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Self-management interventions for quality of life in adults with visual impairment (Review)

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[Intervention Review]

Self-management interventions for quality of life in adults with visual impairment

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ABSTRACT

Rationale

Visual impairment is a major health concern that predominantly impacts older adults due to age-related ocular diseases. Visual impairment affects more than 2200 million people worldwide and may lead to functional and psychological decline, emphasizing the need for effective self-management interventions. Self-management interventions aim to enhance individuals' abilities to manage their condition, maintain activities of daily living, and improve overall well-being.

Objectives

To assess the effects of self-management interventions on quality of life in adults with visual impairment compared with inactive or active (usual care) control interventions.

Search methods

We searched CENTRAL, MEDLINE, Embase, two other databases, and two trial registries, together with reference checking and contact with study authors to identify studies that are included in the review. The latest search date was on 19 May 2024.

Eligibility criteria

We included parallel-group randomized controlled trials (RCTs) comparing multifaceted self-management interventions in adults with acquired visual impairment (including dual sensory impairment).

Outcomes

Outcomes assessed were overall and subscores of health-related quality of life (HRQoL) and vision-related quality of life (VRQoL) scores at the end of follow-up, adverse events during the study period, and vision-related living performance measures at the end of follow-up.

Risk of bias

We assessed the risk of bias for three outcomes reported in a summary of findings table using the Cochrane RoB 2 tool.

Synthesis methods

We synthesized results for each outcome using meta-analysis where possible, by calculating standardized mean difference (SMD) or mean difference (MD) with 95% confidence interval (CI) for continuous outcomes and risk ratio (RR) with 95% CIs for dichotomous outcomes. Where this was not possible due to the nature of the data, we provided a narrative summary of the results. We used GRADE to assess certainty of evidence for prespecified outcomes.

Included studies

We included 20 parallel-group RCTs that enrolled 3151 participants. The size of studies ranged from 30 to 323 participants with a median of 153 participants. Studies were conducted in Asia (two studies), Australia (two), Europe (six), and North America (10) in academic medical centers, hospitals, low-vision clinics, private practice, rehabilitation centers, and Veterans Affairs medical facilities. The participants were older adults with a mean age across the included studies ranging from 60 to 84 years. The mean logarithm of the minimum angle of resolution (logMAR) visual acuity ranged from 0.15 to 1.11. Age-related macular degeneration was the predominant cause of low vision in 15 studies. We did not identify any eligible studies for adults with dual sensory impairment. One study was funded by industry, whereas others received a research grant or support from a non-profit organization or foundation.

Multifaceted self-management interventions included in this review were diverse. The control group was placed on a wait list, while other active controls included usual care, optical aids, or low-vision rehabilitation.

Synthesis of results

We rated the overall risk of bias of included studies as low or some concerns.

The meta-analysis revealed consistent findings across different outcomes and comparisons. For HRQoL, evidence suggests that self-management intervention may result in little to no difference in HRQoL (change score: SMD -0.09, 95% CI -0.33 to 0.15; $I^2 = 46\%$; 3 studies, 568 participants; final value: SMD -0.15, 95% CI -0.38 to 0.08; $I^2 = 31\%$; 3 studies, 459 participants; low-certainty evidence). This finding remained consistent regardless of whether wait list or active control was the comparator.

For VRQoL, multifaceted self-management interventions may result in little to no difference in VRQoL change score compared to active control (SMD -0.12, 95% CI -0.33 to 0.10; $I^2 = 48\%$; 4 studies, 733 participants; low-certainty evidence). The evidence from six studies by final values suggests that self-management intervention may not improve VRQoL compared to control treatment in the longer-term (6 to 24 months) (SMD -0.01, 95% CI -0.14 to 0.13; $I^2 = 0\%$; 6 studies, 864 participants; low-certainty evidence). The conclusion was unchanged, irrespective of the comparator used.

We judged the certainty of evidence for both HRQoL and VRQoL as low according to GRADE criteria, downgrading one level for imprecision and one level for unexplained heterogeneity.

For harms, self-management interventions may not affect the risk of adverse events (RR 1.14, 95% CI 0.78 to 1.66; $I^2 = 0\%$; 2 studies, 255 participants; low-certainty evidence). Of four studies that reported adverse events, three studies observed no treatment-related adverse events. One study referred 12 (34%) participants to the general medical practitioner for depressive symptoms in the intervention group compared with seven (22%) participants in the wait list comparison group.

Authors' conclusions

In this review, we found low-certainty evidence that multifaceted self-management interventions have little or no effects on improving HRQoL and VRQoL for adults with visual impairment. Research is needed to develop more sensitive measures of quality of life and to assess the benefit of such interventions across a broader demographic, including different stages of vision impairment and people with dual-sensory impairment.

Funding

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Registration

Protocol available via doi.org/10.1002/14651858.CD015790.

PLAIN LANGUAGE SUMMARY

Can self-management programs improve the quality of life in adults with low vision?

Key messages

- Self-management programs (types of education or training that help people learn how to manage their own health) may not improve health-related or vision-related quality of life measures in adults with low vision.
- The evidence is uncertain, and more research is needed to confirm these findings.

What is visual impairment?

Visual impairment refers to a condition where a person's eyesight is reduced and cannot be corrected using eye glasses, contact lenses, or surgery. This leads to difficulties in seeing or interpreting visual information. This impairment can range from partial sight to total blindness, and may result from various causes such as eye diseases, injuries, or congenital conditions (birth defects). Individuals with visual impairment often rely on alternative methods to navigate their surroundings and access information effectively.

How is visual impairment treated?

Treatment for visual impairment varies depending on the underlying cause and severity of the condition. For conditions where eye glasses or contact lenses do not improve vision to a functional level, rehabilitation programs offer support and training to help individuals with visual impairment adapt to their condition, learn new skills, and utilize assistive technologies (products or systems that support and assist) effectively for daily tasks and activities. These learned skills and techniques empower individuals to manage their health conditions effectively.

Why is this important?

Visual impairment can impact an individual's quality of life, affecting their ability to perform daily activities, maintain social connections, and enjoy life. Self-management programs may potentially help individuals adapt to vision loss and improve their well-being.

What did we want to find out?

We wanted to find out whether self-management training is better than usual care for people with low vision.

What did we do?

We searched for studies that compared self-management programs with usual care or no program. We compared and summarized the results of these studies and rated our confidence in the evidence for quality of life and other measures based on factors such as study method and size.

What did we find?

We included 20 studies with 3151 participants in our review. The studies varied greatly in the type of self-management programs they used and the outcomes they measured. Overall, we found that self-management programs may have little to no impact on improving the health-related and vision-related quality of life for adults with visual impairment. Out of four studies that looked at harms, three found no unwanted events related to the treatment. In one small study, however, 12 people (equaling about 34 people out of 100) in the self-management group and seven people (equaling about 22 people out of 100) in the comparison group had to see a doctor for symptoms of depression.

What are the limitations of the evidence?

We have little confidence in the evidence, because there are not enough studies to be certain about the results, and not all studies provided data about everything we were interested in.

How up to date is this evidence?

The evidence is current to May 2024.

SUMMARY OF FINDINGS

Summary of findings 1. Self-management interventions for quality of life in adults with visual impairment

Self-management interventions for quality of life in adults with visual impairment

Population: adults with low vision

Setting: academic medical centers, hospitals, private practice, low-vision clinics, Veterans Affairs medical facilities, and rehabilitation centers

Intervention: multifaceted self-management intervention

Comparison: wait list or active comparator

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	Number of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Assumed risk (wait list or active comparator)	Corresponding risk (multifaceted self-management intervention)				
HRQoL at the end of follow-up Higher value favors self-management intervention	Change score: SMD** -0.09 (favors control) (95% CI -0.33 to 0.15)			3 (568)	⊕⊕⊕⊖ Low^a	—
	Final value: SMD** -0.15 (favors control) (95% CI -0.38 to 0.08)			3 (459)		
VRQoL at the end of follow-up Higher value favor to self-management intervention	Change score: SMD** -0.12 (favors control) (95% CI -0.33 to 0.10)			4 (733)	⊕⊕⊕⊖ Low^a	The results reported by change score from 2 studies using wait-list control were not pooled due to considerable heterogeneity ($I^2 = 96\%$): Brody 2002 (SMD 0.13, 95% CI -0.14 to 0.40; 231 participants), Stelmack 2008 (SMD 2.55, 95% CI 2.08 to 3.02; 126 participants).
	Final value: SMD** -0.01 (favors control) (95% CI -0.14 to 0.13)			6 (864)		
Any adverse events during the study period	28 per 1000	32 per 1000 (22 to 46)	RR 1.14 (0.78 to 1.66)	255 (2)	⊕⊕⊕⊖ Low^b	In Acton 2016, 12 (34%) in the intervention group versus 7 (22%) in the control group were referred to the general practitioner for depres-

sive symptoms. There were no treatment-related adverse events in 3 studies.

***The risk in the intervention group** (and its 95% CI) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

****0.2** represents a small effect, **0.5** represents a moderate effect and **0.8** represents a large effect according to Cohen's effect sizes.

CI: confidence interval; **HRQoL:** health-related quality of life; **SMD:** standardized mean difference; **RR:** risk ratio; **VRQoL:** vision-related quality of life.

GRADE Working Group grades of evidence

High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.

Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.

Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.

Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

^a Downgraded one level due to imprecision and one level for inconsistency due to different directions of point estimates across studies.

^b Downgraded two levels due to imprecision.

BACKGROUND

According to the World Health Organization, at least 2200 million people are affected by visual impairment globally [1]. Visual impairment is one of the leading causes of disability, posing a significant financial burden on healthcare systems across the globe [2]. While vision loss can affect people of all ages, the majority of those with visual impairment are over the age of 50 years with age-related ocular disease. The number of individuals affected by visual impairment is expected to exponentially increase as the population ages [3].

The main causes of visual impairment are uncorrected refractive error, cataract, macular degeneration, glaucoma, and diabetic retinopathy [4]. In most cases, these conditions are progressive in nature, which may lead to functional impairment in activities of daily living and loss of independence and quality of life.

Visually impaired adults are more likely to be older, unemployed, and have lower income [5]. In addition, visual impairment is associated with a higher risk of mortality, as a decline in functional ability in instrumental activities of daily living is experienced [6].

Description of the condition

There are many definitions for visual impairment. In this review, we used the definition determined by the International Classification of Diseases 11, which states: "A vision impairment results when an eye condition affects the visual system and one or more of its vision functions. Typically, population-based surveys measure visual impairment using exclusively visual acuity, with severity categorized as mild, moderate, or severe distance vision impairment or blindness, and near vision impairment. However, in the clinical setting, other visual functions are also often assessed, such as a person's field of vision, contrast sensitivity and color vision" [7]. This definition is consistent with previous studies in the literature, and it is broad enough to ensure that the review will capture the majority of people with visual impairment.

Description of the intervention and how it might work

Self-management is defined in various sectors of healthcare as the support provided to people with one or more chronic medical conditions which enables and empowers them to play an active role in managing their own health on a day-to-day basis [8, 9]. Interventions to promote self-management may also increase an individual's ability to solve problems, make decisions, and develop action plans for specific goals.

In this review, we defined self-management as providing the skills and resources for an individual with visual impairment to cope with their visual disability and manage their condition and psychological well-being. Self-management interventions can be delivered individually or in groups by a variety of healthcare professionals, and include the multifaceted aspects of knowledge acquisition and skills development that allow individuals to better manage their condition, and thereby optimize their health and well-being [8]. People with low vision may receive recommendations from their low-vision specialist for ways that they can engage in self-management. They may also encounter these types of strategies through support groups or other educational programs. By evaluating self-management strategies in vision impairment, we may expect to see an improvement in visual functioning and

independence, therefore enhancing the quality of life of people with vision impairment.

