New Refractive Adjustment Simulator for Direct Ophthalmoscopy Training

ICEYE MODEL

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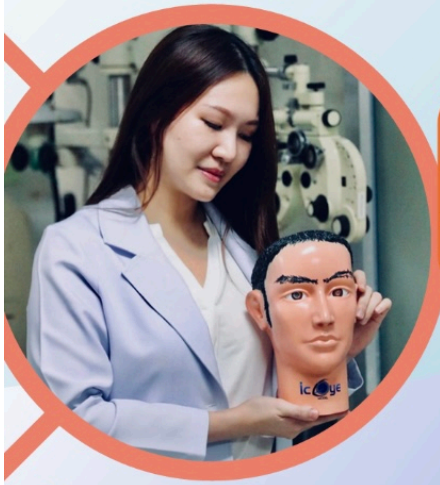

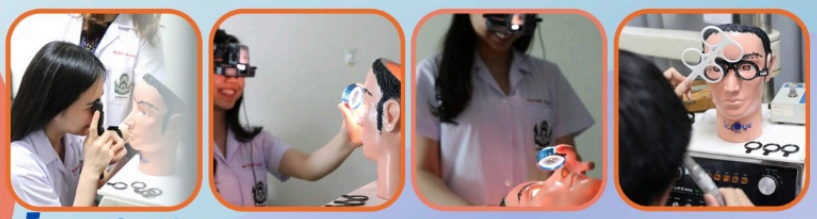

Introduction

Fundoscopic examination is crucial for the diagnosis of many conditions. Many different techniques have been developed for fundoscopic examination training. Initial plastic closed chamber was developed[1]. The others[2] also used different designs. ICEyeModel has been developed and resemble human optical system with the new add-on features at low cost.

Objective

To develop new simulator for direct ophthalmoscopy training to correct old-fashioned simulator problems

Methods

Design Innovation ; descriptive study

Innovation phase

1. Exploration the problems of old-fashioned 35mm-slide-film plastic simulator
2. Development of new simulator with consisted of 2 structures including resin human head with 4 slots and two half-sphere eyeballs attached with high plus multicoated lens
   Anterior half : hole at center as the pupil (3 pieces; 3,6,9 mm)
   Posterior half : lining inner surface with fundus photo
3. Realistic fundus photograph from KOWA™VX10 (8pieces) (figure 1.)

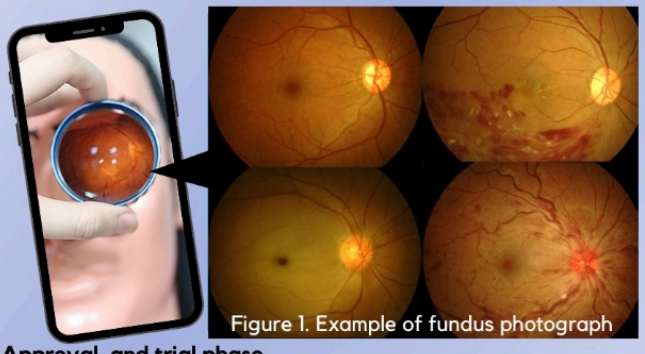

Figure 1. Example of fundus photograph

Approval and trial phase

1. Quality approval of fundus photograph and structure by retinal specialist
2. Efficacy assessment : Efficacy of Direct Ophthalmoscopy Training using New Refractive Adjustment Simulator (ICEyeModel) for Medical student, pilot study
   Primary outcome : Fundoscopic description score
   Secondary outcome : Satisfaction score

Result and Discussion

Demographic data of participants from pilot study (Table 1.)

Table 1. Total of sixth year medical students n=10

Sex	Male	2 (20%)	Corrected Refraction
	Female	8 (80%)	Without correction 6 (60%)
Age (Mean±SD)		23.1±0.05	Eyeglasses 4 (40%)
Refractive Error Status			Post Lasik 0 (0%)
	Emmetrope	5 (50%)	Contact lens 0 (0%)
	Myopia	5 (50%)	Experience of direct ophthalmoscope
	Hyperopia	0 (0%)	Never 7 (70%)
	Astigmatism	0 (0%)	1-5 times in 3 months 3 (30%)

Comparative description score between ICEyeModel and Old-fashioned (Table 2.)

Table 2. Fundoscopic description score

Group	Mean±SD	p-value*
ICEyeModel	14.0±2.31	0.047
Old-fashioned	11.20±3.26	

*Paired Sample Test

Comparative satisfaction score between ICEyeModel and Old-fashioned (Figure 2.)

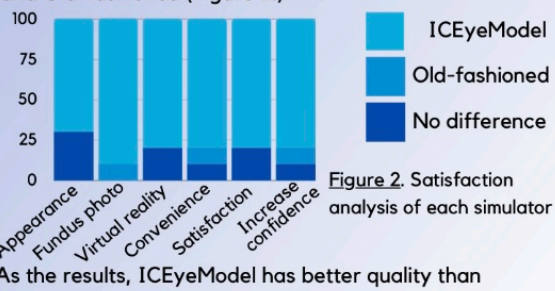

Figure 2. Satisfaction analysis of each simulator

As the results, ICEyeModel has better quality than old-fashioned model and achieved higher score of description fundoscopy examination and all aspects of satisfaction.

Conclusion

Newly designed refractive adjustment simulator "ICEyeModel" was a teaching innovation. It improves direct ophthalmoscopy training. In addition to direct ophthalmoscopy simulator, ICEyeModel could applied as indirect ophthalmoscopy and retinoscopy simulator. It could also used in incline position.

Better
teaching model
better training
outcome

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Referrence:

1. Chung KD, Watzke RC. A simple device for teaching direct ophthalmoscopy to primary care practitioners. Am J Ophthalmol. 2004;138(3)501-502
2. Larsen P, Stoddart H, Griess M. Ophthalmoscopy using an eye simulator model. Clin Teach. 2014;11(2):99–103.