

Retinopathy



What factors prevent young people with T2D attending retinal screening?

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The incidence of T2D in young adults continues to grow worldwide and we know that this group differs in many ways to their older counterparts. They face unique challenges in the management of their diabetes and may not engage fully with the current diabetes support services. A fascinating paper from Australia by Lake and colleagues (summarised alongside) recently investigated the barriers and facilitators to diabetic eye disease screening in young adults (aged 18–39 years) with T2D.

The study comprised semi-structured telephone interviews with 10 young adults (YA) and 20 older (aged 40+ years) adults (OA). A specially developed and validated interview guide, informed by the Theoretical Domains Framework (TDF), was used to explore screening facilitators and barriers.

The final validated guide comprised 39 TDF-based questions and covered social influences, beliefs about consequences, reinforcement, intentions, emotion, knowledge, environmental context and resources, goals, beliefs about capabilities, social professional role and identity, behaviour regulation, skills, memory, attention and decision making, and optimism.

An interesting side aspect of the study was the difficulty in recruiting YA to the study, despite wide advertisement on social media.

The study explored the individual facilitators and barriers to screening. The responses provide a fascinating insight into the beliefs and thought processes in both age groups. More than 80%

of all facilitator references for both groups were captured by six TDF domains: “social influences” (reminders from healthcare providers and family members); “beliefs about consequences” (the reassurance gained from a clear screen or early detection outweighed the cost or discomfort due to mydriasis); “reinforcement” (avoiding negative outcomes, such as visual impairment); “intentions”; “emotion”; and “knowledge” (most study participants understood the connection between diabetes and eye health, but detailed knowledge was lacking).

Similarly, more than 80% of all barrier references for both groups fell under the following domains: “environmental context and resource” (financial stress and work constraints were prominent barriers in the young group, and the inconvenience of mydriasis in both groups); “knowledge” (lack of symptoms combined with perceptions of invulnerability in the young group); “social influences and beliefs” about consequences. In addition, an “emotion” barrier existed for YA (negative emotions and fear about their diagnosis of diabetes) and the older group reported behavioural regulation (missing or forgetting appointments).

It is clear from this study that there are many challenges when encouraging individuals to take part in diabetic eye screening and that specific tailored strategies may need to be developed, especially with regard to young adults with T2D. These approaches are likely to be applicable to all aspects of diabetes care. ■

J Diabetes Complications

Factors influencing uptake of retinal screening in young adults

Readability ////
Applicability to practice ///
WOW! Factor ✓✓

1 This qualitative study aimed to identify facilitators and barriers associated with retinal screening among young adults with T2D. A group of young adults was compared to a parallel group of older adults in order to determine the relative influence of the factors.

2 Semi-structured telephone interviews were conducted with 10 younger adults (aged 18–39 years) and 20 older adults (aged 40+ years). Data were coded using the Theoretical Domains Framework (TDF). Facilitators and barriers were systematically compared between the two groups.

3 Both groups reported similar facilitating factors, including “social influences”, “beliefs about consequences”, “reinforcement”, as well as intentions, emotions and knowledge.

4 Barrier references were also similar for both groups, although the younger adults made more references to barriers, compared to the older group. Specifically, young people referred to negative emotions and fear. The older group referred to behavioural regulation with regard to barriers (forgetting appointments, for example).

5 This study concludes that young adult retinal screening behaviour is influenced by additional social cognitive factors compared to older adults and the authors suggested that this information should influence future retinal screening interventions.

Lake AJ, Browne JL, Rees G, Speight J (2017) What factors influence uptake of retinal screening among young adults with type 2 diabetes? *J Diabetes Complications* **31**: 997–1006

