quality and completion of discussion and provide feedback on the conformity, rationale and omissions of the discussion as a team.

Result: Ophthalmology residents participating in Photo Challenges favored the activity and benefited from engaging in the learning experiences as well as being given opportunities to practice clinical thinking processes by verbally approaching the clinical diagnosis from important findings and management of the disease. Instructors are able to assess their students' degree of success in learning outcomes and provide instant feedback.

Conclusion: Photo Challenge is an educational innovation is suitable for Ophthalmology learning and is effective for students to achieve learning outcomes as well as gain straightforward assessment from instructors. This teaching method can also be applicable to other studies where photographs are an important element in the learning process.

Keyword: Photo Challenge, medical education, educational innovation

Conflicts of interest: The authors report no conflicts of interest.

EyeSEA 2019;14(2):105-109

DOI: https://doi.org/10.36281/2019020301

Introduction

The learning process in Ophthalmology emphasizes visual disease manifestations, which can be traced to aspects such as epidemiology, pathophysiology, clinical manifestations and management. Clinical Images are considered to be efficient tools in medical education and enhance clinical diagnosis skills.[1,2] It has also been published that tests promote better retention of information and feedback is crucial to learning from tests.[3] However, contemporary teaching methods of lecturing are often insufficient for facilitating learning.[4] Additionally, instructors find it difficult to evaluate the knowledge and understanding of students after lectures.

Photo Challenge is an activity developed by authors in order to stimulate effective learning, Ophthalmology residents from the Faculty of Medicine, Thammasat

Correspondence to:
Sakchai Vongkittirux, Thammasat University
E-mail: vosakchai@gmail.com
Received : 15th August 2019
Accepted: 30th August 2019
Published: 10th November 2019

University. The activity engages both residents and instructors in the learning and teaching process. All the photos were pre-selected and, during the challenge, guided to the correct answers and important details by qualified and experienced ophthalmology specialists.

Methods

Photo Challenge is a set of five ophthalmic photos and their related investigations creating by 7 ophthalmologists in 5 sub specialties. A list of common ophthalmic diseases is referred to American Academy of Ophthalmology textbook.(Table 1)

In this study, fifteen residents from three years of training were tested by pre and post Objective Structured Clinical Examination (OSCE) for objective evaluation. For subjective evaluation, a pre-post questionnaire was used.(Table 2)

All residents were randomized and divided into five groups to compete in a quiz and discuss the disease depicted. There will be only one photo for each group. The 1st year trainee will start first, then second and third year residents will have to add up what has not been previously described or discussed respectively. Later, qualified ophthalmologist instructors will score the team's performance on quality and completion of discussion and provide feedback on the conformity, rationale and omissions of the discussion as a team. This Photo Challenge was performed twice a month for 3 months. All residents attend all Photo Challenge activities. Then, all attendees were both subjectively and objectively tested after the activity finished. (Figure 1) Photo Challenge activity uses open question and let the competitors freely "describe everything you know" and discuss different aspects of the disease depicted in the photo as following topics : History taking, Physical examination, Investigation, Differential

Table 1: A list of common ophthalmic diseases in all Photo Challenge set

List of ophthalmic diseases in Photo Challenge activity	
Neovascular glaucoma	Vitreomacular traction
Trabeculoplasty	Fush heterochomic uveitis
Peters' anomaly	Glaucomatocyclitic crisis
Vogt-Koyanagi-Harada Disease	Thyroid eye disease
slow progressive myopia	Endophthalmitis
Krukenberg spindle	blepharophimosis syndrome
Aniridia	Nocardia keratitis
Pseudoexfoliation syndrome	Band keratopathy
Vortex keratopathy	Adrenochrome deposits
Keratoconus	Meesmann corneal dystrophy
Coloboma	Pseudoesotropia
Mobius syndrome	Orbital cellulitis
Epiblepharon	Epicanthus
Pilomatricoma	Congenital nevocellular nevus
Trichotillomania	Diabetic macular edema

Table 2 : Pre-questionnaire for subjective evaluation.

Pre-questionnaire: Circle appropriate level of your knowledge about the following topics															
	Glaucoma			Cornea			Retina			Pediatrics			Oculoplastic		
History taking	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
Physical examination	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
Investigation	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
Differential Diagnosis	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
Treatment	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
Prognosis	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H

