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Psychosocial interventions for improving quality of life outcomes in adults undergoing strabismus surgery (Review)

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Psychosocial interventions for improving quality of life outcomes in adults undergoing strabismus surgery

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ABSTRACT

Background

Strabismus, also known as squint, can have a debilitating effect on a person's self-esteem, quality of life and mood, as well as increase their feelings of social anxiety and avoidance behaviour. Strabismus surgery can improve both the alignment of a person's eyes and, in appropriate cases, relieve symptoms such as double vision. However, evidence indicates that not all patients experience a meaningful improvement in their quality of life postsurgery. Pre-surgical psychosocial interventions have been found to improve patient reported outcomes in other long-term conditions.

Objectives

To assess the effects of psychosocial interventions versus no intervention on quality of life and psychosocial outcomes in adults undergoing strabismus surgery.

Search methods

We searched CENTRAL (which contains the Cochrane Eyes and Vision group Trials Register) (2016, Issue 1), Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid MEDLINE Daily, Ovid OLDMEDLINE (January 1946 to February 2016), EMBASE (January 1980 to February 2016), Latin American and Caribbean Health Sciences (LILACS) (January 1982 to February 2016), PsycINFO (January 1967 to February 2016), the ISRCTN registry (www.isrctn.com/editAdvancedSearch), ClinicalTrials.gov (www.clinicaltrials.gov) and the World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (www.who.int/ictcp/search/en). We did not use any date or language restrictions in the electronic searches for trials. We last searched the electronic databases on 15 February 2016.

We also manually searched the *British Orthoptic Journal*, proceedings of the European Strabismological Association (ESA), International Strabismological Association (ISA) and published transactions from the meetings of European Strabismus Association (ESA) and American Association for Pediatric Ophthalmology and Strabismus (AAPOS). These were searched from 1980 to present. We also carried out handsearches of *Psychology and Health*, *British Journal of Health Psychology*, *Health Psychology* and *Annals of Behavioral Medicine*.

Selection criteria

We planned to include randomised controlled trials (RCTs), including cluster-RCTs, in which effectiveness of a psychosocial intervention had been evaluated in patients due to undergo strabismus surgery.

Data collection and analysis

Two review authors independently reviewed the search results for eligibility.

Main results

None of the 88 studies we identified met the inclusion criteria of this Cochrane review.

Authors' conclusions

We found no evidence that evaluated the impact of psychosocial interventions on patients undergoing squint surgery. We believe future research should focus on developing and evaluating the use of targeted psychosocial interventions to improve a patient's quality of life after strabismus surgery.

PLAIN LANGUAGE SUMMARY

Patient support programmes (psychosocial interventions) for improving quality of life in adults undergoing squint surgery

Background

Strabismus, also known as squint, is the misalignment of a person's eyes. It can result in an obvious squint noticeable by other people, as well as symptoms of double vision or blurred vision. Adults who have a squint often undergo surgery to alleviate these signs and symptoms. Although people report improvements in quality of life as a result of strabismus surgery, some people experience no change or a deterioration in quality of life, despite good clinical outcomes. Pre-surgery psychosocial interventions can improve patient reported outcomes in other long-term conditions. In this Cochrane review we aimed to evaluate the effectiveness of psychosocial interventions delivered prior to strabismus surgery in order to optimise quality of life postoperatively. We searched up to February 2016. We found no studies that evaluated the impact of psychosocial interventions on patients undergoing squint surgery. We believe future research should focus on developing and evaluating the use of targeted psychosocial interventions to improve a patient's quality of life after strabismus surgery.

BACKGROUND

Description of the condition

Strabismus, or squint, is a condition where a person's eyes are not aligned; it can be caused by a broad range of pathologies. Strabismus may be present constantly or intermittently, where a person's eyes are straight for some of the time. Whether the person has binocular functions (using both eyes together as a pair), or is able to suppress the image from the squinting eye, determines whether they will experience diplopia (double vision). In cases of constant squint that occurs before seven years of age, the brain usually inhibits the visual sensations of one eye in favour of the

other and thus it is unusual before this age to experience double vision. However, people that develop strabismus in adulthood often experience diplopia. Most squints can further be divided into esotropia (inward deviation) or exotropia (outward deviation). Less frequently people may have hypertropia (upward deviation), hypotropia (downward deviation) or, rarely, cyclodeviation (where the eye is rotated).