Why it is important to do this review

This review is important to determine how quality of life is affected by self-management interventions to improve the psychological well-being, economic, and cognitive burdens on those affected by visual impairment [10]. This study is important for vision health professionals to better understand the most effective self-management intervention for visually impaired people, so that we can provide more effective care. Currently, there are scarcely any published systematic reviews that use quality of life as a metric; therefore, this is an important metric that needs to be considered. Additionally, this metric is of importance due to the growing interest of governments and health insurance companies in assessing quality of life as an outcome measure.

OBJECTIVES

To assess the effects of self-management interventions on quality of life in adults with visual impairment compared with inactive or active (usual care) control interventions.

METHODS

Since we included a small number of studies in each analysis, we did not categorize outcomes as short-term (up to six months after baseline) or long-term (more than six months after baseline) as prespecified in the protocol [11]. Instead, we reported the data at the end of the follow-up period and detailed the time point in the analyses. We reported self-efficacy and adaptation to vision loss additionally as subscores in health-related quality of life (HRQoL) and vision-related quality of life (VRQoL). Otherwise, we conducted this review in accordance with the published protocol [11]. We followed the Methodological Expectations of Cochrane Intervention Reviews (MECIR) standards for the reporting of new Cochrane intervention reviews in conducting this review and followed the PRISMA 2020 in reporting our findings [12].

Criteria for considering studies for this review

Types of studies

We included randomized controlled trials (RCTs) evaluating multifaceted self-management interventions for individuals with visual impairment compared with inactive interventions or usual care. Cluster-RCTs and quasi-RCTs were also eligible for inclusion, although we did not identify such designs in this review. We excluded cross-over RCTs because self-management intervention can lead to permanent or long-term modification to participants, and carry-over effect cannot be ignored. We did not exclude studies on the basis of publication status or language of publication.

Types of participants

We included studies with adults utilizing multifaceted self-management therapies for acquired visual impairment, including dual sensory impairment. There were no limits on etiology or onset of diagnosis. We excluded people less than 18 years of age and those with congenital forms of visual impairment. When both congenital and acquired forms of visual impairments were included in a primary study, we planned to include the study only when there were separate data available for participants with acquired

visual impairment. However, we did not identify such studies in this review.

Types of interventions

We included self-management interventions which had multiple components to enhance visual function and improve patient-reported outcomes secondary to visual impairment. The intervention, which could have been delivered to an individual or group, must have contained at least two of the following components: problem-solving, goal-setting, decision-making, self-monitoring, coping with the condition, an alternative method designed to facilitate behavior change and improvements in physical and psychological functioning, and skills development. There was no minimum time frame for the duration of the intervention.

The self-management interventions may have included the following.

- Education-based approach to participants or caregivers, or both
- Psychological support — professional/family/friends
- Interventions promoting greater usage of low-vision aids, such as:
 - magnifiers
 - reading glasses
 - video magnifiers
 - screen readers
 - assistive technology
- Occupational therapy
 - Behavioral activation
 - Home management
- Enhancement of problem-solving skills
- Behavioral skills planning
- Goal planning

Self-management interventions as defined here do not include training through telerehabilitation or interventions delivered to those in residential facilities.

Outcome measures

We define health-related quality of life (HRQoL) as an individual or a group's perceived physical, mental, and social health over time [13]. HRQoL measures are used to represent the qualitative experience with a disease pre- and postintervention. Generic HRQoL measures are not always sensitive to vision-specific functionality, thus research in this population can include vision-related quality of life (VRQoL) measures to capture the complex trait that encompasses visual functioning, symptoms, psychological well-being, social relationships, and concerns that are specific to vision loss [14]. These vision-specific domains may not be adequately represented in an overall measure; therefore, we applied both HRQoL and VRQoL in our review.

Critical outcomes

- **Mean change in overall HRQoL scores**
- **Mean change in overall VRQoL scores** at the end of follow-up
- **Proportion of participants who experienced any adverse events** during the intervention period

We evaluated studies that assessed quality of life using validated questionnaires that were completed by the person affected, a caregiver, or a close relative [15]. Examples of quality of life questionnaires are listed below.

- Visual function (Activity Inventory [16], Veterans Affairs Low-Vision Visual Functioning Questionnaire-48 (VA LV VFQ-48) [17], Impact on Vision Impairment (IVI) [18])
- VRQoL (Low Vision Quality-of-Life Questionnaire (LVQOL) [19], National Eye Institute Visual Function Questionnaire-25 (NEI VFQ-25) [20])
- Psychological well-being (Geriatric Depression Scale (GDS) [21], Patient Health Questionnaire-9 (PHQ-9) [22], General Anxiety Disorder-7 (GAD-7) [23])
- Health-related quality of life (36-item Short Form Health Survey (SF-36) version 2 [24], EQ-5D [25])

Important outcomes

We assessed the following important outcomes reported at the longest follow-up time of the study.

- **Mean change in subscores in HRQoL and VRQoL** including:
 - psychological well-being, emotional distress, feelings of depression or anxiety (or both);
 - physical functioning;
 - self-efficacy; and
 - adaptation to vision loss.

If quality of life measures included only a single domain, we used overall scores as subscores.

- **Mean change in vision-related living performance** measures from baseline:
 - reading speed;
 - Timed Instrumental Activities of Daily Living [26];
 - tracing speed;
 - facial recognition;
 - mobility outcomes.

Search methods for identification of studies

Electronic searches

The Cochrane Eyes and Vision Information Specialist searched the following electronic databases for RCTs: Cochrane Central Register of Controlled Trials (CENTRAL) (which contains the Cochrane Eyes and Vision Trials Register) (Issue 5, 2024), Ovid MEDLINE (All) (January 1946 to 19 May 2024), Embase.com (January 1947 to 19 May 2024), PubMed (1946 to 19 May 2024), Latin American and Caribbean Health Sciences Literature Database (LILACS) (1982 to 19 May 2024), ClinicalTrials.gov (www.clinicaltrials.gov), and the World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (trialsearch.who.int/). We did not use any date or language restrictions in the electronic search for trials.

See: [Supplementary material 1](#) for details of search strategies.

Searching other resources

We searched the reference lists of included studies and contacted study authors to identify additional trials. We did not search for conference abstracts for this review.

Data collection and analysis

Selection of studies

After removal of duplicates, two review authors independently screened the titles and abstracts of all records identified by the searches using Covidence software [27]. We classified each record as 'relevant,' 'possibly relevant,' or 'not relevant' based on the eligibility criteria. We obtained full-text copies of all relevant or possibly relevant studies, and assessed these according to the [Criteria for considering studies for this review](#). Two review authors independently evaluated the full-text articles for inclusion in the review. We merged multiple reports published on the same primary study. A third review author resolved any disagreements or discrepancies between the two review authors at each stage of screening through discussion and consensus.

For studies identified in trial registries that had either been completed before December 2016 or had not been updated since December 2016 or earlier, we contacted the study investigators to collect any relevant published or unpublished data and enquire about the status of studies. We made an ad hoc decision to exclude studies when we were unable to locate any associated publications and received no response from the investigators within one month. This decision was based on the rationale that, given the significant time elapsed since registration, it was unlikely that the studies would have relevant publications or any updates regarding the status of these studies.

Data extraction and management

Two review authors independently extracted data from the included studies using the data extraction form developed by Cochrane Eyes and Vision US Project (CEV@US) in Covidence [27]. We extracted the following information.

- Study design and unit of allocation
- Participants (inclusion/exclusion criteria, number randomized, participant characteristics, withdrawals, and exclusions)
- Self-management intervention(s), including location, personnel delivering the intervention, delivery method and duration
- Outcomes (including time points measured)

We collected data in sufficient detail to facilitate description of the included studies, construct tables and figures, assess risk of bias, and conduct synthesis.

We contacted study authors to request missing information or for clarification. If the authors did not respond within two weeks, we proceeded with the available information. In case of any discrepancies in data extraction between review authors, we reached consensus through discussion or adjudication with an additional review author if necessary. After we reached consensus, one review author exported the collated data in Review Manager [28], and other review authors verified the data entry.

Risk of bias assessment in included studies

Two review authors independently assessed risk of bias for the critical outcomes, mean change in overall HRQoL, mean change in overall VRQoL scores, and proportion of participants who experienced any adverse events using Cochrane's RoB 2 Excel tool [29], as described in Chapter 8 of the *Cochrane Handbook for Systematic Reviews of Interventions* [30]. We assessed the effect

of assignment to the intervention. In case of disagreement, an adjudicator resolved the discrepancy.

We considered the following domains of bias.

- Bias arising from the randomization process
- Bias introduced by deviations from intended interventions
- Bias arising from missing outcome data
- Bias in measurement of the outcome
- Bias in selection of the reported result

We presented an overall risk of bias assessment for each trial based on the assessments across the five domains. The overall judgment was generated using the algorithms in the RoB 2 tool. The overall risk of bias had three categories: 'low risk of bias,' 'high risk of bias,' or 'some concerns.'

Measures of treatment effect

We conducted data analysis following the guidance in Chapter 6 of the *Cochrane Handbook for Systematic Reviews of Interventions* [31]. For the data on the quality of life questionnaire, we collected the data separately as a total score (mean and standard deviation (SD)) and as the subscores on the questionnaire.

We summarized the results as mean difference (MD) with 95% confidence intervals (CIs) where studies used the same measurement tool across studies. Alternatively, we used the standardized mean difference (SMD) with 95% CIs where studies employed different tools. We separately analyzed the change score and final value to calculate SMD. We interpreted SMD according to Cohen's effect sizes, where 0.2 represents a small effect, 0.5 represents a moderate effect, and 0.8 represents a large effect. We expressed point estimates for dichotomous outcomes (e.g. adverse events) as risk ratio (RR) with 95% CIs [32].

Where it was not possible to summarize the results as above, we provided a narrative summary of the results.

Unit of analysis issues

The unit of analysis in all included studies, for critical and other important outcomes, was the participant.

Dealing with missing data

When data were missing from a paper or difficult to interpret, we contacted the study authors to request further information. When the study investigators did not respond within two weeks, we proceeded with the available information and assessed the impact of the missing data on the overall interpretation of results. When studies did not provide precision measures (e.g. SDs), we imputed them using the information from the studies (e.g. CIs and exact P values) [33]. Additionally, when data were missing and we were unable to contact the study authors, we utilized data from the van Nispen Cochrane review for our analyses as specified in the footnotes of the relevant sections [34].

Reporting bias assessment

We examined the risk of reporting bias by comparing the outcomes defined in the trial protocol or trial registry with those presented in the full-text publication/report of the study according to the signaling questions in the relevant domain of the RoB 2 tool. Since we did not include a sufficient number of RCTs (greater than 10) in

each analysis, we did not examine the potential for publication bias using a funnel plot [35].

Synthesis methods

Before combining data in a meta-analysis, we assessed studies for clinical heterogeneity such as variations in participants, interventions, outcomes, and time points. We assessed statistical heterogeneity using the I^2 statistic as recommended in Chapter 10 of the *Cochrane Handbook for Systematic Reviews of Interventions* [33]. We used the following thresholds for the interpretation of the I^2 statistic.

- 0% to 40%: might not be important
- 30% to 60%: may represent moderate heterogeneity
- 50% to 90%: may represent substantial heterogeneity
- 75% to 100%: considerable heterogeneity

Where we considered studies to be sufficiently similar, we conducted a meta-analysis using a random-effects model.

Investigation of heterogeneity and subgroup analysis

As we did not have sufficient data (greater than 10 trials), we did not perform prespecified subgroup analyses on the critical outcomes by:

- etiology of visual impairment (e.g. glaucoma, age-related macular degeneration, and diabetic retinopathy);
- participant age of onset of visual impairment (working-age population versus elderly population (e.g. 65 years and older));
- length of diagnosis (newly diagnosed: within last six months versus established diagnosis: greater than six months).

Equity-related assessment

We did not investigate equity-related characteristics in this review.

