Low vision service outcomes: a systematic review

EXECUTIVE SUMMARY

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This review has been prepared for the RNIB as part of the Low Vision Service Model Evaluation (LOVSME) project.
1 Executive Summary

Visual impairment is a global concern, which is likely to become more significant, on a social, economic and personal level, as the standard of medical care improves, and the average lifespan increases. Low vision rehabilitation aims to improve functional ability, and possibly wider aspects, such as quality of life and psychosocial status, in those with visual impairment. Different service models have been developed to meet these goals, and there is need for a strong evidence base regarding the ability of these different strategies to achieve positive outcomes in various patient groups. This report is a systematic review of the literature on the effectiveness of different models of vision rehabilitation.

The primary objective of the review was to assess the effects of low vision service provision on rehabilitation outcomes in people with a visual impairment.

Secondary objectives:

1) To assess the relative effects of different service models on rehabilitation outcomes in people with a visual impairment.

2) To assess the impact of timing of outcome assessment on rehabilitation outcomes in people with a visual impairment.

3) To assess the evidence for a dose effect on rehabilitation outcomes in people with a visual impairment.

4) To assess the effect of low vision service provision on special groups of service users, e.g. people with learning disabilities, children and people of working age.

5) To assess the costs associated with low vision service provision.

Literature was identified by searching the following databases: Web of Science, EMBASE, Medline, Cochrane CENTRAL, PsychINFO, and CRD databases. Additional literature was identified via hand searching of relevant reviews [82, 115, 131-134], and by asking experts in the field for additional sources of information.
Of 7,800 potential articles identified by the literature searching strategies, forty-six of the studies were found to be relevant to the general effectiveness of low vision services, 4 were relevant to children and minority groups, and 2 were relevant to the cost-effectiveness of low vision services.

The findings of the report were as follows:

1.1 Quality of Evidence

Whilst there have been many publications on low vision rehabilitation outcomes the quality of these reports has not always been good. That is, many studies fail to report in sufficient detail the study design, the nature of the intervention or indeed their findings (e.g. “p values” are reported but no data is presented). In addition, few studies control for any underlying deterioration in visual function during the follow-up period, which may have masked benefits associated with the rehabilitation.

There is only 1 waiting list controlled randomised controlled trial of low vision service outcomes. There are 2 randomised low vision service comparison trials [75, 86-88] and 1 low quality randomised rehabilitation training comparison trial [142]. Because of the absence of high quality evidence (RCT) this review also included other types of study (e.g. ‘before and after comparisons’) but we excluded those having the weakest study design (i.e. ‘case reports’ and ‘case series’).

In this review we use the terms: ‘very good evidence’ when referring to the results of well designed randomised controlled trials; ‘good evidence’ when referring to consistent results from at least two robust studies that are not randomised controlled trials and ‘evidence’ when referring to the results from at least one robust study.

1.2 Does rehabilitation improve outcomes for service users?

The results reported by studies are dependent on: 1) the nature of the rehabilitation programme (content and dose), 2) the outcome measures used (larger effects are observed with functional ability measures, smaller effects with QOL measures), 3) the characteristics of the people studied, 4) when outcomes are measured, 5) study methodology.
There is good evidence that low vision rehabilitation has a large effect on clinical reading ability (size of print read and reading speed) e.g. [70, 94, 96, 97, 145].

There is good evidence that low vision aids provided by rehabilitation services are valued by service users and used at home e.g.[75, 79]

There is very good evidence that Veterans’ Affairs rehabilitation programmes (both inpatient and outpatient) have a very large positive effect on self reported functional ability e.g. [61, 121, 130].

There is evidence that other rehabilitation programmes have a medium effect on functional ability e.g. [122].

There is contradictory evidence about the ability of rehabilitation programmes to improve “vision related quality-of-life”. For example, whilst Kuyk et al (2008) and Stelmack et al., 2002 showed medium/small effects from the inpatient Veterans’ Affairs rehabilitation programme [90] and Scott et al, (1999) showed a medium effect for a more modest programme (60-90 min) [147], Lamoureux et al, (2007) showed only a small effect [58] and DeBoer et al, (2006) and Reeves et al, (2004) no change (before – after) [75, 83].

There is no evidence that even the comprehensive Veterans’ Affairs rehabilitation programme can improve generic health related quality-of-life (e.g. SF-36) [61]. Similarly, less intense, multidisciplinary rehabilitation programmes and hospital based programmes have been unable to demonstrate a positive effect on the SF-36 and its derivatives e.g.[58, 75, 147].

Despite reports of small improvements in mood / reduction in depression after low vision service intervention e.g. [42, 100, 150], there is no evidence that an intensive rehabilitation programme can reduce depressive symptoms [61]. However, there is some evidence that “Independent Living Programmes” and group instruction in “Adaptive Skills Training” can have a small to medium effect on adjustment to visual loss respectively [64, 69].
1.3 Is there evidence that some services are better than others?
A well conducted study provided no evidence that “enhanced” services were better at improving vision related quality-of-life than good hospital services [75]. And, there is no evidence that multidisciplinary services are better at improving vision related quality-of-life than optometric services [83, 129]. However, there is evidence that a group based “problem solving health education programme” is more effective than an “individual intervention” [86-88].

