

Quality of 'Red' Reflex teaching videos on the Internet for the COVID-19 era – A Cross Sectional Study

Connie Dodds, Sirj Patel, Andrew Blaikie, University of St Andrews, Global Health Team – ab312@st-andrews.ac.uk

Introduction and Aims

The 'red' reflex test (RRT) is important for early diagnosis of childhood eye disease (1). It is however often performed poorly due to inadequate training and access to equipment especially in low resource settings (2).

The visual nature of the technique is suited to online learning which has become increasingly important during the COVID-19 pandemic (3).

The quality of teaching videos on the internet is however currently unknown.

We performed a study to assess the quality of RRT videos and to investigate which search engines performed best in identifying these resources.

Methods

An internet search using three different platforms (YouTube, Google and DuckDuckGo) was conducted using keywords related to RRT.

Predefined inclusion and exclusion criteria enabled a common pool of videos to be analysed. Video evaluation was performed independently by two medical students, one junior ophthalmologist and one senior ophthalmologist thus covering all stages of training.

A Total Quality Score (TQS) was derived from 3 sub-scores; i) Red Reflex Specificity (RRS) + ii) Understandability & Attractiveness (U&A) + iii) Reliability (JAMA). An 'educational usefulness' index, the Global Quality Score (GQS) was also recorded.

Statistical analyses included descriptive, categorical and nonparametric. Dunn Bonferroni was used for two-way intergroup comparison and Spearman's correlation examined video quality with audience interaction parameters. All tests were two sided with significance level = 0.05, where $p < 0.05$ was considered statistically significant.



Figure 1. Red reflex examination technique and appearance.

Table 1. Scoring systems used to assess video quality.

Scoring domain	Total possible score
Red Reflex Specific (RRS)	34
Understandability and Attractiveness (U&A)	12
Reliability (JAMA)	4
Total Quality Score (TQS) ^a	50
Global Quality Score (GQS)	5

Note: ^aTQS = RRS + U&A + JAMA

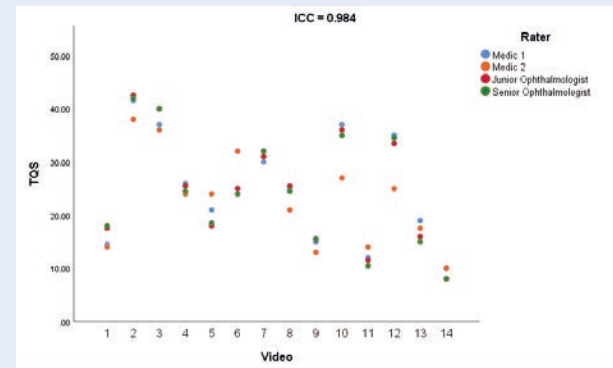


Figure 2. Grouped scatter plot of Total Quality Score (TQS) of videos.

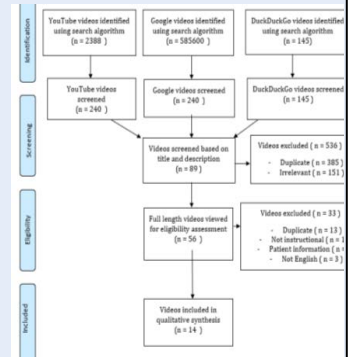
Results

588,133 videos were identified on initial search, of which 625 were screened. Fourteen then met the inclusion criteria for detailed study.

Overall, videos had a mean TQS of 24.3/50 (range 9-41) with only six videos being considered 'educationally useful' using the GQS.

The principal video source was physicians (43%) with videos uploaded by academics being of greatest overall quality ($p=0.023$).

There was a positive correlation between TQS and ranking position of videos using Google ($r=0.569$, $p=0.034$) but not with other platforms. Concordance of scoring by individual assessors was confirmed by grouped scatter plot, with an intraclass correlation coefficient (ICC) of 0.984. (Figure 2)



Conclusions

This study showed that the small number of instructional videos currently available online are generally poor and of variable quality. For medical education in the COVID-19 era to be successful there is a clear need for open access sites to host better quality educational material.

Where videos are incorporated into curriculum, users should seek resource of academic origin as this source offers more reliable and higher quality videos.

Search engines do not necessarily optimise identification of the best videos. Google however did perform the best with a statistical association between quality and search rank placement.. These results can inform development of future online teaching material and how best to access it.

References:

1. Subhi Y, Schmidt DC, Al-Bakri M, Bach-Holm D, Kessel L. Diagnostic Test Accuracy of the Red Reflex Test for Ocular Pathology in Infants: A Meta-analysis. JAMA Ophthalmology. 2021;139(1):33-40.
2. Ademola-Popoola DS, Opocher E, Reddy MA. Contemporary management of retinoblastoma in the context of a low-resource country. Niger Postgrad Med J. 2019;26(2):69-79.
3. Wijesooriya NR, Mishra V, Brand PLP, Rubin BK. COVID-19 and telehealth, education, and research adaptations. Paediatric Respiratory Reviews. 2020;35:38-42.