Sensitivity analysis

We did not undertake sensitivity analysis by excluding studies judged at overall high risk of bias because none of the included studies had an overall high risk of bias.

Certainty of the evidence assessment

We presented [Summary of findings 1](#) to provide key information concerning the certainty of evidence, the magnitude of effect of

the interventions examined, and the summary of the available data on the two critical outcomes, overall HRQoL and VRQoL scores, reported at the end of follow-up and adverse events during the study period. We followed the guidelines in Chapter 14 of the *Cochrane Handbook for Systematic Reviews of Interventions* [36].

Two review authors independently performed the GRADE assessment to evaluate the certainty of the review findings. We graded the certainty of evidence of 'high,' 'moderate,' 'low,' or 'very low' based on:

- high risk of bias among included studies;
- indirectness of evidence;
- unexplained heterogeneity or inconsistency of results;
- imprecision of results;
- high probability of publication bias.

Consumer involvement

Consumers were not involved in this review.

RESULTS

Description of studies

Results of the search

We conducted electronic database searches in May 2024, which yielded 14,366 records from databases and 6706 from trial registries. After removal of duplicates, we screened 15,286 unique titles and abstracts and retrieved 137 full-text reports for further assessment. After full-text screening, we included 20 studies (54 records), identified seven ongoing studies (nine records), and excluded 69 studies (73 records). We listed one study as awaiting classification as the details of the interventions were not described. A study selection flow diagram is shown in [Figure 1](#). We attempted to contact the study investigators for 11 studies to clarify the status of the ongoing studies or eligibility (ChiCTR-TRC-13003750 [37]; CTRI/2008/091/000192 [38]; DRKS00015609 [39]; ISRCTN08985063 [40]; ISRCTN16023965 [41]; ISRCTN80599264 [42]; NCT00545220 [43]; NCT01499628 [44]; NCT01799707 [45]; Rees 2015 [46, 47, 48]; Rovner 2007 [49, 50]), and we received responses from three study investigators.

Figure 1. Study flow diagram.

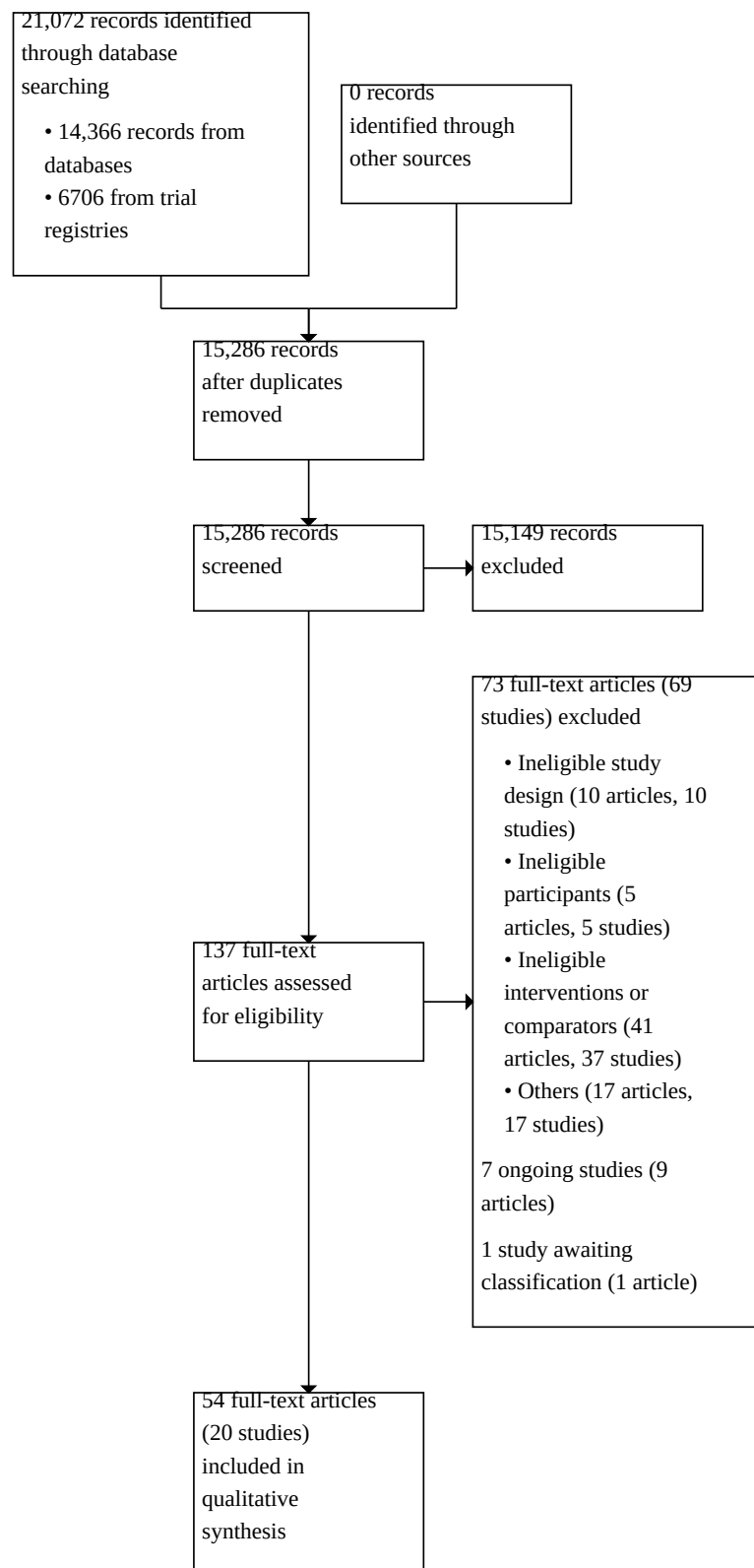
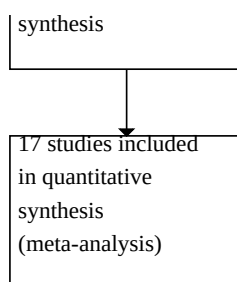


Figure 1. (Continued)



Included studies

We included 20 parallel-group RCTs (Acton 2016 [51, 52, 53]; Brody 1999 [54]; Brody 2002 [55, 56, 57]; Eklund 2004 [58, 59, 60, 61, 62]; Ghasemi 2018 [63, 64]; Girdler 2010 [65]; Goldstein 2007 [66]; Kamga 2017 [67, 68, 69]; Pankow 2004 [70]; Rees 2015; Reeves 2004 [71, 72]; Riazi 2022 [73, 74, 75, 76]; Rovner 2007; Rovner 2013 [77, 78]; Rovner 2014 [79, 80, 81]; Stelmack 2008 [82, 83, 84, 85, 86]; Stelmack 2017 [87, 88, 89, 90, 91, 92, 93]; Tey 2019 [94, 95]; van der Aa 2015 [96, 97]; Vreeken 2020 [98, 99]), which randomized 3151 participants, ranging from 30 (Pankow 2004) to 323 (Stelmack 2017) per study, with a median of 153 (interquartile range (IQR) 80 to 226). Studies were conducted in Asia (Iran (one) and Singapore (one)), Australia (two), Europe (UK (three), Netherlands and Belgium (two), Sweden (one)), and North America (US (nine) and Canada (one)) in academic medical centers, hospitals, private practice, low-vision clinics, Veterans Affairs medical facilities, and rehabilitation centers. One study was funded by industry (Pankow 2004), while others received a research grant or support from a non-profit organization or foundation. A summary of the included studies is described in Table 1, and key study characteristics and study details for all 20 included studies are available in Supplementary material 2.

Types of participants

The mean age of participants in the included studies ranged from 60.2 years (Tey 2019) to 84 years (Rovner 2014), with a median of 79 years (IQR 75 to 80). The gender of participants was reported in all but one study (Eklund 2004). The proportion of women among the participants varied across studies, ranging from 2% (Stelmack 2008) to 70% (Rovner 2014) per study (median 58%, IQR 50 to 65). Of 13 studies reporting logMAR best-corrected distance visual acuity at baseline, the mean visual acuity ranged from 0.15 to 1.11 (median 0.67, IQR 0.37 to 1.00).

Of the 18 studies that identified the cause of participants' low vision, age-related macular degeneration was the predominant cause in 15 studies; of these, age-related macular degeneration affected 46% (Riazi 2022; van der Aa 2015) to 100% (Brody 1999; Brody 2002; Eklund 2004; Reeves 2004; Rovner 2013; Rovner 2014) of participants per study. Another study included only participants with macular-related vision loss, without further distinction as to specific type (Stelmack 2008). One study attributed the participants' low vision primarily to diabetic retinopathy (37%) (Ghasemi 2018), while another study noted diabetic retinopathy (20%) and glaucoma (20%) as the predominant causes (Tey 2019). Other causes of low vision indicated in the included studies were

cataract and stroke-related complications. Ten studies defined low vision as a diagnosed eye disease, including macular diseases, diabetic retinopathy, and glaucoma.

The inclusion criteria of 16 studies required a best-corrected distance visual acuity measurement within various ranges; four of these also accepted a visual field measurement within a certain range, either in addition to or instead of the best-corrected distance visual acuity. The inclusion criteria for seven of the studies specifically mention that participants' visual loss must have impacted a valued activity or daily tasks, required assistive devices, was significant enough to require services beyond those offered by standard eye care practitioners, or combinations of these. The remaining studies used a broader approach to what was considered low vision. Vreeken 2020 reported that 65% of participants had low vision. However, they included participants with "a decimal visual acuity of ≤ 0.3 " according to inclusion criteria; therefore, we decided to include this study. We did not identify any study that included adults with dual sensory impairments.

Types of interventions and comparators

Multifaceted self-management interventions varied across included studies. The comparison group was no care or wait list in seven studies, while other active controls included usual care, optical aids, or low-vision rehabilitation in 11 studies. In a three-arm design, Brody 2002 compared self-management intervention, tape-recorded education program, and wait-list control. We combined the data from the latter two groups. Reeves 2004 was another three-arm study comparing enhanced low-vision rehabilitation with home visit, conventional vision rehabilitation, and conventional vision rehabilitation with home visit but without enhanced rehabilitation. We summarized the intervention and comparator for all studies in Supplementary material 2 and Table 1.

Types of outcomes

Included studies measured HRQoL, VRQoL, or both as critical outcomes up to six months from baseline. Related participant-reported outcome measures and subscores, such as psychological well-being, physical functioning, social measures, or combinations of these, were also included and reported.

Table 1 shows which studies contributed results to which syntheses: meta-analysis or summary.

Critical outcomes

- HRQoL: eight studies examined HRQoL; four studies used the EQ-5D (Acton 2016; Stelmack 2017; Tey 2019; van der Aa 2015) and four studies used the SF-36 (Eklund 2004; Girdler 2010; Reeves 2004; Stelmack 2008).
- VRQoL: 13 studies examined VRQoL; five studies used the NEI VFQ to measure visual function (Brody 2002; Ghasemi 2018; Rovner 2007; Rovner 2013; Rovner 2014), three studies used the VA LV VFQ (Acton 2016; Stelmack 2008; Stelmack 2017), two studies used the IVI (Rees 2015; Tey 2019), one study used the LVQOL (van der Aa 2015), one study used the VISQOL (Riazi 2022), and one study used the VCM (Reeves 2004).
- Proportion of participants who experienced any adverse events: four studies reported adverse events (Acton 2016; Rovner 2014; Stelmack 2008; Stelmack 2017).