1.4 Do rehabilitation outcomes deteriorate with time?
Only a few studies have followed rehabilitation outcomes over time. Effects at 2 months are slightly larger than at 6 months [90] and effects at 3 months are larger than at 12 months [130]. There is some evidence that the effects of intense programmes (e.g. Veterans’ Affairs Hines) ‘wash out’ at 3 years [72], although caution is needed because of the significant number of participants ‘lost to follow up’. However, the decline in outcomes with time is not a universal finding. For example, there is evidence that positive outcomes reported for ADLs following a “problem solving skills” based health education programme do not deteriorate over 28 months [86-88].

1.5 Is more rehabilitation better?
There is conflicting evidence regarding a ‘dose effect’. For example, Stelmack et al, (2006) found a very large effect using the VA LV VFQ-48 following an intensive inpatient Veterans’ Affairs rehabilitation programme (42 days) but only a small effect following a Veterans’ Affairs outpatient programme (2-4 visits) [121]. The larger effects reported in the literature tend to come from intensive rehabilitation programmes e.g. [61, 148], however, other studies have shown that it is possible to obtain a medium or large effect size with a relatively low dose intervention [70, 122].

1.6 Studies on children, those of working age and minority groups
There is very little evidence on rehabilitation outcomes in children. The only evidence relates to reading ability and use of aids [68, 156].
Most studies only involve older adults, and many of the more robust studies only older males (e.g. from Veterans’ Affairs rehabilitation
programmes). Although several studies include ‘people of working age’ there are no specific studies on this group of people. There is no evidence on outcomes in ethnic minority groups or those with learning disabilities.

1.7 How cost-effective is low vision service provision?

When considering the wider question of the ability of interventions to deliver a cost effective service to people with low vision, little evidence was found. The available evidence was of a variable quality. Only 2 relevant studies were identified and both recruited older people rather than the wider population of people with low vision [140, 141]. Eklund et al (2005) demonstrated a Health Education Programme delivered in groups was less costly than individual treatment [140]. Another study showed that in-patient rehabilitation was more costly and more effective than out-patient rehabilitation [141]. Neither study included incremental cost effectiveness ratios, therefore it is not possible to conclude that either were cost effective. We were unable to find any economic evaluations that included children with low vision.

Estimation of cost-effectiveness is essential to support decision makers, such as NICE, to make recommendations for resource allocation. This requirement becomes increasingly important for an aging population and in times of financial constraint. A significant problem in determining an economic case is the lack of effectiveness evidence; and of the data that does exist, even less is reported in a form that lends itself to inclusion in an economic model which could demonstrate cost-effectiveness.

There is a need to investigate whether integrated low vision services lead to improved, cost effective outcomes for people with low vision.

In summary this literature review shows:

• There is a lack of high quality evidence to support the effectiveness of low vision service provision.

• The majority of studies use a relatively weak ‘before and after’ comparison design, many do not provide a full description of the intervention studied and results are not always reported in full.
• There has been little agreement about how best to measure outcomes and this frustrates study comparisons.

• Low vision aids improve reading ability and are valued by service users.

• Well resourced rehabilitation programmes (e.g. Veterans Affairs programmes in USA) can produce large improvements in ‘functional ability’ but there is no evidence that they improve ‘generic health related quality-of-life’.

• There is contradictory evidence about the ability of services to improve ‘vision related quality-of-life’.

• Despite several reports of small improvements in mood following low vision rehabilitation there is no evidence that even the well resourced Veterans Affairs programme can reduce depressive symptoms in its client group. However, other types of programme such as “Independent Living Programmes” and “Adaptive Skills Training” may help people ‘adjust’ to vision loss.

• There is no evidence that ‘enhanced’ services are better at improving ‘vision related quality of life’ than ‘standard’ hospital based services in the UK.

• There is no evidence that ‘multidisciplinary services’ are better at improving vision related quality of life than ‘optometric services’ in Holland.

• There is evidence that a ‘group based health education programme’ is more effective than an ‘individual intervention’.

• There is some evidence that rehabilitation outcomes peak at around 2-3 months and decline thereafter but this is not a universal finding.

• There is some evidence that rehabilitation outcomes are better following more intense rehabilitation programmes but, the optimum ‘dose’ has not yet been established.
There is very little information about rehabilitation outcomes in children and none about outcomes in those of ‘working age’ and in minority groups.

Only 2 studies are directly relevant to the cost of low vision rehabilitation but it is not possible to conclude that the programmes studied were cost effective.

Robust research methods and high quality reporting are necessary to advance our understanding of how rehabilitation services can best help people with a visual impairment.

Copies of the full systematic review may be obtained from RNIB or Tom Margrain, the corresponding author at, the Cardiff School of Optometry and Vision Sciences, Cardiff University, Cardiff, Wales.
Appendix 1: Abridged reference list


Appendix 2: Affiliations

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