# The perspective of Ophthalmologists in India on Artificial Intelligence supported Diabetic Retinopathy screening by non-ophthalmologists



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### Background

- Escalating prevalence of diabetic retinopathy (DR) globally.
- India highest magnitude of people living with diabetes mellitus (PwDM) (1-3)
- Shortage of Ophthalmologists and healthcare workers (4)
- Demand for diagnostic solutions is critical
- Artificial Intelligence (AI) demonstrated diagnostic accuracy in DR screening, making it a potential solution (5-7)
- Non-ophthalmologists' healthcare professionals shown proficiency in DR screening (8 -11) and cost effective (12,13)
- Ophthalmologists' acceptance of non-ophthalmologists using AI-based tools for DR screening.

### Aim

To explore the role of AI supported DR screening by non-ophthalmologists as perceived by Ophthalmologists in India



#### Objectives To assess the To explore the Amongst the DR perceived or acceptance and ophthalmologists, to To assess **Knowledge** experienced **benefits** readiness of on AI supported DR explore the role of and barriers of using **Ophthalmologists** to non-ophthalmologists screening by non-AI supported DR use AI supported DR ophthalmologists in screening for DR screening by nonscreening by nonusing AI-based tools ophthalmologists Ophthalmologists

### Materials & Methods

### **Setting:**

- All eye care facilities
- Public or government hospitals
- Private or Non-governmental hospitals
- Two districts in India:
- Dakshina Kannada, Karnataka
- U Vellore, Tamil Nadu



Location of these districts in Karnataka and Tamil Nadu, India

Purposive sample

### Study design, Data collection: Mixed Method approach

Stratified Random sample (Computer-generated) All eligible Ophthalmologists in two districts

## **Acceptance & Readiness of Ophthalmologists**

Knowledge details	Acceptance	Willing to share tasks	<b>Readiness to integrate</b>	
Knowledge details	AOR (95% CI), P value			
AI in DR screening	12.47(1.39 to112.48)	21.26 (2.29 to 197.65)	8.40 (1.49 to 47.36)	
	( <b>p</b> = <b>0.025</b> )	( <b>p</b> = <b>0.007</b> )	( <b>p=0.016</b> )	
Non-ophthalmologists in DR screening	8.41(2.02 to 35.08)	9.81 (2.47 to 38.94)	6.62 (1.85 to 23.74)	
	( <b>p</b> = <b>0.003</b> )	( <b>p</b> = <b>0.001</b> )	( <b>p</b> = <b>0.004</b> )	

### **Role of Non-ophthalmologists (Thematic analysis)**





Ethical Approvals: London School of Hygiene & Tropical Medicine, UK; Christian Medical College, Vellore; Yenepoya Deemed (to be) Medical University, Mangalore



### education

### **Key Findings**

- > Majority (96.8%) of Ophthalmologists regularly screen for DR in clinical practice
- Benefits: increased accessibility, efficiency
- **Barriers**: lack of training, legal/ ethical concerns
- Roles for non-ophthalmologist: preliminary DR screening, follow-up care, public health education, and screening in rural/ remote areas
- Awareness significantly impacts acceptance, willingness to share tasks and integrate AIsupported DR screening by non-ophthalmologists

### Conclusions

- □ Non-ophthalmologists play a key role in expanding DR screening, particularly in underserved areas.
- □ AI-assisted DR screening by non-ophthalmologists enhances early detection and efficiency.
- Ophthalmologists' engagement is critical.
- Raising awareness and implementing clear policies will accelerate integration of AI-supported DR screening by non-ophthalmologists.

### Recommendations

- Increase awareness among ophthalmologists about AI-assisted DR screening and role of nonophthalmologists.
- Develop clear protocols for AI-supported DR screening by non-ophthalmologists.
- Support research to enhance AI algorithm accuracy and reliability.

-			(n=31)	
DR screening in (years)	Mean $\pm$ SD	$12.68 \pm 8.72$	$13.71 \pm 8.61$	$11.69 \pm 8.84$
	Median	10	14	9.5
Number of DR cases screened/ week	Mean $\pm$ SD	$26.32 \pm 35.08$	$19.19 \pm 19.75$	$33.22 \pm 44.53$
	Median	20	10	20
DR Ophthalmologists	DR screening in (years)	Mean ± SD Median	8.83 ± 4.28 9.5	
	Number of DR cases screened/ week	Mean ± SD Median	$35.83 \pm 27.54$ <b>30</b>	
Knowledge on A	AI in DR screenin	g	·	
Knowledge details	Overall (N = 63)			
AI in DR screening	82.5%			
Non-ophthalmologists in	69.8%			
AI assisted DR screening	46%			
Confidence in Diagnosti	25%			

Train non-ophthalmologists in AI-assisted DR screening.

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