Important outcomes

- Mean change in HRQoL and VRQoL subscores also included the following.
 - Psychological well-being, emotional distress, or depression and anxiety: 13 studies examined this outcome; three studies used the CES-D to measure depression (Stelmack 2008; van der Aa 2015; Vreeken 2020), three studies used the PHQ-9 to measure depression (Acton 2016; Kamga 2017; Rovner 2014), two studies used the POMS to measure emotional distress (Brody 1999; Brody 2002), two studies used the DASS to measure depression and anxiety (Rees 2015; Tey 2019), one study used the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) to measure mental well-being (Riazi 2022), one study used the Hamilton Depression Rating Scale (HDRS) to measure depression (Rovner 2007), and one study used the GDS to measure depression (Girdler 2010).
 - Physical functioning: 10 studies examined this outcome; two studies used the Life Space Questionnaire (Kamga 2017; Riazi 2022), two studies used the LV VFQ Morbidity subscore (Acton 2016; Stelmack 2017), two studies used the SF-36 Physical subscore (Stelmack 2008; Tey 2019), one study used the IVI Morbidity subscore (Rees 2015), one study used the Activities of Daily Living (ADL Step) to measure independence in activities of daily living (Eklund 2004), one study used the Functional Independence Measure for Blind Adults, Living Skills, Orientation and Mobility Skills (FIMBA) to measure independent mobility (Pankow 2004), and one study used the Target Vision Function (TVF) (Rovner 2013).
 - Self-efficacy: eight studies examined this outcome; four studies used the Generalized Self-Efficacy Scale (GSES) (Girdler 2010; Rees 2015; Riazi 2022; Tey 2019), two studies used the Age-related Macular Degeneration Self-Efficacy Questionnaire (AMD-SEQ) (Brody 1999; Brody 2002), and two studies used the Self-Efficacy Scale (Goldstein 2007; Kamga 2017).
 - Adaptation to vision loss: seven studies examined this outcome; four studies used the Age-Related Vision Loss (AVL) (Acton 2016; Girdler 2010; Rees 2015; van der Aa 2015), two studies used the Nottingham Adjustment Scale (NAS) (Pankow 2004; Reeves 2004), and one study used the LVQOL adjustment subscale (Vreeken 2020).
- Reading performance: one study examined the outcome using Minnesota Low-Vision Reading Test (MNRead) (Stelmack 2017).

- Timed instrumental activities of daily living: none of the included studies reported this outcome.
- Tracing speed: none of the included studies reported this outcome.
- Facial recognition: none of the included studies reported this outcome.
- Mobility: we summarized this outcome as physical functioning.

Excluded studies

We excluded 69 studies (73 records) during full-text screening and documented the reasons for exclusion in [Supplementary material 3](#). In summary, we excluded 10 studies that were not parallel-group RCTs, five studies that did not include adults with low-vision, and 37 studies that evaluated different interventions of the interest. We excluded 17 trial registry records because they were either completed before December 2016 or had not been updated since December 2016 or earlier.

Study awaiting classification

One study is awaiting classification (Leroi 2022 [100]) (see [Supplementary material 4](#)).

Ongoing studies

There are seven ongoing studies registered or published with the protocol from 2013 to 2021 (see [Supplementary material 5](#)).

Risk of bias in included studies

[Supplementary material 6](#) presents the risk of bias assessment. Full consensus responses to the signaling questions for each domain across all studies are available upon reasonable request.

We assessed the overall risk of bias as low in three studies and as having some concerns in 10 studies. Each study received a consistent risk of bias rating across all outcomes.

Bias arising from the randomization process

For this domain, we considered 11 studies at low risk of bias for all outcomes. Studies randomized participants using a computer-generated randomization schedule (Brody 2002; Stelmack 2008; Stelmack 2017; Rees 2015; van der Aa 2015), random number table (Ghasemi 2018; Rovner 2007; Rovner 2013; Rovner 2014), or an independent telephone (Tey 2019) or web-based (Riazi 2022) randomization service. Allocation was adequately concealed before randomization in these studies. We judged two studies to have some concerns for this domain because allocation concealment was not described (Acton 2016; Eklund 2004).

Bias introduced by deviations from the intended interventions

For all outcomes, we judged all studies at low risk of bias for this domain. Although participants and study personnel were unable to be masked to treatment assignments due to the nature of interventions, there were no deviations from the intended interventions. Studies performed using intention-to-treat or modified intention-to-treat analyses.

Bias arising from missing outcome data

We judged all studies at low risk of bias regarding missing outcome data. The efficacy outcome data (i.e. HRQoL and VRQoL) were available for all or nearly all randomized participants in eight

studies (Acton 2016; Brody 2002; Ghasemi 2018; Riazi 2022; Rovner 2007; Stelmack 2008; Stelmack 2017; van der Aa 2015), whereas the data in other studies were available for approximately 57% (Eklund 2004), 77% (Tey 2019), 84% (Rees 2015), and 89% (Rovner 2013; Rovner 2014) of randomized participants; however, the missingness of the data was well-balanced across intervention and control groups, and it was unlikely to have been related to the bias.

For the adverse events, all or nearly all randomized participants were included in the analysis.

Bias in measurement of the outcome

We judged all studies at low risk of bias in this domain. HRQoL and VRQoL outcomes were measured using a validated questionnaire and conducted by masked interviewers for all but one study (Ghasemi 2018). In Ghasemi 2018, although it was unclear whether or not the interviewer was masked, it stated that participants were required to respond accurately and honestly to all information.

Bias in selection of the results reported

The published protocol was available, and the analysis was consistent with the prespecified analysis plan for four studies (Acton 2016; Stelmack 2008; Stelmack 2017; van der Aa 2015); we judged these studies at low risk of bias for selective reporting of outcomes. In the remaining studies, either a protocol was not available or a trial registry record was available, but there was

insufficient information to judge this domain. We judged them as having some concerns for this domain.

Synthesis of results

A complete record of analyses is available in [Supplementary material 7](#) and a full data package is available in [Supplementary material 8](#).

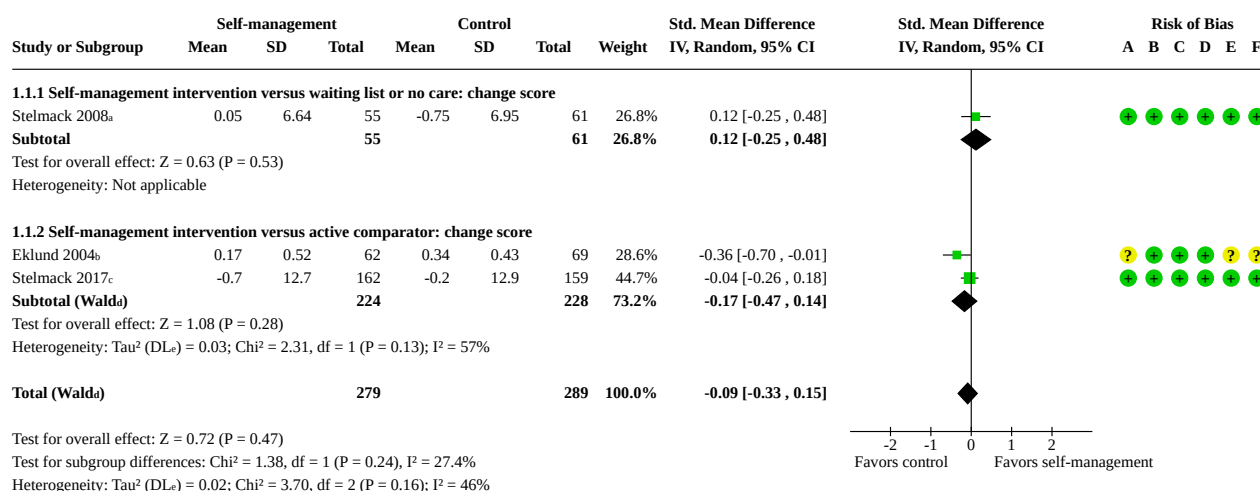
Absolute and relative effects for critical outcomes and adverse events are summarized with their GRADE ratings signifying confidence in the effect estimates in [Summary of findings 1](#). We used the SMD with 95% CIs where studies employed different tools, and interpreted SMDs according to Cohen's effect sizes (i.e. 0.2 represents a small effect, 0.5 represents a moderate effect, and 0.8 represents a large effect).

Critical outcomes

Mean change in overall health-related quality of life

The pooled effect of three studies reporting change score from baseline was imprecise and showed little to no difference between self-management and control (SMD -0.09, 95% CI -0.33 to 0.15; $I^2 = 46%$; 3 studies, 568 participants; low-certainty evidence; Analysis 1.1; [Figure 2](#)). This finding remained consistent, irrespective of the type of control group used: wait list (SMD 0.12, 95% CI -0.25 to 0.48; 1 study, 116 participants) or active control (SMD -0.17, 95% CI -0.47 to 0.14; $I^2 = 57%$; 2 studies, 452 participants).

Figure 2. Overall health-related quality of life-change score.



Footnotes

- ^aSF-36: 36-Item Short Form Health Survey (higher = better QoL), change from baseline at 4 months, calculated from Physical and Mental Component Summary scores
^bSF-36: (higher = better QoL), change from baseline at 28 months
^cEQ-5D: European Quality of Life Five Dimension, SF-36: (higher = better QoL); change from baseline at 4 months; data from van Nispen 2020 (from study authors)
^dCI calculated by Wald-type method.
^e Tau^2 calculated by DerSimonian and Laird method.

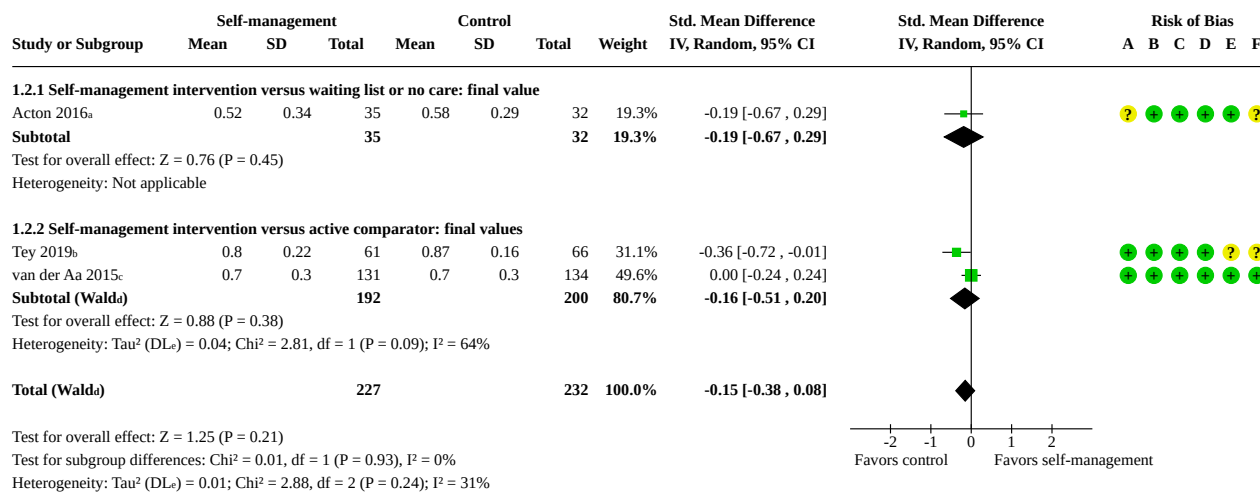
Risk of bias legend

- (A) Bias arising from the randomization process
(B) Bias due to deviations from intended interventions
(C) Bias due to missing outcome data
(D) Bias in measurement of the outcome
(E) Bias in selection of the reported result
(F) Overall bias

Three studies reporting the results by final value were imprecise and showed little to no difference between self-management and control (SMD -0.15, 95% CI -0.38 to 0.08; $I^2 = 31\%$; 3 studies, 459 participants; low-certainty evidence; Analysis 1.2; Figure 3). Again,

the findings remained consistent, regardless of the type of control group used: wait list (SMD -0.19, 95% CI -0.67 to 0.29; 1 study, 67 participants) or active control (SMD -0.16, 95% CI -0.51 to 0.20; $I^2 = 64\%$; 2 studies, 392 participants).

Figure 3. Overall health-related quality of life score – final value.



