

Quality of life and health utility values in patients with diabetic retinopathy – A targeted literature review



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Introduction

- Diabetic retinopathy (DR) is a chronic progressive condition that can lead to varying degrees of visual impairment.¹
- Although DR is asymptomatic in the early stages, electrophysiological abnormalities in function of the inner layer of the retina have been recorded as early as six months after the diagnosis of diabetes, even in the absence of visible DR.¹
- DR was found in 25.48% of patients, with NPDR (non-proliferative diabetic retinopathy) in 19.02%, PDR (proliferative diabetic retinopathy) in 1.16%, DME (diabetic macular edema in 4.96%, and PDR (proliferative diabetic retinopathy) with DME (diabetic macular edema) in 0.33% of the group.²
- DR health state is associated with a decrement in utility value compared with the absence of retinopathy in patients with type 2 diabetes.³

Objectives

- The aim of this targeted literature review is to identify the recent literature evidence on health-related quality of life (HRQoL) and health utilities in patients with DR.

Methods

- A literature search was conducted in Embase and Medline to identify English-language articles published between 2017 and November 2021, using “diabetic retinopathy” medical terms and HRQoL and health utility terms. Clinical trials and observational studies were of interest.
- All the identified abstracts and followed by full-texts were screened against the eligibility criteria by two independent reviewers. Data extraction and validation done by two independent reviewers.

Table 1: Study eligibility criteria

PICOS	Inclusion criteria
Populations	All age group patients with diabetic retinopathy/diabetic eye disease
Interventions/Comparators	No limit
Study designs	Controlled trials: RCTs, non-RCTs, single-arm Observational studies: prospective, retrospective, cohort, cross-sectional, case-control, case-series, surveys, interviews
Outcomes	Health utilities/HRQoL of using below instruments: • Direct methods: TTO, SG, VAS • Indirect methods: EQ-5D, SF-36/12/6D, HUI
Time frame	2017 to 2021 Nov.
Other limits	English articles free accessible

Results

- After removing duplicates, 169 citations were identified through databases and grey literature searches.
- Finally, 11 freely available studies were included. Included studies were conducted across China (4), Brazil (1), Ecuador (1), Iran (1), Taiwan (1), Thailand (1), UK (1), and not reported (1).
- The study designs were cross-sectional (7), questionnaires (2), case-control (1), and case series (1). Clinical trials were not identified. Sample size was ranged from two to 1341 across the included studies arms.
- HRQoL reported by using EQ-VAS (4), SF-36 (1), and SF-12v2 (1) and health utilities reported by using EQ-5D (6), SF-6D (1), time trade-off (TTO) (2), and standard gamble (SG) (1) across the studies.
- The mean and median EQ-5D VAS scores ranged from 67.3 to 79.9 and 65 to 75, respectively.
- The mean SF-36 scores of physical functioning and general health were 75.60 and 56.53, respectively.
- The mean SF-12v2 PCS and MCS scores for sight-threatening DR were 41.12 and 52.94, respectively.
- The mean EQ-5D utilities ranged from 0.356 (diabetic bilateral blindness) to 0.971 (unilateral DR); vision-threatening DR (VTDR) has poorer health (0.858 to 0.80) than non-VTDR (0.801 to 0.87).
- The mean SF-6D utilities for sight-threatening DR and NPDR were 0.828 and 0.865, respectively.
- The mean TTO utility value was 0.924 in DR patients; showed increased health in 3-month postoperative cataract surgery (0.72) compared with preoperative (0.58).
- The mean SG utility value was 0.30 in patients with DR.