*L = low, M = moderate, H = high

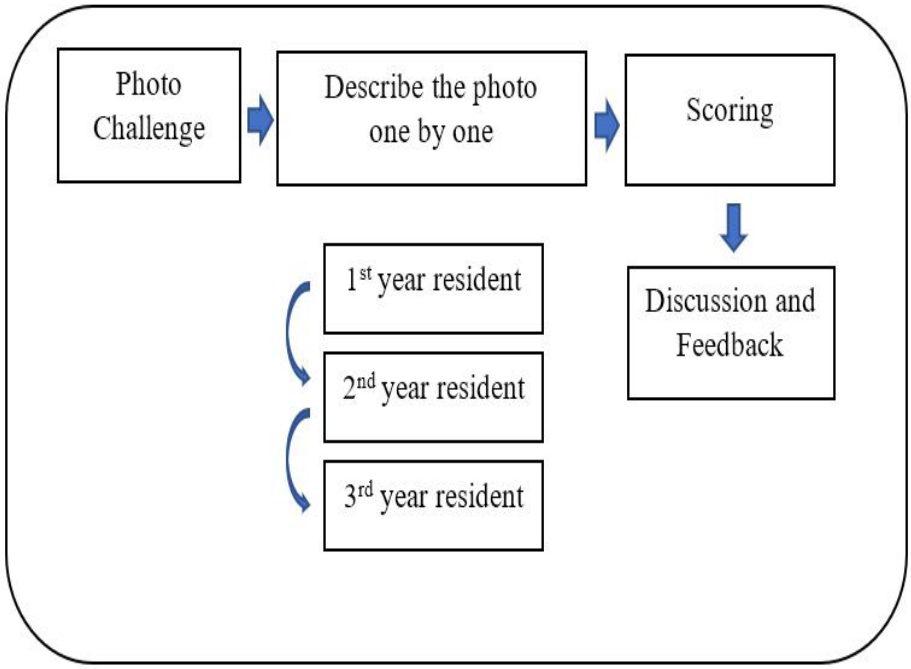

Figure 1: Study design

Diagnosis, Treatment and Prognosis.

Result

Subjectively, for all topics of knowledge in glaucoma, cornea and retina, all attendees provided improvement in knowledge level from moderate to high level. 80% of attendees gave high level of knowledge after attend all Photo Challenge activities in pediatrics and oculoplastic. A result of Objective assessment using pre and post Objective Structured Clinical Examination (OSCE) was shown in Table 3.

The mean assessment of post objective assessment using pre and post Objective Structured Clinical Examination (OSCE) shown statistically significant from 5.87 up to 8.00 out of 10. Also, all subjects give positive feedback about this innovative Photo Challenge. They favored the activity and benefited from engaging in the learning experiences as well as being given opportunities to practice clinical thinking processes by verbally approaching the clinical diagnosis from important findings and management of the disease.

The qualified instructors also provided positive feedback. They were able to perceived significantly improvement in last two Photo Challenged activity from all subjects. Clinical thinking process of all attendees was trended and well formed. The skills of history taking and clinical examination including investigation were properly performed. The knowledge of updated treatment was instructed by specialized ophthalmologists.

Discussion

Ophthalmology requires numerous image recognition. Apart from history taking, the clinical findings crucially assist clinical diagnosis. Thus, learning through images in Photo Challenge adjunct to the preceding teaching basis benefits students in several ways. It requires active learning method which forges deeper understanding through critical thinking. Also, it shifts the focus from passively digested information to energetically engagement with the activity. Moreover, it enhances a clearer understanding and aid students generate long-standing visual memories with the help of instructors.

The performance and clinical skills, including history taking, physical examination, investigation, differential diagnosis, treatment and prognosis of the disease, were significantly improved among subjects by observation and feedback. This educational course also changes in the learning behavior of the students who showed continuous enthusiasm for learning.[5]

While, traditional clinical teaching such as lecture, case report and OPD observation, are altogether using passive learning method. There are several disadvantages, which are time limitation when providing outpatient services, inadequate teaching materials, lack of teaching plan in advance, problems with noncooperative patients and its shorter span memory formed to students, compare to the photo challenge activity.

Conclusion

Photo-Challenge activities, unlike the traditional photo quiz, are engaging for learners and enable them to demonstrate knowledge and skill in clinical thinking,

Table 3 : A result of Objective assessment using pre and post Objective

	Mean score before class	Mean score after class	Improvement score**
OSCE*	5.87+-1.13	8.00+-1.25	2.13+-083

*OSCE = Objective Structured Clinical Examination
**All *P* were < 0.001 for the change in OSCE scores

applicable to everyday practice and, in addition, evaluate themselves after the quiz. Instructors are able to emphasize knowledge and guide clinical thinking relevant to the learning outcomes after each session. It can be noted that the Photo Challenge is evidently more suitable for producing intended results than traditional photo quiz in Ophthalmology studies. The Photo-Challenge's success demonstrates a counterpart of a teaching method that emphases visual detection of clinical signs and clinical thinking as learning outcomes, in context of Ophthalmology learning.

Limitations

Our study is a supplementary teaching method whereas our subjects still attended traditional teaching methods at that period. Therefore, we included every available resident regardless of their different basic knowledge and performance and style of learning, which the results may vary upon individual. The sample size is also relatively small. Finally, we did not follow the subjects' long-term retention of knowledge.

References

1.Kassirer JP. Teaching clinical reasoning: case-based and coached. Acad Med. 2010;85(7):1118–24.
2.Usatine R. Learning from images in clinical medicine. J Fam Pract. 2003;52(1):52.
3.Larsen DP, Butler AC, Roediger HL, III. Test-enhanced learning in medical education. Med Educ. 2008;42(10):959-66.
4.Prince and Felder. Prince M., Felder R. The many faces of inductive teaching and learning. J Coll Sci Teach. 2007;36:14–20.
5.Kumar GR, Madhavi S, Karthikeyan K, Thirunavakarasu MR. Role of clinical images based teaching as a supplement to conventional clinical teaching in dermatology. Indian J Dermatol. 2015;60(6):556–61.