Footnotes

^aEQ-5D: European Quality of Life Five Dimension (higher = better QoL), mean at 6 months

^bEQ-5D: (higher = better QoL), mean at 6 months

^cEQ-5D: (higher = better QoL), mean at 24 months

^dCI calculated by Wald-type method.

^e Tau^2 calculated by DerSimonian and Laird method.

Risk of bias legend

(A) Bias arising from the randomization process

(B) Bias due to deviations from intended interventions

(C) Bias due to missing outcome data

(D) Bias in measurement of the outcome

(E) Bias in selection of the reported result

(F) Overall bias

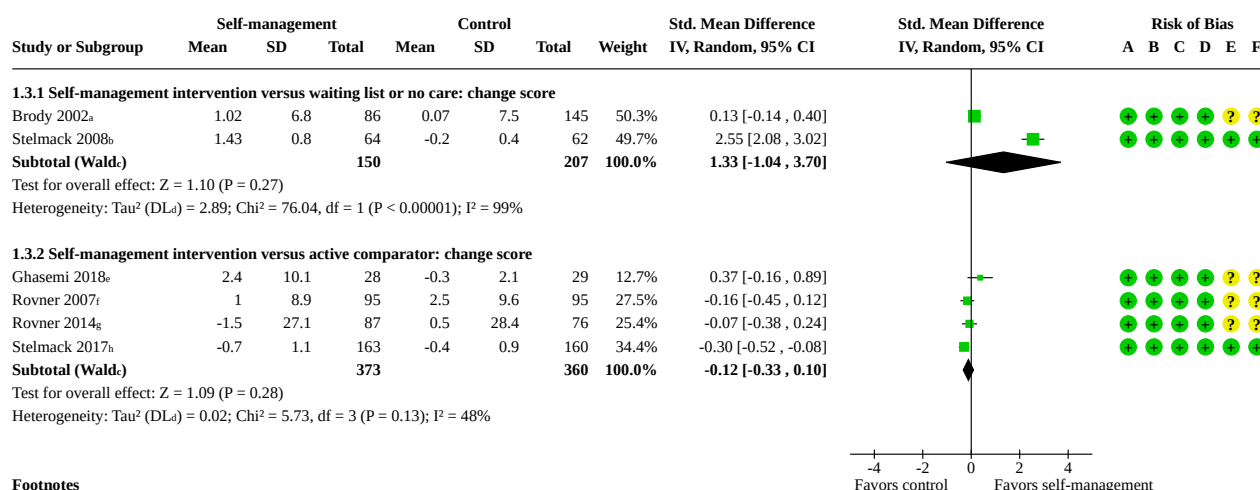
We did not include two studies in the meta-analysis because there was insufficient information (e.g. SDs) provided. Girdler 2010 observed an effect on the SF-36 Physical Component Summary score (PCS) (effect size 0.23; $P = 0.001$) in favor of the self-management group compared to usual care at 12 weeks, but not in the SF-36 Mental Component Summary score (MCS) (effect size 0.03; $P = 0.102$). Reeves 2004 reported that both SF-36 PCS and MCS were improved in a conventional vision rehabilitation group compared to an enhanced low-vision rehabilitation group at 12 months (PCS: MD -6.05, 95% CI -10.2 to -1.91; $P = 0.004$; MCS: MD -4.04, 95% CI -7.44 to -0.65; $P = 0.02$).

We judged the certainty of evidence regarding HRQoL as low according to GRADE criteria, downgrading one level due to imprecision and one level for inconsistency.

Mean change in overall vision-related quality of life

We did not pool the data from six studies reporting change score, as there was considerable heterogeneity ($I^2 = 96\%$) and the direction of the estimated effect was inconsistent. Two studies used wait-list controls. In Brody 2002, the estimate was small and imprecise at six weeks (SMD 0.13, 95% CI -0.14 to 0.40; 231 participants), while Stelmack 2008 reported that participants receiving the self-management intervention improved VRQoL at four months compared with those who were assigned to the wait-list control (SMD 2.55, 95% CI 2.08 to 3.02; 126 participants). The remaining four studies comparing self-management interventions to active control showed no evidence of an important difference between groups on VRQoL at three to six months (SMD -0.12, 95% CI -0.33 to 0.10; $I^2 = 48\%$; 4 studies, 733 participants; low-certainty evidence; Figure 4).

Figure 4. Overall vision-related quality of life score – change score.



Footnotes

- ^aNEI-VFQ: National Eye Institute Visual Function Questionnaire (score 0–100, higher = better QoL), mean change from baseline at 6 weeks
- ^bVA LV VFQ 48: Veterans Affairs Low Vision Visual Functioning Questionnaire (higher = better QoL), change from baseline at 4 months (2-month intervention)
- ^cCI calculated by Wald-type method.
- ^d τ^2 calculated by DerSimonian and Laird method.
- ^eNEI-VFQ-39: Persian version of NEI-VFQ-25, validity and reliability tested, scale 0 (worst) to 100 (best); change from baseline at 3 months (1-month intervention, 2-month follow-up)
- ^fNEI-VFQ-17: (higher = better QoL), mean change from baseline at 6 months (2-month intervention, 4-month maintenance)
- ^gNEI-VFQ: (higher = better QoL), mean change from baseline at 4 months; data from van Nispen 2020 (from study authors)
- ^hVA LV VFQ: (higher = better QoL), change from baseline at 4 months; data from van Nispen 2020 (from study authors)

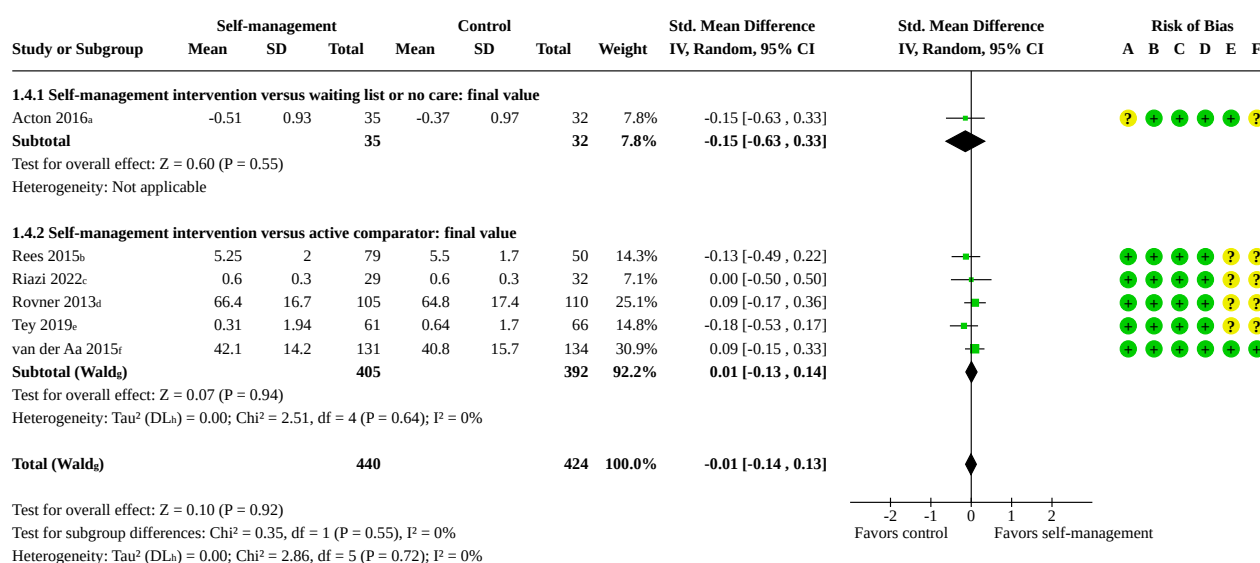
Risk of bias legend

- (A) Bias arising from the randomization process
- (B) Bias due to deviations from intended interventions
- (C) Bias due to missing outcome data
- (D) Bias in measurement of the outcome
- (E) Bias in selection of the reported result
- (F) Overall bias

The pooled effect of six studies reporting final values in the longer-term (six to 24 months) was imprecise, with minimal effect overall (SMD -0.01, 95% CI -0.14 to 0.13; $I^2 = 0\%$; 6 studies, 864 participants; low-certainty evidence; Analysis 1.4; Figure 5). This

finding remained consistent, irrespective of the type of control group used: wait list (SMD -0.15, 95% CI -0.63 to 0.33; 1 study, 67 participants) or active control (SMD 0.01, 95% CI -0.13 to 0.14; $I^2 = 0\%$; 5 studies, 797 participants).

Figure 5. Overall vision-related quality of life score-final value.

**Footnotes**^aVA LV VFQ 48: Veterans Affairs Low Vision Visual Functioning Questionnaire, overall score (higher = better QoL); mean at 6 months^bIVI, Rasch scores: Impact of Vision Impairment (higher = better), mean at 6 months, data from 3 components (mobility/independence, emotional well-being, reading/accessing info)^cVISQOL: Vision and Quality of Life Index (higher = better QoL), mean at 9 months; IVIQ: Impact of Vision Impairment Questionnaire Rasch total score 3.50 (95% CI 1.49 to 5.51)^dNEI-VFQ: National Eye Institute Visual Function Questionnaire (higher = better QoL), mean at 6 months (3-month intervention, 3-month maintenance)^eIVI: (higher = better), mean at 6 months, calculated from 3 components (mobility/independence, emotional well-being, reading/accessing information)^fLVQOL-18: Low Vision Quality of Life Questionnaire (high = better QoL), mean at 24 months^gCI calculated by Wald-type method.^h τ^2 calculated by DerSimonian and Laird method.**Risk of bias legend**

(A) Bias arising from the randomization process

(B) Bias due to deviations from intended interventions

(C) Bias due to missing outcome data

(D) Bias in measurement of the outcome

(E) Bias in selection of the reported result

(F) Overall bias

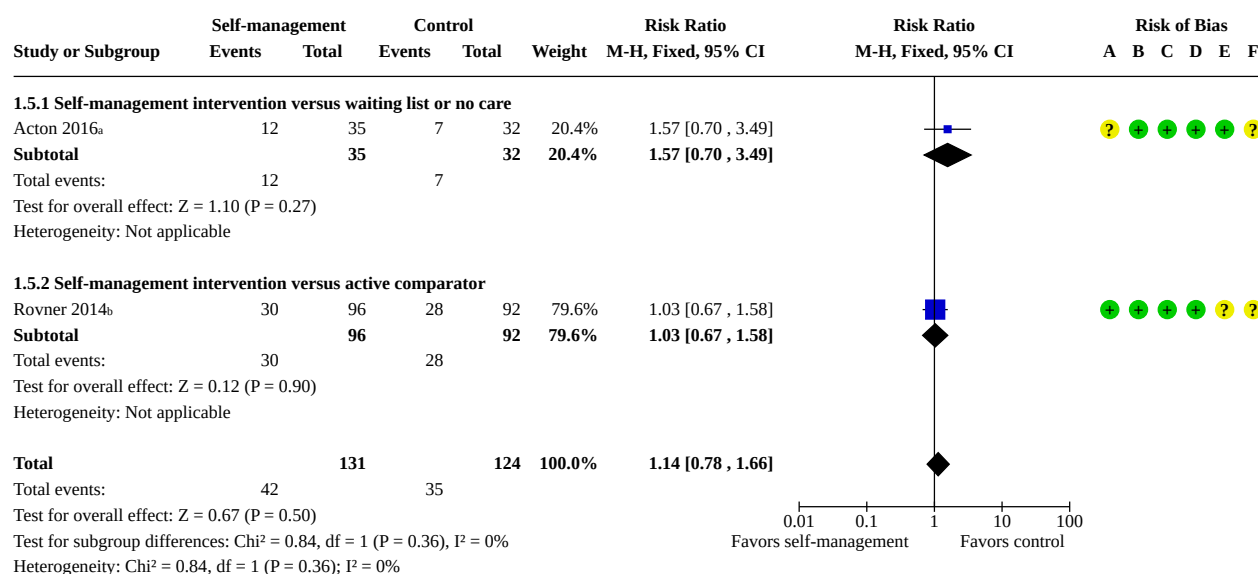
Reeves 2004 examined this outcome, but we did not include it in the analysis due to lack of data. In the study, there was little to no difference in VRQoL between the enhanced low-vision rehabilitation group and the conventional vision rehabilitation group at 12 months (effect size 0.06, 95% CI -0.17 to 0.30; $P = 0.60$).