Strabismus is estimated to occur in approximately 4% of the adult population ([Beauchamp 2003](#)). There is significant evidence to show that having a squint is associated with negative psychosocial effects and impacts on all aspects of these people's lives ([Wen 2011](#)). Even in cases where the squint is intermittent, people report reduced health-related quality of life outcomes, such as negative feelings, general disability and problems with eye contact and

interpersonal relationships, compared to the general population (Hatt 2010). People with strabismus have been found to experience significantly lower quality of life overall (McBain 2014) and in terms of functional and psychosocial subscales compared to the general adult population and patients with other eye conditions (Hatt 2009). Poorer quality of life in strabismus patients has been associated with being female, of a lower socio-economic status (Durnian 2011), increased feelings of social anxiety and participating in more socially avoidant coping strategies (Durnian 2009). Given the effect strabismus has on a person's appearance and visual function, the impact on their psychological functioning is unsurprising. Adults with strabismus experience higher levels of anxiety compared to the general population (Jackson 2006; Klauer 2000; McBain 2014) and people hold negative attitudes towards people with strabismus (Paysse 2001). These prejudices have a negative effect on socialisation (Olitsky 1999) and employability, particularly for women (Coats 2000). Satterfield 1993 found that living with strabismus affects friendships and securing work. Strabismus sufferers can also experience ridicule or abuse during childhood. This may have a negative effect on their self image and lead to some adults using adaptive techniques to hide their strabismus. There are both surgical and non-surgical treatment options for some types of strabismus, including optical correction, such as glasses and prisms, as well as pharmacological therapies, such as botulinum toxin. In cases where patients' squints are unassociated with double vision, surgical correction has less impact on visual function and is performed in order to correct alignment. In other cases patients may experience debilitating double vision, meaning that they have mixed functional and cosmetic aspects to their strabismus, both of which may be corrected by surgery. Assessment of surgical success has been traditionally measured clinically, by objective measures of ocular deviation and functional improvements. However, this fails to acknowledge the impact on a person's quality of life and the impact strabismus can have on their psychological well-being. For those patients who are aligned clinically postsurgery, quality of life has been shown to improve (Hatt 2010), particularly so for those without double vision before surgery (Jackson 2006). These postsurgical gains have also been shown to rise continually for up to one year postsurgery (Hatt 2012). A recent review provides a comparison of the main health-related quality of life measures used in this field (Carlton 2011). However, in all of these studies, although the quality of life of strabismus patients is lower than the general population, the data show considerable variation with some patients doing better than others. In fact, there are a group of patients for whom surgery does not improve quality of life despite surgery being clinically successful. This variation would suggest that factors other than clinical measurements play a role in improving outcomes for patients undergoing strabismus surgery. Hence, psychosocial interventions in these individuals in addition to surgery may be a potentially useful tool to improve quality of life postsurgery and patient satisfaction with surgical intervention.

Description of the intervention

Psychosocial interventions have been implemented with success in people with a number of different conditions, including cancer (Rehse 2003), chronic lower back pain (Hoffman 2007), diabetes (Steed 2003) and coronary artery disease (Linden 1996), with statistically and clinically significant improvements in quality of life reported in all reviews. Although structured psychosocial interventions for patients prior to surgery have been the focus of less research, some early work has shown improvements in patients' psychological well-being postoperatively (Johnston 1993). Psychosocial interventions have been defined as any programme that incorporates techniques that aim to reduce psychosocial distress. Due to this broad definition, the content of these interventions is extremely diverse and can include anything from basic education through to self management, cognitive behavioural therapy (CBT) and social support. These interventions are wide ranging in their theoretical background, complexity, content and mode of delivery.

