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[Correction added on 29 September 2023, after first online publication: The second author's name has been corrected from 'Wang Yue' to 'Yue Wang']

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Bridging healthcare disparities in diabetic retinopathy care: Insights from Sri Lanka

Diabetes mellitus (DM) was once considered a disease of developed nations. In recent years, however, its prevalence has risen rapidly in low- and middle-income countries (LMICs), with an estimated 422 million individuals affected globally.[1] The prevalence of diabetic retinopathy (DR) in Sri Lanka is reported to be as high as 30%, underscoring the urgent need for strategies to address detection and treatment.[2] We conducted a study in Colombo, Sri Lanka that demonstrated noteworthy disparities in healthcare provision for DR across private and public hospitals. Our investigation, carried out between February and June 2022, aimed to assess and compare DR screening rates among diabetic patients attending three hospitals in Colombo: a government public hospital, a private diabetes hospital, and a private general hospital. This research provides a comprehensive analysis of differences in clinical workflow between private and public hospitals and sheds light on their implications for DR screening practices.

The vast majority of patients from the public hospital reported that their diabetes doctors routinely screened them for diabetic eye disease. Patients from private hospitals were less likely to be screened by their internist ($p < 0.00001$) and more likely to be referred to ophthalmologists for DR screening ($p < 0.00001$) (Table 1). When we asked whether patients received dilated eye exams, the gold standard for DR screening, we found that 61% of all study participants underwent DR screening at least once in the 12 months preceding the study, and screening rates did not statistically differ significantly between patients attending public hospitals (60%) and those attending private hospitals (62%) (Table 1). The proactive involvement of diabetes doctors in DR screening, despite their non-ophthalmological

TABLE 1 Patient responses regarding diabetic retinopathy screening.

	Public hospital, $n = 320$ N (%)	**Private hospital, $n = 326$ N (%)**	**p**
Did your diabetes doctor screen you for diabetic eye disease?—Yes	302 (94%)	279 (86%)	**<0.00001**
Have you had your eyes checked in the last 12 months?—Yes	192 (60%)	201 (62%)	0.420
Did your doctor put in eye drops to dilate the eyes for examination (this might have made you sensitive to light)?—Yes	303 (95%)	278 (85%)	**<0.00001**
Have you ever been screened for diabetic eye disease?—No	11 (3.4%)	22 (6.7%)	**<0.001**
How did COVID affect your diabetic retinopathy screening?			
It continued unchanged	80 (26%)	142 (56%)	**<0.00001**
It delayed my screening	230 (74%)	182 (44%)	

Note: Bold indicates statistically significant values $p < 0.05$.

TABLE 2 Demographics.

	Total N	**Public $n = 320$ Mean (% or #)**	**Private $n = 326$ Mean (% or #)**	**p**
Age (years)	643	59.8	56.9	**0.0018**
Sex (% male)	646	55.8%	33.4%	**<0.0001**
Monthly income (LKR)	643	29, 073	132, 622	**<0.0001**
Years since diabetes diagnosis	645	12.8	13.4	0.4566
Diabetes medications (#)	645	2.4	3.2	**<0.0001**
Number (%) insulin treated[a]	221	136 (42.5%)	85 (26.1%)	**<0.0001**
Duration of insulin treatment (years)[a]	221	6.6	6.4	0.8541
Comorbidities (#)	646	4.2	3.0	**<0.0001**
BMI (kg/m^2)	636	25.9	25.6	0.4193
Systolic BP (mmHg)	644	132	136	**0.0111**
HbA1c level (%)	610	8.9	7.7	**<0.0001**

Note: Bold indicates statistically significant values $p < 0.05$.

[a]Note that data are based on the 221 patients who were taking insulin therapy for diabetes management at the time of the survey.

background, appears to be helpful in ensuring timely screening.

Among all study participants, 5.1% reported never having undergone DR screening. This proportion was higher among patients in private hospitals compared to those in public hospitals (Table 1). This observation suggests potential missed opportunities for early detection and intervention among diabetic patients in private hospitals, potentially due to barriers impeding patients' engagement with screening services. The aforementioned approach within the public healthcare system streamlines the screening process and enhances the potential for timely detection.

Our data show that screening patterns are different. It is possible that there are differences in the disease burdens of the patient populations that either led to or justified different screening approaches. Indeed, our study found that patients receiving care from the public hospital had a greater burden of disease as evidenced by higher mean HbA1c levels ($p < 0.0001$) and more comorbidities ($p < 0.0001$) (Table 2). Perhaps not surprisingly, COVID-19 also played a role in patient access to DR screening during this period. COVID-19 disproportionally delayed DR screening for those receiving care at the public hospital, a population with a higher burden of disease and lower incomes. In fact, 74% of patients in the

public hospital reported that their DR screening was delayed due to COVID-19, whereas only 44% of patients in the private hospitals had their DR screening delayed due to COVID-19 (Table 2). This result reinforces a healthcare trend highlighted by the pandemic: patients who are most affected by disease are often least able to access screening and preventive care.[3]

Although our work was completed in a single city, the implications of our study extend beyond Colombo and beyond Sri Lanka. As nations grapple with the mounting burden of diabetes and its associated complications, the lessons derived from our study provide valuable insights for crafting effective interventions.[4,5] Integrated approaches, akin to those adopted by public hospitals in Colombo, have the potential for improved patient outcomes. Whether the screening is as effective as an ophthalmologic dilated eye exam is unresolved, but by screening for DR within a diabetes appointment, the chance that patients are lost to follow up before they are screened is reduced. By fostering collaboration among providers and optimising resource utilisation, such programs can enhance early detection and mitigate the risk of vision loss. For the international ophthalmic community, our research underscores the importance of context-specific interventions that consider socioeconomic status, healthcare infrastructure, and patient perceptions. In LMICs facing healthcare disparities, innovative models, such as involving diabetes doctors in early retinopathy screening, hold potential for improved outcomes.

In conclusion, our study provides a perspective on the interplay between clinical workflows, patient perceptions, and DR screening practices. By demonstrating the disparities between private and public hospitals and highlighting the role of national screening programs, we contribute to the global discourse on enhancing DR care. We believe that the insights presented here can influence discussions on healthcare delivery and inspire collaborative efforts to enhance eye care worldwide.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

ETHICS STATEMENT

Ethics approval for this study was obtained by both the University of Michigan Institutional Review Board (HUM00172388) and the National Hospital Ethics Committee in Sri Lanka (EC-21-125).

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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