We judged the certainty of evidence regarding VRQoL as low, downgrading one level due to imprecision and one level for inconsistency.

Proportion of participants who experienced any adverse events

Four studies reported adverse events. In Acton 2016, 12 (34%) participants in the home-visit rehabilitation group and seven (22%) participants in the wait-list control group were referred to the general medical practitioner for depressive symptoms. In its

trial registry, Rovner 2014 reported that 30 (31%) participants in the behavior activation plus low-vision rehabilitation group and 28 (30%) participants in the supportive therapy plus low-vision rehabilitation group experienced serious adverse events including deaths and strokes. Falls without a bone break occurred in 11 (11%) participants in the behavior activation plus low-vision rehabilitation group and five (5%) participants in the supportive therapy plus low-vision rehabilitation group. None of these serious adverse events were related to study treatments (personal communication with the study investigator). The pooled estimates of the proportion of participants who experienced any adverse events were imprecise (RR 1.14, 95% CI 0.78 to 1.66; $I^2 = 0\%$; 2 studies, 255 participants; low-certainty evidence; Analysis 1.5; Figure 6).

Figure 6. Proportion of participants who experienced any adverse events.**Footnotes**^aReferred to the general practitioner for depressive symptoms^bSerious adverse events reported in trial registry (NCT00769015). None of the serious adverse events were related to the study interventions (pers comm)**Risk of bias legend**

- (A) Bias arising from the randomization process
- (B) Bias due to deviations from intended interventions
- (C) Bias due to missing outcome data
- (D) Bias in measurement of the outcome
- (E) Bias in selection of the reported result
- (F) Overall bias

The remaining two studies reported there were no adverse events (Stelmack 2008) or no treatment-related adverse events (Stelmack 2017).

We judged the certainty of evidence regarding adverse events as low, downgrading two levels due to imprecision.

Important outcomes**Mean change in subscores in health-related quality of life and vision-related quality of life****Psychological well-being, emotional distress, or depression and anxiety**

Five studies reporting the results by change score, suggested that overall self-management interventions may result in a small improvement in depressive symptoms (SMD -0.25 , 95% CI -0.43 to -0.06 ; $I^2 = 38\%$; 5 studies, 769 participants; Analysis 1.6). Two studies using active control showed a small effect with 95% CI covering the null value (SMD -0.12 , 95% CI -0.37 to 0.13 ; $I^2 = 28\%$; 2 studies, 353 participants). Three studies using a wait-list control showed a small to medium effect size in favor of the self-management intervention (SMD -0.36 , 95% CI -0.57 to -0.14 ; $I^2 = 12\%$; 3 studies, 416 participants).

The pooled effect of seven studies reporting final values was imprecise and showed a minimal effect (SMD 0.03 , 95% CI -0.13 to 0.19 ; $I^2 = 32\%$; 7 studies, 942 participants; Analysis 1.7). This finding

remained consistent, irrespective of the type of control group used: wait list (SMD -0.05 , 95% CI -0.64 to 0.55 ; $I^2 = 63\%$; 2 studies, 121 participants) or active control (SMD 0.04 , 95% CI -0.13 to 0.21 ; $I^2 = 34\%$; 5 studies, 821 participants).

Additionally, two studies reporting the outcome of depressive symptoms were not included in the meta-analysis due to insufficient data. There was little to no difference in depressive symptoms measured by the Center for Epidemiological Studies Depression Scale (CES-D) at three months (effect size -0.05 , 95% CI -0.39 to 0.30) in Vreeken 2020. Girdler 2010 observed the small effect of improving depressive symptoms in favor of the self-management group compared with usual care at 12 weeks (effect size of 0.18 ; $P = 0.001$). Conversely, in Reeves 2004, physical well-being measured by SF-36 PCS showed an improvement in the conventional vision rehabilitation group compared with the enhanced low-vision rehabilitation group at 12 months (MD -4.04 , 95% CI -7.44 to -0.65 ; $P = 0.02$).

Physical functioning

The pooled estimate using change score suggested that self-management interventions may result in small effects on physical functioning (SMD 0.21 , 95% CI 0.05 to 0.36 ; $I^2 = 0\%$; 4 studies, 640 participants; Analysis 1.8). However, the estimate became imprecise for two studies with a wait-list control (SMD 0.12 , 95% CI -0.17 to 0.40) or three studies with short-term follow-up (up to four

months) (SMD 0.15, 95% CI -0.03 to 0.32; 3 studies, 509 participants) after removing Eklund 2004, which had 24-month follow-up.

For six studies that reported final values, the pooled estimate showed an imprecise and minimal effect (SMD 0.02, 95% CI -0.13 to 0.18; $I^2 = 0\%$; 6 studies, 653 participants; Analysis 1.9). This finding remained consistent, irrespective of the type of control group used: wait list (SMD 0.12, 95% CI -0.28 to 0.52; 2 studies, 97 participants) or active comparator (SMD 0.01, 95% CI -0.16 to 0.17; 4 studies, 556 participants).

We did not include two studies in the meta-analysis due to insufficient data provided. In Girdler 2010, physical functioning showed a small to medium improvement in the self-management plus usual care group compared with usual care at three months (Activity Card Sort (effect size 0.31; $P = 0.001$) and SF-36 PCS (SMD 0.23; $P = 0.001$)). In Reeves 2004, conventional vision rehabilitation showed an improvement compared with enhanced low-vision rehabilitation at 12 months (effect size -6.05, 95% CI -10.2 to -1.91; $P = 0.004$).

Self-efficacy

The meta-analysis of three other studies using change score suggested that self-management interventions may have small effects on self-efficacy compared with wait-list control (SMD 0.23, 95% CI 0.04 to 0.41; $I^2 = 0\%$; 3 studies, 452 participants; Analysis 1.10).

The pooled effect of three studies using the GSES showed that the self-management intervention resulted in little to no difference in self-efficacy in the longer term (six to nine months) compared with usual care control (SMD 0.21, 95% CI -0.17 to 0.60; $I^2 = 66\%$; 3 studies, 241 participants). However, in Brody 1999, a self-management intervention improved self-efficacy in the short-term (six weeks) compared with a wait-list control (SMD 0.59, 95% CI 0.07 to 1.12; 1 study, 59 participants). The pooled effect of these four studies was imprecise with substantial heterogeneity (SMD 0.29, 95% CI -0.05 to 0.63; $I^2 = 62\%$; 4 studies, 400 participants; Analysis 1.11).

Two studies were not included in the meta-analysis due to there being insufficient data. In Girdler 2010, the addition of a self-management program may result in a small improvement in self-efficacy compared with usual care alone at three months (effect size of 0.14 measured using the GSES, and 0.30 measured using the AMD-SEQ; $P = 0.001$). Reeves 2004 showed that enhanced low-vision rehabilitation did not add benefit to conventional vision rehabilitation (effect size -0.44, 95% CI -2.88 to 2.00; $P = 0.72$).

Adaptation to vision loss

The pooled effect of four studies reporting final values was imprecise (SMD 0.07, 95% CI -0.10 to 0.25; $I^2 = 0\%$; 4 studies, 515 participants; Analysis 1.12), suggesting self-management interventions may result in little to no effect on adaptation to vision loss. The conclusion was unchanged irrespective of the control used: wait-list control (SMD 0.31, 95% CI -0.09 to 0.71; $I^2 = 0\%$; 2 studies, 97 participants), or active control (SMD 0.02, 95% CI -0.18 to 0.21; $I^2 = 0\%$; 2 studies, 418 participants).

Three studies were not included in the meta-analysis due to insufficient data provided. In Vreeken 2020, there was no evidence of an important difference between intervention and control

groups in mean change from baseline at three months (effect size 0.06, 95% CI 0.28 to 0.41). Girdler 2010 reported that the effect size was small for this outcome at three months ($P = 0.058$). Reeves 2004 reported that enhanced low-vision rehabilitation did not add benefit to conventional vision rehabilitation (effect size -0.36, 95% CI -3.04 to 2.32; $P = 0.79$).

Mean change in vision-related living performance measures from baseline

Reading speed

Stelmack 2017 examined reading speed using the Minnesota Low-Vision Reading Test. The maximum reading was measured using the smallest print that could be read at the maximum speed. After four months, the combination of self-management plus low-vision rehabilitation showed an improvement in mean reading speed of 19.5 (SD 79) words per minute compared with mean reduction of 1.5 (SD 40.1) words in the standard low-vision rehabilitation group (MD 21.00, 95% CI 6.06 to 35.94; 283 participants; Analysis 1.13).

Timed instrumental activities of daily living

None of the included studies reported this outcome.

Tracing speed

None of the included studies reported this outcome.

Facial recognition

None of the included studies reported this outcome.

Mobility outcomes

We reported this outcome under the 'Physical functioning' section.

Subgroup analyses

We did not perform any subgroup analysis as no analysis included 10 or more studies, as described in the protocol [11].

Equity assessment

We did not examine any equity-related characteristics in this review.

Reporting biases

For each study, we assessed the risk of bias for selective reporting and reported the judgments in [Supplementary material 6](#).

DISCUSSION

Summary of main results

In our review, we identified 20 relevant RCTs that enrolled 3151 adults who had low vision primarily due to age-related macular degeneration. The multifaceted self-management interventions varied widely across the studies, and the comparison group was either inactive (e.g. wait list) or active (e.g. usual care, optical aids, and low-vision rehabilitation). We rated the overall risk of bias of included studies as having low risk or some concerns.

The meta-analysis suggested that there was little to no difference in overall HRQoL and VRQoL, physical functioning, adaptation to vision loss, and adverse events between self-management intervention and control groups, regardless of the type of control group used. The evidence from five studies with 769 participants

suggested that self-management interventions may result in a small improvement in depressive symptoms compared with active control. Additionally, the meta-analysis of three studies suggested that self-management interventions may have a slight improvement in self-efficacy compared with wait-list control. We judged the certainty of evidence as low for all of our critical outcomes (overall scores of HRQoL and VRQoL, and adverse events).

Limitations of the evidence included in the review

The majority of the included studies recruited older participants with a diagnosis of age-related macular degeneration from eye clinics or low-vision rehabilitation centers in high-income countries. Therefore, it is unclear whether the evidence would be applicable to younger adults, adults with congenital vision impairment, or adults with other causes of acquired vision loss. There is also a potential lack of applicability of the findings to lower resource settings. Additionally, the overarching health concerns of older adults, such as hearing loss, depression, neurodegenerative diseases, arthritis, diabetes, and hypertension, may potentially confound the results, as regardless of visual status or intervention, the effects of aging may be too significant to be overcome by self-management techniques alone.

Our operational definition of 'self-management' required a multicomponent intervention that equipped people with the skills to actively participate and take responsibility for the management of their condition. This led to significant variability between studies in the exact content of the intervention, which could explain the observed heterogeneity. Furthermore, the majority of studies measured short-term outcomes only, based on a single delivery of the intervention. Therefore, we were unable to explore whether there was any dose-response relationship between the intensity of treatment and the outcomes measured. It is also important to consider that depressive symptoms, which were reported as an adverse event in some studies, may not have been related to the intervention provided. Depressive conditions might have existed prior to the study and may not have been adequately treated, further influencing the outcomes. Moreover, the design of these studies often did not clearly evaluate factors such as the person's needs, visual expectations, acceptance of visual loss, realistic understanding of their progress, and the level of social support — all of which are crucial for the future success of self-management strategies.