How the intervention might work

As psychosocial interventions differ in their theoretical underpinnings, the proposed mechanisms through which these interventions work differ. Patient education programmes typically provide information about the disease, treatment and what to expect after surgery, and provide advice about what the patient needs to do to manage the outcomes of their surgery effectively. The main reason for providing education has been to reduce people's anxiety by decreasing uncertainty about aspects of the condition and feelings of helplessness by giving people control over aspects of the procedure and recovery. However, it is more common for patient education to be incorporated into other types of interventions as the provision of information alone is not usually sufficient to bring about significant long-term benefits for the patient (Gibson 2002). Self management interventions provide people with the information they need to manage the situation but rather than using a didactic approach to delivering the information a more patient-centred approach is used, where the patient's beliefs about the illness are elicited first. This helps to understand the patient's perspective and any barriers which may be preventing them from putting the advice into practice. In CBT, cognitive processes are thought to mediate the relationship between emotions and behaviour, therefore clinicians will work with clients on either a group or individual basis to understand the link between their thoughts, feelings and how they behave. The primary aim is to identify current maladaptive cognitions, challenge them and reformulate thoughts to generate new balanced and adaptive strategies. By using cognitive restructuring exercises, individuals increasingly recognise how their emotions, cognitions and interpretations modulate their view of their condition in positive and negative directions. As a result, it is hoped that individuals will be better able to manage their be-

haviour and thoughts as related to their condition. Effective social support from family and friends can be an integral part of improving outcomes for patients. This may be by enabling them to understand the link between the patient's thoughts, feelings and behaviour or by attending to their own perceptions and misperceptions of the situation. Negative support can be just as detrimental as no support, therefore social support interventions may work to either intervene in current relationships and networks in order to improve their responsiveness or introduce the individual to new social ties which may be able to provide more appropriate support.

Why it is important to do this review

The psychosocial impact of strabismus has gathered increasing recognition and interest in the last decade. There is evidence to suggest that the presence of a squint lowers a person's quality of life and self esteem, and increases levels of anxiety, depression, social avoidance and social anxiety (McBain 2014). In addition, strabismus can also adversely affect a person's employment opportunities, friendships and partner selection (Satterfield 1993). Many people adopt behavioural techniques to conceal their strabismus, such as wearing glasses and assuming certain head positions. Although studies have identified the psychological and social impact of strabismus and shown that quality of life can improve following surgery, this does not happen for all patients. It frequently does not reach the general population level and some negative consequences of the squint remain. There has been minimal research into which factors contribute to these adjustment difficulties and hence the development of suitable interventions to address these issues is minimal. Therefore a systematic review in this area will help assess the existing evidence base and provide a useful platform to identify further research needed to expand our knowledge in this area.

OBJECTIVES

To investigate the effects of psychosocial interventions versus no intervention on quality of life and psychosocial outcomes in adults undergoing strabismus surgery.

METHODS

Criteria for considering studies for this review

Types of studies

We planned to include randomised controlled trials (RCTs) and cluster-RCTs. We planned to include studies of parallel-group design, but exclude cross-over trials.

Types of participants

Any adult patient with strabismus from 18 years or over with no upper age limit. The strabismus could be of any cause and include congenital, infantile, childhood onset, acquired in later life or secondary to other causes.

We set no restriction on the time frame from onset of strabismus to time of intervention.

We excluded patients with psychological problems from other causes or patients who had previously undergone a psychosocial intervention.

Types of interventions

Any intervention that attempted to address the negative psychosocial effects associated with strabismus versus no intervention.

Types of outcome measures

Primary outcomes

Improvement in quality of life, as measured by self administered quality of life questionnaires, between three to six months following surgery, and one year or more where available. We planned to use vision-specific instruments such as the Visual Function Questionnaire (VFQ-25), National Eye Institute Visual Function Questionnaire (NEI-VFQ) and Visual Function-14 (VF 14), strabismus-specific such as Adult Strabismus-20 (AS-20) and Amblyopia and Strabismus Questionnaire (A&SQ), and generic measures such as Short Form (SF) 8,12 and 36 and EuroQoL-5D (EQ5D). We gave preference to questionnaires which were published, showed construct validity and are widely used.

