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[Intervention Review]

Assistive technology for children and young people with low vision

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ABSTRACT

Background

Recent technological developments, such as the near universal spread of mobile phones and portable computers and improvements in the accessibility features of these devices, give children and young people with low vision greater independent access to information. Some electronic technologies, such as closed circuit TV, are well established low vision aids and newer versions, such as electronic readers or off-the shelf tablet computers, may offer similar functionalities with easier portability and at lower cost.

Objectives

To assess the effect of electronic assistive technologies on reading, educational outcomes and quality of life in children and young people with low vision.

Search methods

We searched CENTRAL (which contains the Cochrane Eyes and Vision Group Trials Register) (2014, Issue 9), Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid MEDLINE Daily, Ovid OLDMEDLINE (January 1946 to October 2014), EMBASE (January 1980 to October 2014), the Health Technology Assessment Programme (HTA) (www.hta.ac.uk/), the metaRegister of Controlled Trials (mRCT) (www.controlled-trials.com), ClinicalTrials.gov (www.clinicaltrials.gov) and the World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (www.who.int/ictip/search/en). We did not use any date or language restrictions in the electronic searches for trials. We last searched the electronic databases on 30 October 2014.

Selection criteria

We intended to include randomised controlled trials (RCTs) and quasi-RCTs in this review. We planned to include trials involving children between the ages of 5 and 16 years with low vision as defined by, or equivalent to, the WHO 1992 definition of low vision. We planned to include studies that explore the use of assistive technologies (ATs). These could include all types of closed circuit television/electronic vision enhancement systems (CCTV/EVES), computer technology including tablet computers and adaptive technologies such as screen readers, screen magnification and optical character recognition (OCR). We intended to compare the use of ATs with standard optical aids, which include distance refractive correction (with appropriate near addition for aphakic (no lens)/pseudophakic (with lens implant) patients) and monocular/binoculars for distance and brightfield magnifiers for near. We also planned to include studies that compare different types of ATs with each other, without or in addition to conventional optical aids, and those that compare ATs given with or without instructions for use.

Data collection and analysis

Independently, two review authors reviewed titles and abstracts for eligibility. They divided studies into categories to 'definitely include', 'definitely exclude' and 'possibly include', and the same two authors made final judgements about inclusion/exclusion by obtaining full-text copies of the studies in the 'possibly include' category.

Main results

We did not identify any randomised controlled trials in this subject area.

Authors' conclusions

High-quality evidence about the usefulness of electronic AT for children and young people with visual impairment is needed to inform the choice healthcare and education providers and family have to make when selecting a technology. Randomised controlled trials are needed to assess the impact of AT. Research protocols should carefully select outcomes relevant not only to the scientific community, but more importantly to families and teachers. Functional outcomes such as reading accuracy, comprehension and speed should be recorded, as well as the impact of AT on independent learning and quality of life.

PLAIN LANGUAGE SUMMARY

Assistive technology (electronic aids) for children and young people with low vision

Review question

To assess the effect of electronic aids on reading, educational outcomes and quality of life in children and young people with low vision, also called 'being partially sighted' or 'having a sight impairment'.

Background

New technologies that are widely available to young people, such as mobile phones and portable computers, often have accessibility features for users with visual or other impairments. Families and teachers have observed that children and young people use the magnifier functions to enlarge text or pictures, and also often use these devices to find information more independently. Electronic devices also seem more socially acceptable to children and young people, who often fear to 'stand out' from their peers when using bulky optical aids.

Research is needed to find out whether children and young people with low vision really can use these 'assistive technologies' successfully at school and at home, and whether these technologies improve their participation in education. Electronic aids should allow the young person to read more independently, faster and more accurately than without aids, and it should be easy to take the devices from one classroom to the next. How much an electronic technology is used on a daily basis is also a good indicator of how well it works for the young person.

This Cochrane Review aims to assess the effect of assistive technologies on reading, educational outcomes and quality of life in children and young people with low vision. We searched the published literature and registers of current clinical trials. We did not identify any high-quality research studies in this subject area. Possible reasons are that these technologies are still new, and also that traditionally low-vision research was carried out as 'before/after' studies, not as trials where participants are allocated to treatments on a random basis, which is the best way of making sure that any observed effects can be attributed to treatment, rather than other factors.

Worldwide there are an estimated three million children and young people with low vision. Families and healthcare and education providers need high-quality evidence to inform the choice of technology for a child or young person with low vision. Future research should measure functional outcomes, such as reading accuracy, comprehension and speed, as well as the impact of assistive technologies on independent learning and quality of life, and outcomes relevant to families and teachers.

Search date

The evidence is up to date to October 2014.