COMPARISON STUDY OF FUNDUSCOPIC EXAM USING THE D-EYE DIGITAL **Children** OPHTHALMOSCOPE AND THE DIRECT OPHTHALMOSCOPE

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INTRODUCTION

- · The use of smartphones is ubiquitous in everyday life and has influenced our culture.
- · New telemedicine-based apps and accessories are being developed in the field of ophthalmology that allow the user to capture images or videos and document ocular or fundal pathologies with their smartphones.
- · With many such devices gaining popularity, the relative costs have decreased which provides the potential to enhance access to vision care in underserved areas both domestic and abroad.1
- The D-EYE digital ophthalmoscope (D-EYE Srl, Padova, Italy; https://www.d-eyecare.com) is a fundus camera that attaches to smartphones and is used in conjunction with a HIPAA-compliant app.
- · Using two students with undilated pupils as human models, we investigated the ease of use of the D-EYE in retinal screening against the conventional direct ophthalmoscope.



Figure 1 - D-EYE Retinal Imaging











Figure 2 - Students demonstrating use of the D-EYE vs DO

RESULTS

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- · 20 out of 25 students concluded that the D-EYE was easier to use than the DO. The average rating on the five point scale was 3.00 for DO and 4.08 for D-EYE.
- Of the five students who rated the D-EYE as being more difficult to use than the DO, three of them still ranked a preference for the D-EYE.
- · 23 students were able to identify the optic nerve and macula in a shorter amount of time with the D-EYE
- The Pearson Chi-Square Test had an exact p-value of 1.0 when comparing Creighton to UNMC medical students, indicating that university affiliation did not affect device preference.
- Overall, 92% (23/25) of students who participated in the study preferred the D-EYE over the DO. Students from both medical schools showed a very strong, statistically significant preference for the D-EYE (p < .001).

CONCLUSION

- · Based on the results of our study, we concluded that the D-EYE is a viable tool that could be incorporated into medical student education, as well as clinical practice based on studies that indicate its utility in screening for retinal pathologies such as ocular hypertension and primary open angle glaucoma.^{2,3}
- · Many noted that the D-EYE provided a larger field of view at a further distance away from the patient, making it easier to locate the optic disc and visualize blood vessels. This made it more comfortable for both the examiner and the student models. Especially in a hospital setting, this may provide a safer distance from the patient for the examiner.
- Students enjoyed the recording feature of the D-EYE, commenting that this would facilitate improved communication with patients and physicians of other medical specialties. 92% of students also noted that the D-EYE method was faster than the DO.

REFERENCES

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METHODS

- · 25 medical students from the University of Nebraska Medical Center (UNMC) and Creighton University School of Medicine examined the fundi of two undilated participants using the traditional direct ophthalmoscope (DO) and the D-EYE digital ophthalmoscope to assess the ease of use of the D-EYE device on patients.
- · Students used D-EYE video setting on autofocus for extended retinal viewing on an undilated emmetropic eye, which offers a field of view of 5-8 degrees.
- Both methods were performed in a dimly lit room to maximize pupil dilation.
- · Students then had to describe their findings and show the video taken from the smartphone to the researchers
- · Each student was asked to fill out a survey regarding their subjective experiences learning to use the two different methods. The survey asked students to rate the difficulty of each method on a scale of 1 to 5, with 1 being most difficult and 5 being least difficult. It also asked them to rate their preference between the two methods. Finally, students were asked to leave any comments in their own words about the experiment and the D-EYE device.