Limitations of the review processes

Our Information Specialist performed a highly sensitive search to identify potentially eligible studies through bibliographic databases and clinical trial databases. We used standard Cochrane methodology to minimize bias.

None of the review authors have any financial conflicts of interest related to this review topic. One author (AM) had direct involvement in the conduct, analysis, or publication of two excluded studies. Following the restrictions on authorship policy by Cochrane, she did not assess the eligibility of these studies. Another author (AD) had direct involvement in the conduct, analysis, or publication of an included study (Rovner 2014). Following the restrictions on authorship policy by Cochrane, she did not assess the eligibility, extract data, carry out the risk of bias assessment, or perform

GRADE assessments for any of the related publications with Rovner 2014.

Agreements and disagreements with other studies or reviews

Our review builds upon the Cochrane review by van Nispen and colleagues [34]. Similar to their findings, our review found no evidence of benefit on HRQoL, but a slight effect on subscores of VRQoL. Much like previous work on this topic, there is significant variability in measurements, methods of intervention, and length of follow-up, limiting the analysis. The effects of self-management interventions on VRQoL and HRQoL were similar to the previous review even though there was a greater range of follow-up included in the current review. The self-management interventions included in the previous review ranged in follow-up from six to eight weeks, whereas the interventions included in the current review were longer, with a range from six weeks to 12 months of follow-up.

The importance of clearly defining a complex intervention in systematic reviews has been previously recognized [101], since the definition will inevitably influence study selection and potentially shape the conclusions drawn. The definition of 'self-management' used in the van Nispen review was based on the original study authors' description. By contrast, we used an operational definition that was adapted from the study of Jonkman and colleagues [8]. We defined a 'self-management intervention' as one that contained at least two of the following components: problem-solving, goal-setting, decision-making, self-monitoring, coping with the condition, facilitates behavior change or improves physical, psychological functioning or skills development. By using this structured definition, we aimed to focus specifically on interventions that shared common characteristics, allowing for a more targeted analysis of critical and important outcomes.

Although we acknowledge the overlap between the two reviews, the distinct approach we employed aimed to provide a clearer focus on self-management as a specific intervention type. In addition, this overlap highlights existing evidence gaps in the literature, particularly concerning the precise definition and classification of self-management interventions and its study design and framework in the context of vision rehabilitation. Future studies should address these gaps by further refining the classification of vision rehabilitation components, including self-management aspects, with respect to individual characteristics and needs, considering different contexts.

AUTHORS' CONCLUSIONS

Implications for practice

The low-certainty evidence from this review suggests that multifaceted self-management interventions have limited effects on improving health-related quality of life and vision-related quality of life. The variability in interventions and outcomes highlights the importance of personalizing self-management programs to meet the specific needs and circumstances of each individual with visual impairment.

In the absence of high-certainty evidence for significant benefits, it is important for healthcare providers to carefully consider how these self-management programs align with the objectives of patient care, taking into account the severity of vision impairment,

the patient's ability to manage their condition, and available resources.

Implications for research

Future research should focus on developing more sensitive measures of health-related quality of life and vision-related quality of life. Current measurements may not fully capture the potential benefits of self-management interventions, especially in a predominantly older adult population with complex health profiles affecting their quality of life. Additionally, there is a need to explore the effectiveness of self-management interventions on specific aspects such as depressive symptoms and self-efficacy, which have shown sensitivity to such interventions.

Future studies should aim to encompass a broader demographic range, including different stages of vision impairment and associated comorbidities, particularly dual-sensory impairment (hearing and vision).

Given the comprehensive findings of the van Nispen 2020 review [34], a more segmented approach to future systematic reviews could be manageable. This review serves as the first step in what could be a suite of more focused reviews on specific aspects of vision rehabilitation, such as self-management.

SUPPLEMENTARY MATERIALS

Supplementary materials are available with the online version of this article: [10.1002/14651858.CD015790](https://doi.org/10.1002/14651858.CD015790).

Supplementary material 1 Search strategies

Supplementary material 2 Characteristics of included studies

Supplementary material 3 Characteristics of excluded studies

Supplementary material 4 Characteristics of studies awaiting classification

Supplementary material 5 Characteristics of ongoing studies

Supplementary material 6 Risk of bias

Supplementary material 7 Analyses

Supplementary material 8 Data package

ADDITIONAL INFORMATION

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Editorial and peer-reviewer contributions

Cochrane Eyes and Vision @ US Project supported the authors in the development of this review.

The following people conducted the editorial process for this article.

- Sign-off Editor (final editorial decision): Gianni Virgili, Queen's University of Belfast and University of Florence
- Managing Editor (selected peer reviewers, provided editorial guidance to authors, edited the article): Jessica Thomas and Joey Kwong, Cochrane Central Editorial Service
- Editorial Assistant (conducted editorial policy checks, collated peer-reviewer comments and supported editorial team): Lisa Wydrzynski, Cochrane Central Editorial Service
- Copy Editor (copy editing and production): Anne Lawson, Cochrane Central Production Service
- Peer-reviewers (provided comments and recommended an editorial decision): Tunde Peto, MD, PhD, Professor of Clinical Ophthalmology, Queen's University Belfast, UK (clinical/content review); Haleh Kangari OD PhD, Department of Optometry, School of rehabilitation, Shahid Beheshti University of Medical Sciences, Tehran, Iran (clinical review); Julia Robertson Griffith University (consumer review); Jennifer Hilgart, Cochrane (methods review); Steve McDonald, Cochrane Australia (search review).

Contributions of authors

Screening search results for eligibility: all

Full-text retrieval: HE and SMN

Risk of bias assessment: all

Data extraction: all

Data entry and verification: all

Formal analysis: SMN and JGL

Interpretation of data: all

Writing the review: all

Supervision: JGL

Final approval of the document to be published: all

Declarations of interest

AM: received honoraria from Eschenbach Optik and travel stipends from Designs for Vision and Eschenbach Optik. These are not directly related to the subject matter of this review. Dr Malkin is on multiple grants including NIDLLR Grant 90DPGE0012-01-00 and NEI/NIH Grant 1R21EY029883-01.

AD: received travel funds from the American Academy of Optometry. AD has prior involvement in multiple grants including NEI Grant U01 EY018819, Multiple District 22 Lions Vision Research Foundation Fellowship Grant, Reader's Digest Partners for Sight Foundation Grant, NEI Grant R01EY026617, R44EY028077, and 1R21EY029883-01. She serves as an editorial board member of Translational Vision Science & Technology. AD had direct involvement in the conduction, analysis, or publication of one included study (Rovner 2014). Following the restrictions on authorship policy by Cochrane, she did not assess the eligibility, extract data, carry out the risk of bias assessment, or perform GRADE assessments for any of the related publications with Rovner 2014.

MC: is employed by Marshall B Ketchum University.

ACQ: none.

JK: none.

HE: consulted for the American Optometric Association's Evidence-based Optometry Clinical Resources Group.

MKW: is employed by the University of Houston College of Optometry and is an advisory board member for the Lighthouse for the Blind of Fort Worth and a member of the Texas Optometric Association.

SN: reports a grant from the National Eye Institute, National Institutes of Health, USA (payment to the institution); SN is a Cochrane Eyes and Vision methodologist but was not involved in the editorial process for this review.

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Registration and protocol

Protocol (2023) doi.org/10.1002/14651858.CD015790 [11].

Data, code and other materials

As part of the published Cochrane review, the following are made available for download for users of the Cochrane Library: full search strategies for each database ([Supplementary material 1](#)); full citations of each unique report for all studies included ([Supplementary material 2](#)), excluded at the full-text screen ([Supplementary material 3](#)), awaiting classification ([Supplementary material 4](#)), or ongoing ([Supplementary material 5](#)) in the final review; study data, including study information, study arms, and study results; consensus risk of bias assessments ([Supplementary material 6](#)); and analysis data ([Supplementary material 7](#); [Supplementary material 8](#)). Appropriate permissions have been obtained for such use. Analyses and data management were conducted with Cochrane's authoring tool, Review Manager, using the inbuilt computation methods. Template data extraction forms from Covidence are available on reasonable request.

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ADDITIONAL TABLES

Table 1. Overview of included studies

Study ID	Setting, Country	Follow-up	Number of participants randomized/female (%)	Overall mean age (years)	logMAR visual acuity	Low-vision cause	Intervention	Comparator	Outcomes, analysis
Acton 2016	Single site (College of Biomedical and Life Sciences, Cardiff University; information gathered from Sight Cymru rehabilitation service), UK	6 months (up to 18 months)	71 (baseline data for 67) 36 (54%) female	75.2 (SD 16.2)	1.0 (SD 0.8)	Glaucoma (9%), DR (6%), AMD (58%), stroke-related (12%), others (15%)	Home-visit rehabilitation: 1–11 home visits by a visual rehabilitation officer to assess the needs of the individual with low vision in several areas such as functional vision, emotional difficulties, personal care, and mobility. Training and support was tailored. Participants also had access to standard hospital and community optometric assessments	Wait list	• AVL-12-MA • EQ-5D-MA • PHQ-9-MA • UCLA Loneliness Scale • VA LV VFQ-48-MA • WEMW-BS • Adverse events-MA
Brody 1999	Single site (university ophthalmology clinic, University of California San Diego), USA	6 weeks	92 (baseline data for 54) 27 (50%) female	79 (SD 5.8)	NR	AMD (100%)	Self-management program: 6 weekly 2-hour group sessions with 7–10 participants in each group; each session of interventions comprised 2 key elements: didactic presentations and group problem-solving with guided practice	Wait list	• AMD-SEQ-MA • POMS-MA • QWBS
Brody 2002	Setting unclear, USA	6 weeks' intervention, 6 months' follow-up	252 (baseline data for 241) 153 (66.2%) female	80.9 (SD 6.1)	1.11	AMD (100%)	2 hours per week over 6 weeks (8–10 participants per group) in an eye center conference room, led by an experienced professional in public health and behavioral medicine; session included didactic presentations and group problem-solving activities, focusing on cognitive aspects and	Tape recorded education program, or wait list	• AMD-SEQ-MA • DSSI • LOT-R • NEI-VFQ-MA

Table 1. Overview of included studies (Continued)

							behavioral strategies, including effective communication, problem-solving through scenarios, and demonstrating adaptive behaviors.		• POMS-MA
Eklund 2004	Multiple sites (2 university-affiliated hospitals/low-vision clinics), Sweden	28 months, primary outcome 4 months	253 NR females	Median 79	Median 0.3	AMD (100%)	Health educational program targeted groups of 4–6 participants with AMD, forming 20 groups over an 8-week intervention period with weekly 2-hour sessions. Led by trained occupational therapists, the program focused on providing information, skills training, and support for daily activities. Participants also used a booklet for preparation and engagement.	Standard individual intervention program: optical aids and information provided typically included 1 or 2 × 1-hour sessions at the clinic, with follow-up telephone calls over a 4-week period.	• ADL step-MA • Perceived security in performing daily occupations (validated) • Self-reported health problems • SF-36-MA • Visual acuity
Ghasemi 2018	Single site (Khatam al-Anbia Eye Hospital, Mashhad), Iran	3 months (1 month' intervention, 2 months' follow-up)	57 23 (40.4%) females	66.2 (SD 5.1)	NR	Glaucoma (25%), DR (37%), AMD (14%), others (24%)	Self-management educational program: 6 sessions over 3 months (1 month' intervention and 2 months' follow-up); weekly 1-hour sessions, together with routine programs of the center through face-to-face manner. The intervention included 5 steps (assess, advise, agree, assist, arrange)	Routine training in the clinic; some gifts to be encouraged to continue co-operation.	• NEI-VFQ-39-MA
Girdler 2010	Single site (Association for the Blind of Western	12 weeks (intervention 8 weeks and main-	77 50 (64.9%) females	79.1 (SD 6.7)	0.98 (SD 0.47)	AMD (79%), others (21%)	Self-management plus usual care: 8-week (24 h) structured program of welcome and warm-up exercises, revision of homework, learning sessions (including learning and practice activities) and homework assign-	Usual care: 1-to-1 case management	• ACS • AMD-SEQ-