Table 2: Overview of results from all included studies

Study name	Country	Study design	HRQoL/Utility values
Ben 2020 ³	Brazil	Cross-sectional	EQ-5D, Mean (SD), 95% CI: Non-sight-threatening diabetic retinopathy (Non-STDR): 0.801 (0.21), (0.726 – 0.875) Sight-threatening diabetic retinopathy (STDR): 0.658 (0.25), (0.521 – 0.794) Bilateral blindness: 0.356 (0.21), (0.061 – 0.651) EQVAS, Median (IQR): Non-sight-threatening diabetic retinopathy (Non-STDR): 75 (70-80) Sight-threatening diabetic retinopathy (STDR): 70 (50-80) Bilateral blindness: 65 (50-80)
Fenwick 2020 ⁴	NR	Questionnaire	EQ-5D-3L, Mean: Vision-threatening DR (VTDR): 0.80 Non-vision-threatening DR (non-VTDR): 0.87
Jiao 2017 ⁵	China	Cross-sectional	SF-6D, Mean (SD): Non-proliferative diabetic retinopathy/pre-proliferative diabetic retinopathy: 0.865 ± 0.124 Sight-threatening diabetic retinopathy: 0.828 ± 0.130
Jiao 2017 ⁵	China	Cross-sectional	SF-12v2, Mean (SD): Non-proliferative diabetic retinopathy/pre-proliferative diabetic retinopathy Physical component summary: 45.75 ± 10.28 Mental component summary: 53.89 ± 11.64 Sight-threatening diabetic retinopathy Physical component summary: 41.12 ± 12.24 Mental component summary: 52.94 ± 11.39
Lin 2016 ⁶	Taiwan	Cross-sectional interview-administered survey	Standard gamble (SG), Mean: 0.30
Morjaria 2019 ¹	UK	Case-control	SF-36 Mean (SD): Physical functioning: 75.60 (26.83) General health: 56.53 (22.84)
Pan 2018 ⁷	China	A community-based survey	EQ-5D-5L, Mean (SD): Unilateral DR: 0.971 (0.082) Bilateral DR: 0.970 (0.145)
Romero-Naranjo 2019 ⁸	Ecuador	Cross-sectional	EQ-5D-3L, Mean: 0.77 EQ-5D VAS, Mean: 79.94
Sothornvit 2018 ⁹	Thailand	Cross-sectional	Time tradeoff (TTO), Mean: 0.924 Note: EQ-5D-5L health status was converted to utility value (TTO)
Zare 2020 ¹⁰	Iran	Cross-sectional questionnaire based survey	EQ-5D-5L, Median (IQR): 0.708 (0.178) EQ-5D VAS, Median (IQR): 65 (25)
Zhang 2020 ¹¹	China	Retrospective cross-sectional	EQ-5D-3L, Mean (SD): 0.81 (0.18) EQ-5D VAS, Mean (SD): 67.30 (15.55)
Zhu 2017 ¹²	China	Prospective case series	Time tradeoff (TTO), Mean (SD): Preoperative (cataract surgery): 0.58 ± 0.14 3-month postoperative (cataract surgery): 0.72 ± 0.14

List the abbreviations used in both tables: DR, Diabetic retinopathy; EQ-5D, EuroQol-5 Dimension; HRQoL, Health-related quality of life; HUI, Health utilities index; RCTs, Randomized controlled trials; SD, Standard deviation; SF, Short Form; SG, Standard gamble; STDR, Sight-threatening diabetic retinopathy; TTO, Time trade-off; VAS, Visual analogue scale.

Conclusions

- DR health state is associated with a significant decrement in HRQoL compared to the absence of retinopathy in patients with type 2 diabetes.³
- Research exploring the utility values of different health states associated with DR has provided mixed results.³
- DR severity did not have an impact on sleep quality.¹
- These findings suggest that diabetic retinopathy is associated with poorer quality of life in vision-threatening and bilateral conditions compared with non-VT and unilateral.
- The HRQoL and health preference of diabetic patients without complications were not worse than those of the general healthy population.
- The presence of sight-threatening diabetic retinopathy (STDR) was associated with significantly lower HRQoL and health preference scores.
- Overall, DR has a significant impact on physical mental and general health.

Limitations

- The study was a targeted literature review which limited to only last five years data.
- This review reported only freely available data.

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Authors have no conflict of interest to declare.