Secondary outcomes

- anxiety
- depression
- social anxiety and social avoidance
- degree of success in terms of desired surgical outcome, as determined by size of angle of ocular deviation following surgery. We considered this successful if within 10 prism dioptres of emmetropia and absence of diplopia in the primary position and in downgaze/reading.

Search methods for identification of studies

Electronic searches

We searched CENTRAL (which contains the Cochrane Eyes and Vision group Trials Register) (2016, Issue 1), Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid MEDLINE Daily, Ovid OLDMEDLINE (January 1946 to February 2016), EMBASE (January 1980 to February 2016), Latin American and Caribbean Health Sciences (LILACS) (January 1982 to February 2016), PsycINFO (January 1967 to February 2016), the ISRCTN registry (www.isrctn.com/editAdvancedSearch), ClinicalTrials.gov (www.clinicaltrials.gov) and the World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (www.who.int/ictcp/search/en). We did not use any date or language restrictions in the electronic searches for trials. We last searched the electronic databases on 15 February 2016.

See: Appendices for details of search strategies for CENTRAL (Appendix 1), MEDLINE (Appendix 2), EMBASE (Appendix 3), LILACS (Appendix 4), PsycINFO (Appendix 5), ISRCTN (Appendix 6), ClinicalTrials.gov (Appendix 7) and the ICTRP (Appendix 8).

Searching other resources

We manually searched the *British Orthoptic Journal*, proceedings of the European Strabismological Association (ESA), International Strabismological Association (ISA) and published transactions from the meetings of European Strabismus Association (ESA) and American Association for Pediatric Ophthalmology and Strabismus (AAPOS) from 1980 to present. We also handsearched *Psychology and Health*, *British Journal of Health Psychology*, *Health Psychology* and *Annals of Behavioral Medicine*.

Data collection and analysis

Selection of studies

Two review authors (KM and JH) independently assessed study abstracts identified from electronic and manual searches to establish whether they met the inclusion criteria and defined them as either included, excluded or unsure. Included papers encompassed RCTs; excluded papers encompassed case reports. In cases where the two review authors did not agree following discussion, we reached a majority decision between all review authors. Following this, we obtained full copies of definitely or potentially relevant studies. Where information was unclear, we contacted the study authors.

Data extraction and management

Two review authors (KM and JH) planned to independently extract information relating to outcomes using paper data collection forms developed by Cochrane Eyes and Vision (CEV). We planned to resolve discrepancies by discussion. In cases where there was still a discrepancy we planned to resolve by discussion between all review authors.

We planned to extract the following details from included trials:

- Methods: inclusion criteria, exclusion criteria and follow-up period
- Participants: age, type of strabismus, size of strabismus and previous treatment
- Interventions: type of psychological intervention and period of intervention
- Outcomes: quality of life and success of surgery in reducing ocular deviation
- Adverse events: such as complications associated with surgery, including unintentional over or under correction of the deviation, diplopia, slipped muscle and visual loss

If questionnaires have different methods for scoring, we planned to standardise these before comparison from 0% to 100%.

Assessment of risk of bias in included studies

We planned to assess study quality according to the methods set out in Chapter 8 of the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011). We planned to use Cochrane's 'Risk of bias' assessment tool.

We planned to assess allocation bias by examining sequence generation and allocation concealment. It was not possible for participants or personnel to be masked to the psychological treatment modality. However we planned to assess other potential sources of bias, such as incomplete outcome data and selective reporting. Outcome measures, in terms of quality of life as measured by validated quality of life questionnaires (as detailed above), should be self completed by patients and not with the assistance of staff as this may induce detection bias if staff have knowledge of which group patients are in.

Outcome measure in terms of improvement in eye position and absence of diplopia, as assessed by standard orthoptic clinical measurements, should be assessed by an individual not involved directly in the surgery to reduce bias.

Measures of treatment effect

For assessment of psychological treatment effect in terms of reported quality of life measures on validated questionnaires we planned to use standardised mean difference for continuous data, following assessment of normality using normal quartile plots.

For assessment of surgical treatment effect we planned to consider odds ratio or risk ratio for dichotomous data relating to presence

or absence of diplopia and standardised mean difference for continuous data relating to change in size of angle of ocular deviation. We planned to stratify trials according to preoperative diplopia.

