



**WAYNE STATE**  
School of Medicine

# Leveraging Online Interactive Learning Videos to Support Medical Student Education on Common Ophthalmic Disorders

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## Introduction

The World Health Organization estimates that nearly 1 billion people worldwide have preventable vision impairments.<sup>1</sup> Despite such a high prevalence of ocular disorders, teaching of ophthalmology in medical curriculum has slowed and shifted to the preclinical years.<sup>2</sup> One potential opportunity to supplement this loss is by utilizing online interactive learning videos. This study assessed the educational impact of virtual reality videos developed by the National Eye Institute (NEI) on students' comfort of understanding cataracts, glaucoma, diabetes, and age-related macular degeneration.

## Methods

**Study Population:** 299 second year medical students at Wayne State University were enrolled in this study.

**Survey:** Prior to the intervention, students were provided with a PowerPoint on the four common ocular disorders and a video on a basic eye exam. A survey with NEI videos embedded was then administered to assess students' pre- and post-comfort levels with understanding the common vision disorders. Each video was only a few minutes long. 274 responses were collected.

**Statistical Analysis:** IBM SPSS Statistics was used to perform a Wilcoxon signed-rank test and stepwise multiple regression analysis. Five-point Likert scales were utilized in the survey to assess student comfort levels, with 1 representing "not comfortable" and 5 representing "very comfortable" in their comfort of understanding the vision disorder. Hedge's g values were calculated to determine the effect sizes. This study represents a work-in-progress as we continue to work on writing the manuscript and refining the statistical analysis.

## Figures

**Figure 1**

Pre and post-video comfort level for students viewing National Eye Institute videos for cataracts, glaucoma, diabetic retinopathy, and age-related macular degeneration (AMD), respectively.

NEI Video	Pre-Video Comfort Level			Post-Video Comfort Level			p	g
	N	Mdn	SD	N	Mdn	SD		
All 4 Eye Disorders	274	3	1.202	273	4	0.803	<0.0001	1.040
Cataracts	273	3	1.224	274	4	0.752	<0.0001	1.231
Glaucoma	274	3	1.303	273	4	0.800	<0.0001	0.989
Diabetes	273	3	1.317	272	4	0.823	<0.0001	0.847
AMD	273	3	1.306	274	4	0.870	<0.0001	0.956

