

# Diabetic Retinopathy Screening using Digital Nonmydriatic Fundus Photography by General Practitioners versus Dilated Fundus Examination by Ophthalmologists: A Performance Comparison

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**Objective:** To compare the efficiencies of diabetic retinopathy screening using digital fundus photography by general practitioners versus dilated fundus examination using slit-lamp biomicroscopy by ophthalmologists.

**Design:** Prospective, comparative, instrumental validation study

**Participants:** Sixty-two diabetes mellitus patients aged 20-80 years with no history of diabetic retinopathy were included.

**Materials and Methods:** The fundus photographs through non-dilated pupils were taken using the digital fundus camera, evaluated by general practitioners, and graded for diabetic retinopathy according to the Early Treatment of Diabetic Retinopathy Study (ETDRS) including the presence or absence of macular edema. The pupils were dilated using 1% Mydracyl every 5 minutes for 6 times. Ophthalmologists then performed comprehensive fundoscopic examination using the slit-lamp biomicroscopy.

**Results:** Two methods were assessed for comparative agreement. Sensitivity, specificity, positive and negative predictive value of the digital fundus photography for diabetic retinopathy screening by general practitioners were 80.95%, 97.56%, 94.44% and 90.91%, respectively. Prevalence of diabetic retinopathy was 33.87%. The weighted kappa was 0.898. Standard error and 95% Confidence interval were 0.0428 and 0.814 – 0.982.

**Conclusion:** This study suggested that the screening efficiency of using nonmydriatic digital fundus photography by general practitioners was comparable to the dilated fundus examination by ophthalmologists. Both methods can be used for diabetic retinopathy screening. However, the fundus photographs must be high quality, and the general practitioners must be well-trained.