Table 1. Overview of included studies (Continued)

	Australia), Australia	tenance 4 weeks)					ments, delivered in a group environment with 6–10 participants, and led by an oc- cupational therapist and a social worker		sum- mary • AVLS- sum- mary • GDS- sum- mary • GSES- sum- mary • SF-36- sum- mary
Goldstein 2007	Single site (the Schepens Eye Research Institute in Florida), USA	3 months (inter- view at 2 weeks and 3 months after base- line)	154 97 (64.2%) females	75.5 (SD 9.2)	NR	NR	Educational and motivational video over 2 weeks for participants with low vision to address the educational, emotional, motivational needs associated with liv- ing with low vision due to AMD. It aimed to improve knowledge of anatomy of the eye and pathology, types of rehabilitative devices available, simple adaptive envi- ronmental changes to consider, lifestyle changes and resources for information, services and devices.	Wait list	• Emo- tional re- sponse • Self- effica- cy-MA
Kamga 2017	Single site (the reti- nal clinics of Maison- neuve-Rose- mont Hospital in Montreal), Canada	8 weeks	80 50 (63%) females	76 (SD 12)	0.37 (SD 0.2)	AMD 55%, DR 45%	Self-care tool intervention ≤ 3 coaching telephone calls: toolkit consisted of a 3- ring binder notebook filled with written tools using 18-point font as well as audio tools. 2 tools incorporated cognitive-be- havioral therapy principles: the Antide- pressant Skills Workbook (written and au- dio versions) which taught skills such as reactivating your life, thinking realistical- ly, and problem-solving and a Mood Moni- toring tool. These 2 tools along with a DVD on depression were the 3 core tools of the toolkit; 3 × 10-minute telephone calls from a trained coach.	Wait list	• GAD-7 • Life Space Assess- ment Ques- tion- naire • PHQ-9- MA • Self- efficacy scale- MA
Pankow 2004	Unclear, USA	Interven- tion min-	30	77.8 (SD 7.4)	NR	DR (10%), AMD	Minimum of 4 weeks of treatments, in- cluding blind rehabilitation teaching, ori-	Wait list	• FIM- BA-MA

Table 1. Overview of included studies *(Continued)*

			imum of 4 weeks, postinter- vention testing 4– 6 weeks after the services ended	17 (56.7%) females		(47%), stroke- related (33%), others (10%)	entation and mobility training, and oc- cupational therapy with prism for hemi- anopia, optical aids		• NAS-2- MA
Rees 2015	Single site (Royal Victo- rian Eye and Ear Hospital, Melbourne), Australia	6 months	153 92 (60.1%) females	80.2 (SD 8.1)	NR	Glauco- ma (6.6%), DR (6.6%), AMD (70.2%), others (16.6%)	An 8-week group program (once a week) 3 hours in duration at urban centers with provided transport. Each session led by rehabilitation counselors and included guest speakers and specialist training in various areas related to low vision. The program emphasized problem-solving skills and goal planning.	Usual care consist- ed of an optomet- ric assess- ment and prescrip- tion of op- tical aids and fur- ther train- ing provid- ed by the multidis- ciplinary team, as requested.	• AVL-MA • DASS- MA • GSES- MA • IVI-MA
Reeves 2004	Single site (participants' homes and the low-vision clinic, Man- chester Royal Eye Hospital), UK	12 months	226 150 (66.4%) fe- males	Median 81	NR	226 (100%)	Enhanced low-vision rehabilitation mod- el including supplementary home based low-vision rehabilitation up to 3 times by a trained rehabilitation officer.	Conven- tional low- vision re- habilita- tion	• NAS: Not- ting- ham Adjust- ment Scale- sum- mary • SF-36- sum- mary • VCM1- sum- mary

Table 1. Overview of included studies (Continued)

Riazi 2022	Multiple sites (recruitment from 5 County Council and London Borough Sensory Needs Services or through 6 NHS secondary services (Eye Hospitals/Eye Units) across London, South East and Central England), UK	9 months (intervention 8 weeks, measurements at 3, 6, and 9 months)	61 35 (57%) females	73.4 (SD 17.7)	NR	AMD (46%)	6 sessions of 45–60 minutes at home over 8 weeks delivered by a trained therapist. The sessions consisted of 7 stages representing discrete steps in either the treatment process or in the problem-solving process itself.	Routine medical care	• HADS • Independent Mobility-MA • IVIQ-MA • Life Spaces Questionnaire Score • GSES-MA • VISQOL-MA • WEMW-BS-MA
Rovner 2007	Single site (outpatient ophthalmology offices in Wills Eye Hospital, Philadelphia, Pennsylvania), USA	6 months	206 144 (70%) females	81.2 (SD 5.9)	0.60 (0.4)	NR	Problem-solving treatment plus usual care, 6 sessions (45–60 minutes long) during 8 weeks in participants' homes.	Usual care	• DSM-IV diagnosis • NEI VFQ-17-MA • HDRS-MA
Rovner 2013	Multiple sites (the retina clinics associated with the Wills Eye Institute in Philadelphia, Pennsylvania), USA	6 months (3 months – trial endpoint, 6 months – maintenance effects)	241 153 (63.5%) females	82.7 (SD 7.0)	0.58 (SD 0.29), best eye	AMD (100%)	Problem-solving therapy delivered by a problem-solving therapist. Mean number of sessions 5.8	Supportive therapy; mean number of sessions 5.9	• Activities inventory • PHQ-base-line only • NEI-VFQ-MA • TVF-MA

Table 1. Overview of included studies (Continued)

Rovner 2014	Single site (private retina practice associated with the Wills Eye Hospital, Philadelphia, Pennsylvania), USA	4 months	188 132 (70.2%) females	84.0 (SD 6.7)	0.67 (SD 0.37)	AMD (100%)	6 in-home 1-hour sessions over 8 weeks delivered by an occupational therapist focusing on the relationship between actions, mood, and mastery to enhance self-efficacy and social connections.	Supportive therapy plus low-vision rehabilitation. Supportive therapy delivered via 6 in-home 1-hour sessions over 8 weeks by a support therapist	• Activity Inventory • BADS • NEI-VFQ-MA • PHQ-9-MA • Adverse events-MA
Stelmack 2008	Multiple sites (2 sites, outpatient setting at 2 Veterans Affairs medical care facilities in Hines, Illinois, and Salisbury, North Carolina), USA	4 months (intervention 2 months, measurements taken 2 weeks after intervention at 4 months – 2 months after intervention)	126 3 (2%) females	78.9 (SD 7.9)	1.1 (SD 0.2)	Macular degeneration, macular dystrophy, macular hole, or inflammatory disease of the macula	Low-vision therapy services from an optometrist and a low-vision therapist; 5 weekly 2-hour sessions at the low-vision clinic to teach strategies for more effective use of remaining vision and use of low-vision devices; 1 home visit to teach environmental adaptations and to set up low-vision devices; 5 hours of homework per week after each therapy session to practice performing everyday tasks using the low-vision devices.	Wait list	• CES-D-MA • SF-36-MA • VA LV VFQ-48-MA • Adverse events-summary
Stelmack 2017	Multiple sites (9 Veterans Affairs medical facilities), USA	4 months	323 9 (2.8%) females	80 (SD 10.5)	0.6 (SD 0.2)	AMD (66%)	Basic low-vision services plus 1–3 therapy sessions including instruction in eccentric viewing, use of low-vision devices at near, intermediate, and far distances, environmental modification, integration of low-vision devices into lifestyle, and assigned homework to practice using low-vision devices for everyday tasks.	Dispensed low-vision devices without therapy or assigned homework.	• EQ-5D-MA • MN-READ-MA • SF-36 • VA LV VFQ-MA • Adverse events-summary

Table 1. Overview of included studies (Continued)

Tey 2019	Single site (low-vision clinics at the Singapore National Eye Centre (SNEC)), Singapore	6 months	165 (baseline data for 138) 50 (36.2%) females	60.2 (SD 11.3)	0.73 (SD 0.36)	Glaucoma (20%), DR (20%), AMD (4%), cataract (4%), others (52%)	4 × 3.5-hour weekly group sessions (6–8 participants each group), conducted over 4 consecutive weeks plus usual care.	Usual care	- DASS-MA - EQ-5D-MA - GSES-MA - IVI-28-MA - SF-12 physical composite scale-MA
van der Aa 2015	Multiple sites (3 rehabilitation organizations), Netherlands (2 sites) and Belgium (1 site)	24 months (measurements at 3, 6, 9, 12, 18, and 24 months)	265 185 (70%) females 172 (65%) with low vision	73.7 (SD 12.2)	NR	Glaucoma (17%), DR (3%), AMD (46%), cataract (17%), others (17%)	4 consecutive steps about 3 months each, including watchful waiting, guided self-help based on cognitive behavioral therapy, problem-solving treatment, and referral to the general practitioner; at the rehabilitation center or at home.	Usual care	- AVL-9-MA - LVQOL-18-MA - CES-D-MA - EQ-5D-MA - HADS-A
Vreeken 2020	Multiple sites (regional centers of 3 multidisciplinary low-vision services), Netherlands and Belgium	3 months (intervention 3–5 weeks)	131 68 (52%) females	81.6 (SD 10.0)	0.82 calculated by the median decimal visual acuity in the best eye of 0.15	Glaucoma (15%), AMD (59%), cataract (30%); some had multiple conditions	Intervention 3–5 weeks delivered by occupational therapists to participants and their communication partners at the participants' home, focusing on optimal use of hearing aids, home-environment modifications, and effective communication strategies.	Wait list	- CES-D-summary 'Adjustment' subscale of the LVQOL-summary

AMD: age-related macular degeneration; DR: diabetic retinopathy; logMAR: logarithm of the minimum angle of resolution; MA: meta-analysis; NHS: National Health Service; NR: not reported; SD: standard deviation.

Outcome measures

- ACS: Activity Card Sort

- ADL Step: Activities of Daily Living
- AMD-SEQ: Age-related Macular Degeneration Self-Efficacy Questionnaire
- AVL: Age-Related Vision Loss
- AVLS: Adaptation to Vision Loss Scale
- BADS: Behavioural activation for depression subscales
- CES-D: Center for Epidemiological Studies Depression scale
- DASS: Depression, Anxiety, Stress Scale
- DSM-IV: Diagnostic and Statistical Manual of Mental Disorders
- DSSI: the Duke Social Support Index for perceived social support
- EQ-5D: European Quality of Life Five Dimension
- FIMBA: Functional Independence Measure for Blind Adults, Living Skills, Orientation and Mobility Skills
- GAD-7: Generalized Anxiety Disorder 7-item scale, anxiety symptoms
- GDS: Geriatric Depression Scale
- GSES: Generalized Self-Efficacy Scale
- HADS: Hospital Anxiety and Depression Scale
- HDRS: Hamilton Depression Rating Scale
- IVI: Impact of Vision Impairment Questionnaire
- LOT-R: Life Orientation Test
- LVQOL: Low Vision Quality Of Life
- MN-READ: Minnesota Low-Vision Reading Test
- NAS: Nottingham Adjustment Scale
- NEI-VFQ: National Eye Institute Visual Function Questionnaire
- PHQ-9: Patient Health Questionnaire
- POMS: Profile of Mood States
- QWBS: Quality of Well-Being Scale
- SF-12: 12-Item Short Form Health Survey
- SF-36: 36-Item Short Form Health Survey
- TVF: Target Vision Function
- UCLA Loneliness Scale: University of California, Los Angeles Loneliness Scale
- VA LV VFQ-48: Veterans Affairs Low-Vision Visual Function
- VCM1: Vision Core Measure 1
- VISQOL: Vision and Quality of Life Index
- WEMWBS: Warwick-Edinburgh Mental Well-Being Scale