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Uptake of Eye Screening Services Among People Living with Diabetes in the US; Examining the Role of Health Insurance Coverage in Access to Care

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**Uptake of Eye Screening Services Among
People Living with Diabetes in the US;
Examining the Role of Health Insurance
Coverage in Access to Care**

Appalachian Student Research Forum

April 25, 2023

**Kusse Toitole (MD), Melissa White (DrPH), Shimin
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**EAST TENNESSEE STATE
UNIVERSITY**

OUTLINE

- INTRODUCTION
- METHODS
- RESULTS
- DISCUSSION AND CONCLUSION
- REFERENCES
- ACKNOWLEDGMENT



INTRODUCTION

- CDC (2019): 37.1 million (14.7%) US adults (≥ 18 yrs) had diabetes
- Diabetic retinopathy - leading cause of blindness
- NCHS (2016-2017), 4.1% of adults ≥ 45 yrs lost vision due to diabetic retinopathy
- Diabetic retinopathy > 16 million people with diabetes by 2050



INTRODUCTION cont...

- Annual routine eye exam prevent 95% of vision loss caused by diabetes. (ADA)
- ~50% of people with diabetes do not receive the recommended annual eye screening exams (CDC)
- Economic, social, and health system factors influence eye screening
- Adherence with annual eye exams not improved over the past decade (2005-2016, NHANES)

Jotte A, et al, 2022

Eppley SE, et al 2019



INTRODUCTION cont...

- Scarcity of literature assessing the specific role of health insurance
- Lack of insurance coverage associated with low adherence in follow up eye exam
- Some studies showed no association between eye exam and health insurance
- **Aim of the study:** to assess if having health insurance had an impact on eye screening

Song A, et al, 2022

Kuo J, et al, 2022



METHODS

- **Data source:** 2021 BRFSS (National)
- **Study population:** Adults ≥ 18 years who self-reported living with diabetes.
- **Outcome measure:** eye exam (≥ 1 in past 1 yr)
- **Main predictor variable:** health insurance
- **Covariates (Andersen Model):**
 - age - income - course - hgbA1C
 - sex - employ - retinopathy - feet check
 - race - home - HTN - physician visit
 - edu - provider - county - insulin



METHODS cont...

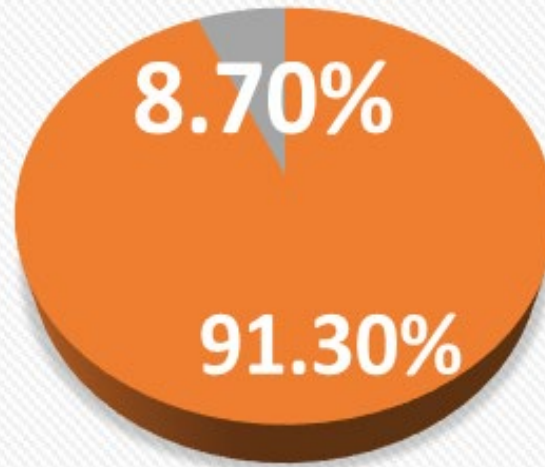
- Chi-square analysis, bivariate analysis and multivariable logistic regression with OR and 95% CI, p-value 0.05
- Eye screening \Leftarrow health insurance
- Eye screening \Leftarrow covariates
- Adjusting for other covariates \gg eye screening and health insurance



RESULTS

Health Insurance Access

N = 57,616



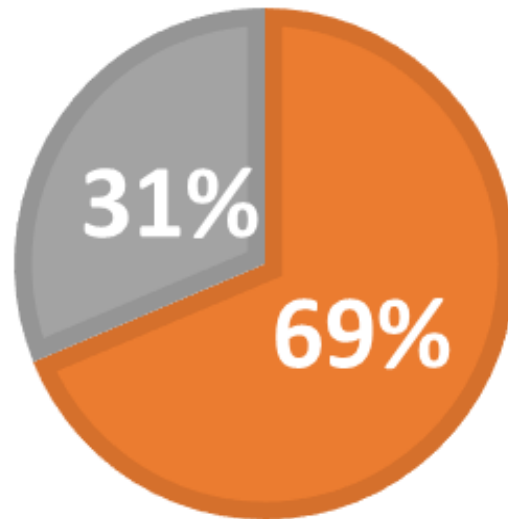
■ Yes ■ No



RESULTS cont...