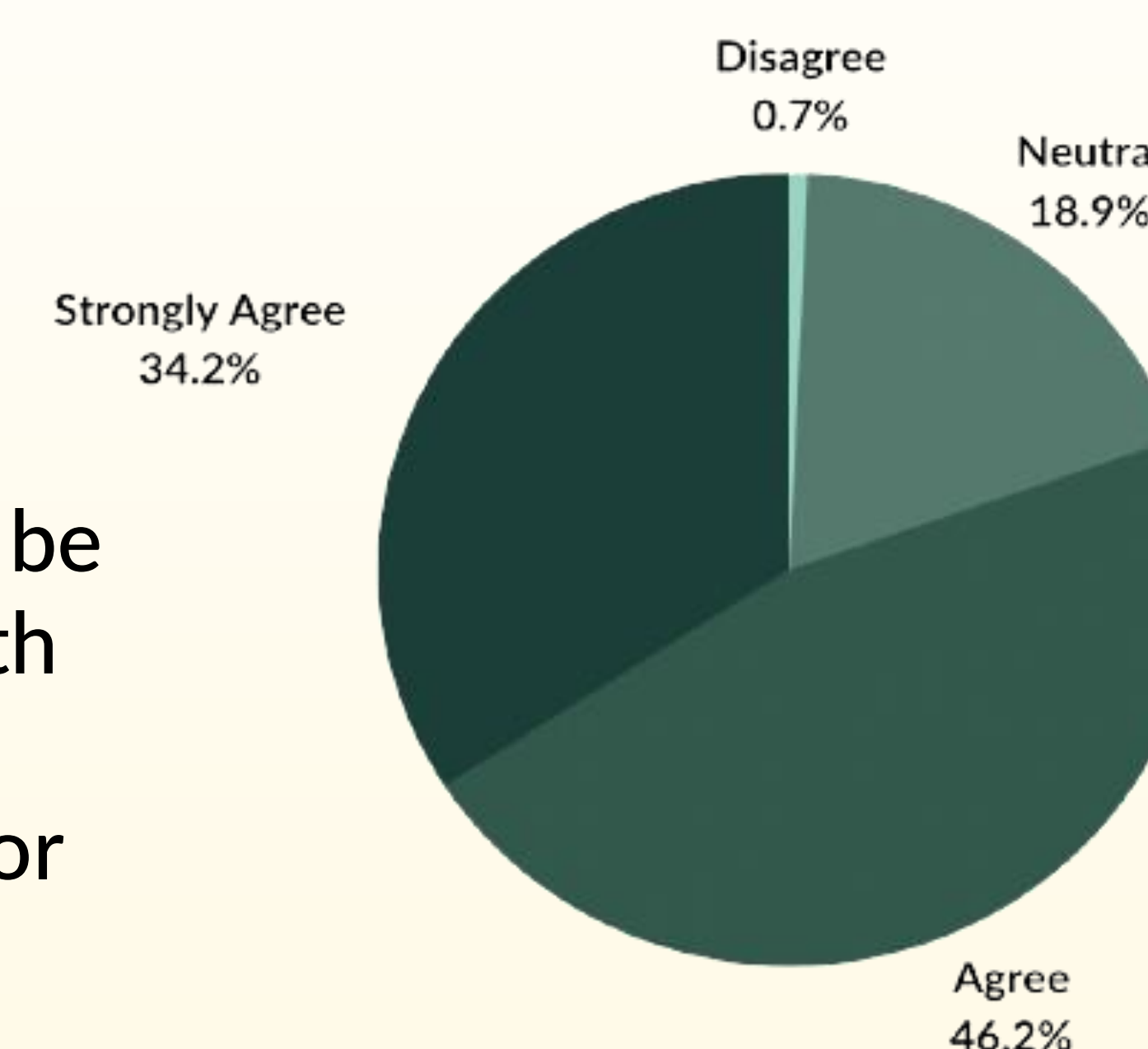
**Figure 2**

Stepwise Multiple Regression Analysis of Predictor Variables on Students' Understanding of the Four Eye Disorders After Watching the NEI Videos

Model		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	Std. Error	Beta		
1	Intercept	3.740	0.055		67.446	<.001
	Has Previous Experience in Eye Care	0.311	0.103	0.182	3.029	0.003
2	Intercept	3.538	0.087		40.845	<.001
	Has Previous Experience in Eye Care	0.314	0.101	0.184	3.107	0.002
	Reviewed the NEI PowerPoint	0.295	0.099	0.177	2.996	0.003

## Future Curriculum

Students were asked whether the patient perspective eye disease videos should continue to be a part of the M2 eye-health teaching session. The majority agreed (46.18%) or strongly agreed (34.18%) with this statement.



## Results

**Wilcoxon Signed-Rank Test:** demonstrated a significant increase in the comfort of understanding how common eye diseases can affect a person's vision after viewing all four NEI videos in the survey compared to before ( $p < 0.0001$ ). Similar results were seen for each NEI video on cataracts, glaucoma, diabetes, and AMD analyzed separately ( $p < 0.0001$ ). (Figure 1).

**Stepwise Multiple Regression:** revealed that having previous experiences in eye care ( $B = 0.314$ ,  $SE = 0.101$ ,  $p = 0.002$ ) and reviewing the PowerPoint beforehand ( $B = 0.295$ ,  $SE = 0.099$ ,  $p = 0.003$ ) were significant positive predictors of the results. (Figure 2).

## Conclusion

Comprehensive education on ocular disorders during medical school is needed to prepare students with knowledge to diagnose and treat common eye disorders. The use of online educational videos may help bridge gaps in ophthalmic education within the medical school curriculum.

## References

- World Health Organization. World report on vision. Geneva: World Health Organization; 2019. License: CC BY-NC-SA 3.0 IGO.
- Moxon NR, Goyal A, Giaconi JA, et al. The State of Ophthalmology Medical Student Education in the United States: An Update. *Ophthalmology*. 2020 ;127(11):1451-1453. doi:10.1016/j.optha.2020.05.001