Unit of analysis issues

When analysing the outcome measures of studies, we planned to do so on a group and not an individual basis. Where individual results were reported we planned to derive appropriate summary statistics to allow data comparison before analysis.

The surgical outcome measure was the change in ocular alignment and was unaffected by whether one or both eyes had been operated upon. The quality of life measures were also unrelated to whether one or both eyes were affected.

Dealing with missing data

We planned to contact the authors of included trials to obtain missing data. If there was no response after one month we planned to contact them again. We allowed a total of three months for a response. If we did not receive any response from the trial authors we planned to record this as missing data.

Assessment of heterogeneity

We did not expect there to be significant heterogeneity in data synthesis for a given outcome measure. We planned to use the I^2 statistic to quantify inconsistency in study population, type of strabismus and type of psychological intervention and the impact on meta-analysis. We planned to assess heterogeneity as specified in Chapter 9 of the *Cochrane Handbook for Systematic Reviews of Interventions* (Deeks 2011):

- 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

Assessment of reporting biases

If a sufficient number of trials met the inclusion criteria (10 or more), we planned to use a funnel plot to assess reporting bias.

Data synthesis

If there was no evidence of heterogeneity we planned to use the fixed-effect model. If we had found significant heterogeneity we planned to give a descriptive summary of the results.

Subgroup analysis and investigation of heterogeneity

If enough studies met the inclusion criteria, we planned to undertake a subgroup analysis of the effects of different psychological interventions and their effect on strabismus.

Sensitivity analysis

If appropriate, we planned to undertake a sensitivity analysis to assess the effect of excluding trials that have missing data.