ANNUAL EYE EXAM STATUS AMONG ADULTS
LIVING WITH DIABETES IN THE US, N=57,616

■ Yes ■ No



RESULTS cont...

		Eye Exam	
		Yes	No
Health Insurance	Yes	14,492 (68.6%)	6,249 (31.4%)
	No	762 (44.8%)	688 (55.2%)
OR = 2.69		95%CI: 2.122 - 3.416	P-value: 0.000



RESULTS cont...

	Eye Exam		Unadjusted OR	P-Value
	Yes	No		
Age (yrs)				
18-34	211 (42.7%)	255 (57.3%)	Reference	
35-54	2,229 (58%)	1,608 (42%)	1.86 (1.294-2.661)	0.001
55-64	3,409 (64.9%)	1,864 (35.1%)	2.48 (1.740-3.536)	0.000
>65	9,405 (73.9%)	3,210 (26.1%)	3.81 (2.687-5.398)	0.000
Income (\$)				
<25,000	2,853 (59.9%)	1,713 (40.1%)	Reference	
25,000 up to <50,000	3,894 (66.5%)	1,794 (33.6%)	1.33 (1.112-1.582)	0.002
>=50,000	5,325 (71%)	2,008 (29%)	1.64 (1.385-1.940)	0.000
Not Sure	3,182 (64.8%)	1,422 (35.2%)	1.23 (1.030-1.480)	0.022



RESULTS cont...

- Adjusting for other covariates, the odds of having an eye exam were 1.58 times higher among adults with insurance than those without (aOR=1.58, 95%CI=1.191-2.094)
- In multivariable analysis, association seen in;
 - age
 - sex
 - other race
 - college edu
 - income
 - home
 - provider
 - course
 - retinopathy
 - hgbA1C
 - feet check
 - physician visit



RESULTS cont...

	Eye Exam		Adjusted OR	P-Value
	Yes	No		
Health Insurance				
Insured	14,492 (68.6%)	6,249 (31.4%)	1.58 (1.191-2.094)	0.001
Not Insured	762 (44.8%)	688 (55.2%)	Reference	
Age (yrs)				
18-34	211 (42.7%)	255 (57.3%)	Reference	
35-54	2,229 (58%)	1,608 (42%)	1.53 (1.069-2.198)	0.020
55-64	3,409 (64.9%)	1,864 (35.1%)	2.04 (1.403-2.972)	0.000
>65	9,405 (73.9%)	3,210 (26.1%)	2.96 (1.991-4.410)	0.000
Income (\$)				
<25,000	2,853 (59.9%)	1,713 (40.1%)	Reference	
25,000 up to	3,894 (66.5%)	1,794 (33.6%)	1.16 (0.958-1.414)	0.127
>=50,000	5,325 (71%)	2,008 (29%)	1.26 (1.017-1.562)	0.035
Not Sure	3,182 (64.8%)	1,422 (35.2%)	1.11 (0.906-1.371)	0.307



Discussion

- Health insurance strong predictor of eye exam > other study, NHANES (2005-2016)
- Increased eye exam in older age, similar to another study at academic primary care clinic
- In general individuals with a good socio-economic status are more likely to have an eye exam

Eppley MS, et al, 2019

Kuo J, et al, 2020



Discussion cont...

- Insurance is an underpinning factor
- Improving access to insurance can potentially enhance service uptake
- Implications for addressing other socioeconomic and health system factors



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Thank You!