Ophthalmology

Diabetic retinopathy among young people

Readability ✓✓✓✓
 Applicability to practice ✓✓✓✓
 WOW! Factor ✓✓

- This retrospective observational cohort study explored risk factors for diabetic retinopathy (DR) among young people with diabetes (≤ 21 years) in the US. It sought to compare the DR rates between young people with T1D and T2D and also looked at adherence to screening.
- A DR diagnosis was received by 14.4% of the young people studied. Among the 2240 young people with T1D and 1768 with T2D, 20.1% and 7.2% developed DR over a median follow-up time of 3.2 and 3.1 years, respectively.
- Kaplan–Meier survival curves showed that DR developed faster in young people with T1D compared to T2D ($P < 0.0001$).
- Young people with DR had a higher median HbA_{1c} (58 mmol/mol [7.5%]) than that of young people without DR (46 mmol/mol [6.4%]).
- For every 1-point increase in HbA_{1c}, the hazard for DR increased by 20% (hazard ratio [HR], 1.20; 95% confidence interval [CI], 1.06–1.35) and 30% (HR, 1.30; 95% CI, 1.08–1.56) among young people with T1D and T2D, respectively.
- American guidelines suggest that ophthalmic screening begins 3 to 5 years after initial diabetes diagnosis. In this study, >18% of young people with T1D would already have received a DR diagnosis if screening began at 3 years and 25% of them at 5 years.
- The authors propose that young people with T1D and T2D be screened early in order to ensure a timely DR diagnosis and to limit disease progression.

Wang SY et al (2017) Incidence and risk factors for developing diabetic retinopathy among youths with type 1 or type 2 diabetes throughout the United States. *Ophthalmology* **124**: 424–30

Diabet Med

Factors affecting DR screening rates

Readability ✓✓✓✓
 Applicability to practice ✓✓✓✓
 WOW! Factor ✓✓

- This study aimed to investigate the demographic and primary care practice level variables that influence retinopathy screening uptake. Data from The Oxfordshire Diabetic Eye Screening Programme were extracted for 21 797 people registered with 79 general practices.
- Uptake was examined by gender, age group and method of screening (mobile unit at GP surgery versus high-street optometrist). Availability of screening appointments at high-street optometrists was determined by telephone surveys.
- Of those people invited for screening during the study period, 82.4% attended and screening attendance was higher for men (83.2%) than for women (81.5%; $P = 0.001$). Uptake was lowest among people aged 12–39 years (67%) and those ≥ 80 years (79%).
- Uptake was higher for people invited for screening by mobile units (83.5%) than for those invited by high-street optometrists (82%; $P = 0.006$), despite the latter being thought to offer greater appointment flexibility.
- Those people registered with GP surgeries in the most-deprived areas were least likely to attend for screening. The existing screening provision also may not be effective at achieving high uptake for the youngest and oldest age groups.
- Unexplained heterogeneity in uptake between general practices suggests that practice-level factors may have an important role in determining rates of attendance, and this could be the focus of further research.

Moreton RBR, Stratton IM, Chave SJ et al (2017) Factors determining uptake of diabetic retinopathy screening in Oxfordshire. *Diabet Med* **34**: 993–9

Ophthalmology

Automated vs human grading for DR

Readability ✓✓✓✓
 Applicability to practice ✓✓✓✓
 WOW! Factor ✓✓

- This observational measurement comparison study aimed to determine whether automated diabetic retinopathy image assessment systems (ARIAS) provide clinically effective and cost-effective detection of retinopathy, compared to human graders (reference standard).
- Retinal images from 20 258 individuals attending routine retinopathy screening were manually graded using a standard protocol. The same images were processed by three ARIAS: iGradingM, Retmarker and EyeArt.
- Automated systems were assessed for performance (sensitivity, false-positive rate) and diagnostic accuracy. Economic analysis was carried out to determine costs.
- Sensitivity point estimates (95% confidence intervals) of EyeArt were: 94.7% (94.2–95.2%) for any retinopathy, 93.8% (92.9–94.6%) for referable retinopathy (human graded as either ungradable, maculopathy, preproliferative, or proliferative) and 99.6% (97.0–99.9%) for proliferative retinopathy.
- The results for Retmarker were: 73.0% (72.0–74.0%) for any retinopathy, 85.0% (83.6–86.2%) for referable retinopathy and 97.9% (94.9–99.1%) for proliferative retinopathy.
- Unfortunately, iGradingM classified all screening episodes as disease or ungradable; hence, although the sensitivities were 100%, the false-positive rate was also 100%.
- EyeArt and Retmarker saved costs compared with manual grading both as a replacement for initial human grading and as a filter prior to primary human grading, although the latter approach was less cost-effective.

Tufail A, Rudisill C, Egan C et al (2017) Automated diabetic retinopathy image assessment software: Diagnostic accuracy and cost-effectiveness compared with human graders. *Ophthalmology* **124**: 343–51

“Young adult retinal screening behaviour is influenced by additional social cognitive factors compared to older adults; this information should influence future retinal screening interventions.”