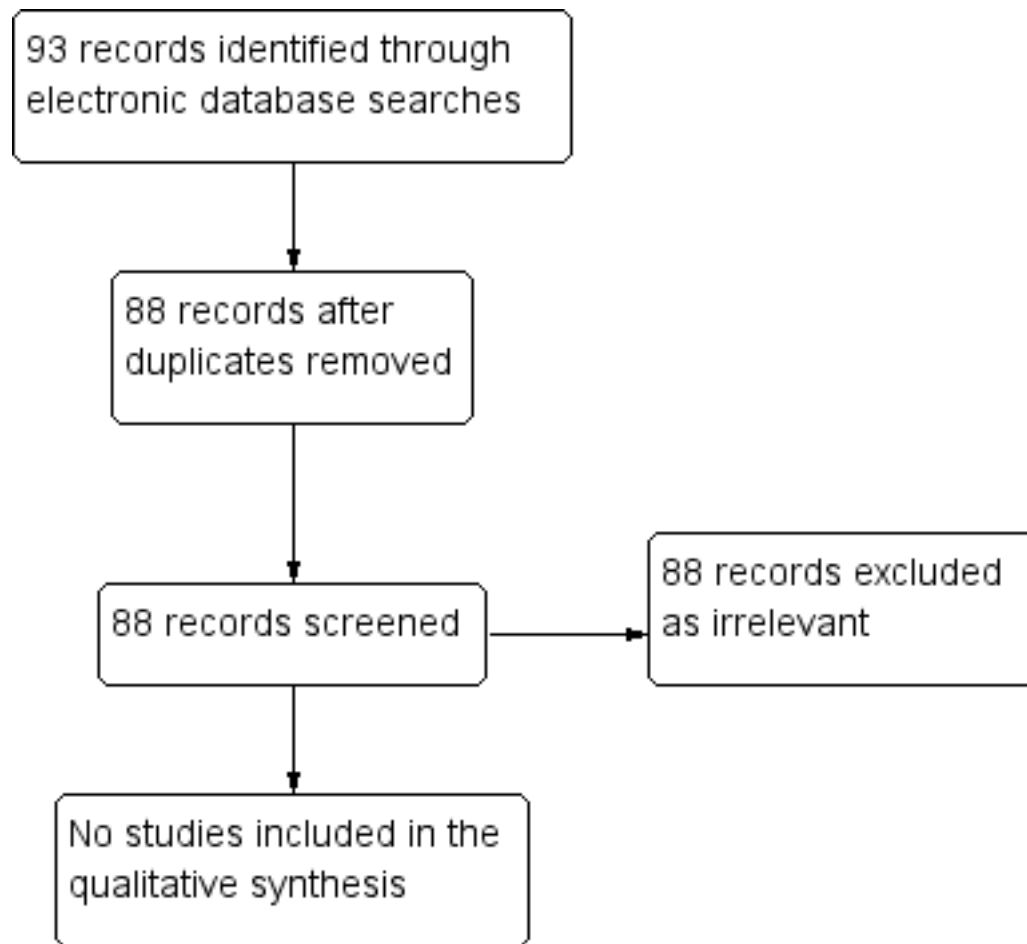
RESULTS

Description of studies

Results of the search

The electronic database search yielded a total of 93 references (Figure 1). The Information Specialist removed five duplicates, and we screened the remaining 88 reports to identify potentially relevant studies. Two review authors independently screened all reports to identify potentially relevant studies for inclusion in this review. None of these reports were relevant to the scope of this Cochrane review.

Figure 1. Study flow diagram.



Included studies

We did not find any RCTs that met the inclusion criteria.

Excluded studies

No studies met the inclusion criteria.

Risk of bias in included studies

No RCTs were eligible for inclusion.

Effects of interventions

We did not identify any studies from our searches that were eligible for inclusion, which highlights a gap in existing evidence for the psychosocial support of strabismic patients.

DISCUSSION

In this Cochrane review we aimed to investigate whether participation in a psychosocial intervention prior to strabismus surgery could optimise postsurgery quality of life. We did not identify any studies that met the inclusion criteria. Hence evidence of the effectiveness of psychosocial interventions to support patients undergoing strabismus surgery is lacking.

AUTHORS' CONCLUSIONS

Implications for practice

We were unable to draw any reliable conclusions due to the lack of randomised controlled trials (RCTs) in this field that met the inclusion criteria of this Cochrane review.

Implications for research

Given the variation in quality of life poststrabismus surgery there is a definite need to develop and evaluate psychosocial interventions in order to prepare people for surgery, with the overall aim of optimising outcomes for patients. The first step in developing such an intervention is conducting research that would provide an understanding of the factors that contribute towards improved quality of life poststrabismus surgery. This would identify which patients are more likely to experience poorer outcomes postsurgery so that interventions can be targeted appropriately and also what psychosocial processes would need to be targeted within an intervention in order to improve quality of life. Once this has been

established, we believe future research should focus on developing these targeted psychosocial interventions and comparing their effects with usual care in RCTs.

ACKNOWLEDGEMENTS

Cochrane Eyes and Vision (CEV) devised the search strategies for this Cochrane review and executed the electronic searches. We thank Catey Bunce, Richard Harrad and Nan Zhang for their comments on the protocol (Hancox 2012) or review and Anupa Shah, Managing Editor of the CEV for her assistance throughout the editorial process.

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- * Indicates the major publication for the study

DATA AND ANALYSES

This review has no analyses.

APPENDICES

Appendix I. CENTRAL search strategy

- #1 MeSH descriptor Strabismus
- #2 esotrop* or exotrop*
- #3 hyperptrop* or hypotrop*
- #4 strabism* or squint*
- #5 (eye* or ocular) near/3 deviat*
- #6 (eye* or ocular) near/3 disfigur*
- #7 MeSH descriptor Oculomotor Muscles
- #8 MeSH descriptor Oculomotor Nerve Diseases
- #9 MeSH descriptor Trochlear Nerve Diseases
- #10 MeSH descriptor Abducens Nerve Diseases
- #11 (third or fourth or sixth) near/2 nerve palsy
- #12 (3rd or 4th or 6th) near/2 nerve palsy
- #13 extraocular near/2 muscle near/2 surg*
- #14 (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13)
- #15 MeSH descriptor Cognitive Therapy
- #16 MeSH descriptor Behavior Therapy
- #17 cognitive behavio* therapy or CBT
- #18 MeSH descriptor Psychotherapy, Group
- #19 psychotherap*
- #20 psychoeducat* or patient education
- #21 (intervention* or therap* or treat*) near/2 psychological
- #22 (intervention* or therap* or treat*) adj2 psychosocial
- #23 MeSH descriptor Counseling
- #24 counselling or counseling
- #25 MeSH descriptor Relaxation Therapy
- #26 (group or therap* or treat*) near/2 relaxation
- #27 MeSH descriptor Problem Solving
- #28 problem solving
- #29 stress management
- #30 self management
- #31 (#15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30)
- #32 (#14 AND #31)

Appendix 2. MEDLINE (Ovid) search strategy

1. randomized controlled trial.pt.
2. (randomized or randomised).ab,ti.
3. placebo.ab,ti.
4. dt.fs.
5. randomly.ab,ti.
6. trial.ab,ti.
7. groups.ab,ti.
8. or/1-7
9. exp animals/
10. exp humans/
11. 9 not (9 and 10)
12. 8 not 11
13. exp strabismus/
14. (esotrop\$ or exotrop\$).tw.
15. (hyperptrop\$ or hypotrop\$).tw.
16. (strabism\$ or squint\$).tw.
17. ((eye\$ or ocular) adj3 deviat\$).tw.
18. ((eye\$ or ocular) adj3 disfigur\$).tw.
19. oculomotor muscles/
20. oculomotor nerve diseases/
21. trochlear nerve diseases/
22. abducens nerve diseases/
23. ((third or fourth or sixth) adj2 nerve palsy).tw.
24. ((3rd or 4th or 6th) adj2 nerve palsy).tw.
25. (extraocular adj2 muscle adj2 surg\$).tw.
26. or/13-25
27. Cognitive Therapy/
28. Behavior Therapy/
29. (cognitive behavio\$ therapy or CBT).tw.
30. Psychotherapy, Group/
31. psychotherap\$.tw.
32. (psychoeducat\$ or patient education).tw.
33. ((intervention\$ or therap\$ or treat\$) adj2 psychological).tw.
34. ((intervention\$ or therap\$ or treat\$) adj2 psychosocial).tw.
35. counseling/
36. (counseling or counselling).tw.
37. Relaxation Therapy/
38. ((group or therap\$ or treat\$) adj2 relaxation).tw.
39. Problem Solving/
40. problem solving.tw.
41. stress management.tw.
42. self management.tw.
43. coping skills.tw.
44. or/27-43
45. 26 and 44
46. 12 and 45

The search filter for trials at the beginning of the MEDLINE strategy is from the published paper by Glanville ([Glanville 2006](#)).

Appendix 3. EMBASE (Ovid) search strategy

1. exp randomized controlled trial/
2. exp randomization/
3. exp double blind procedure/
4. exp single blind procedure/
5. random\$.tw.
6. or/1-5
7. (animal or animal experiment).sh.
8. human.sh.
9. 7 and 8
10. 7 not 9
11. 6 not 10
12. exp clinical trial/
13. (clin\$ adj3 trial\$).tw.
14. ((singl\$ or doubl\$ or trebl\$ or tripl\$) adj3 (blind\$ or mask\$)).tw.
15. exp placebo/
16. placebo\$.tw.
17. random\$.tw.
18. exp experimental design/
19. exp crossover procedure/
20. exp control group/
21. exp latin square design/
22. or/12-21
23. 22 not 10
24. 23 not 11
25. exp comparative study/
26. exp evaluation/
27. exp prospective study/
28. (control\$ or prospectiv\$ or volunteer\$).tw.
29. or/25-28
30. 29 not 10
31. 30 not (11 or 23)
32. 11 or 24 or 31
33. strabismus surgery/
34. (esotrop\$ or exotrop\$).tw.
35. (hyerptrop\$ or hypotrop\$).tw.
36. (strabism\$ or squint\$).tw.
37. ((eye\$ or ocular) adj3 deviat\$).tw.
38. ((eye\$ or ocular) adj3 disfigur\$).tw.
39. extraocular muscle/
40. oculomotor nerve disease/
41. trochlear nerve disease/
42. abducens nerve disease/
43. ((third or fourth or sixth) adj2 nerve palsy).tw.
44. ((3rd or 4th or 6th) adj2 nerve palsy).tw.
45. (extraocular adj2 muscle adj2 surg\$).tw.
46. or/33-45
47. exp psychotherapy/
48. (cognitive behavio\$ therapy or CBT).tw.
49. psychotherap\$.tw.
50. (psychoeducat\$ or patient education).tw.
51. ((intervention\$ or therap\$ or treat\$) adj2 psychological).tw.

52. ((intervention\$ or therap\$ or treat\$) adj2 psychosocial).tw.
53. counseling/
54. (counseling or counselling).tw.
55. relaxation training/
56. ((group or therap\$ or treat\$) adj2 relaxation).tw.
57. problem solving/
58. problem solving.tw.
59. stress management/
60. stress management.tw.
61. self care/
62. self management.tw.
63. coping skills.tw.
64. or/47-63
65. 46 and 64
66. 32 and 65

Appendix 4. LILACS search strategy

strabismus and psychosocial or psychotherapy or cognitive or behavioural or counselling or counseling

Appendix 5. PsycINFO search strategy

1. exp Strabismus/
2. (esotrop\$ or exotrop\$).tw.
3. (hyperptrop\$ or hypotrop\$).tw.
4. (strabism\$ or squint\$).tw.
5. ((eye\$ or ocular) adj3 deviat\$).tw.
6. ((eye\$ or ocular) adj3 disfigur\$).tw.
7. Oculomotor Muscles/
8. ((third or fourth or sixth) adj2 nerve palsy).tw.
9. ((3rd or 4th or 6th) adj2 nerve palsy).tw.
10. (extraocular adj2 muscle adj2 surg\$).tw.
11. or/1-10
12. Cognitive Techniques/
13. Cognitive Therapy/
14. Behavior Therapy/
15. (cognitive behavio\$ therapy or CBT).tw.
16. Group Psychotherapy/
17. psychotherap\$.tw.
18. (psychoeducat\$ or patient education).tw.
19. ((intervention\$ or therap\$ or treat\$) adj2 psychological).tw.
20. ((intervention\$ or therap\$ or treat\$) adj2 psychosocial).tw.
21. exp Counseling/
22. exp Psychotherapeutic Counseling/
23. (counseling or counselling).tw.
24. Relaxation Therapy/
25. ((group or therap\$ or treat\$) adj2 relaxation).tw.
26. Problem Solving/
27. problem solving.tw.
28. Stress Management/
29. stress management.tw.
30. self management.tw.

31. exp Coping Behavior/
32. coping skills.tw.
33. or/12-32
34. 11 and 33

Appendix 6. ISRCTN search strategy

“strabismus AND (psychosocial OR psychotherapy OR cognitive OR behavioural OR counselling)”

Appendix 7. ClinicalTrials.gov search strategy

strabismus AND (psychosocial OR psychotherapy OR cognitive OR behavioural OR counselling)

Appendix 8. ICTRP search strategy

Strabismus = Condition AND Psychosocial OR Psychotherapy OR Cognitive OR Behavioural OR Counselling = Intervention

HISTORY

Protocol first published: Issue 9, 2012

Review first published: Issue 5, 2016

Date	Event	Description
29 July 2015	New citation required but conclusions have not changed	This protocol was previously withdrawn but has now been republished as the review author team are actively working on the review

CONTRIBUTIONS OF AUTHORS

JH, KM, DE, HM, GA and SN conceived the review.

JH, KM, DE, HM, GA and SN designed the review.

KM and JH coordinated the review.

KM and JH screened search results.

KM, JH, HM, DE, GA and SN wrote the review.

JH, KM and HM responded to comments from the CEV editorial base.

DECLARATIONS OF INTEREST

JH has no known conflict of interests

KM has no known conflict of interests

DE has no known conflict of interests

HM has no known conflict of interests

GA has no known conflict of interests

SN has no known conflict of interests

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The views expressed in this publication are those of the review authors and not necessarily those of the NIHR, NHS or the Department of Health.

INDEX TERMS

Medical Subject Headings (MeSH)

*Quality of Life; Strabismus [psychology; *surgery]

MeSH check words

Adult; Humans