

NKR46 pico 10: physical activity for anorexia

Review information

Authors

Danish Health Authority¹¹[Empty affiliation]

Citation example: DHA. NKR46 pico 10: physical activity for anorexia. Cochrane Database of Systematic Reviews [Year], Issue [Issue].

Characteristics of studies

Characteristics of included studies

Carei 2010

| | |
|----------------------|---|
| Methods | Study design: Randomized controlled trial Study grouping: Parallel group Open Label: Cluster RCT: |
| Participants | Baseline Characteristics Intervention <ul style="list-style-type: none"> ● <i>Age (SD):</i> 16.52 (2.35) ● <i>Sex (% female):</i> 92 ● <i>BMI (SD):</i> 19.51 (3.01) ● <i>AN (% of sample):</i> 55 ● <i>Duration of illness (months):</i> 14.3 (16.7) ● <i>Comorbidity (% of sample):</i> n/a ● <i>Psychotropic medication (% of sample):</i> n/a Control <ul style="list-style-type: none"> ● <i>Age (SD):</i> as intervention ● <i>Sex (% female):</i> as intervention ● <i>BMI (SD):</i> 18.88 (2.32) ● <i>AN (% of sample):</i> as intervention ● <i>Duration of illness (months):</i> as intervention ● <i>Comorbidity (% of sample):</i> as intervention ● <i>Psychotropic medication (% of sample):</i> as intervention <p>Included criteria: age between 10 and 21 years, and DSM-IV criteria met for AN, BN, and/or EDNOS. Excluded criteria: resting pulse less than 44 beats per minute, physical inability to participate in yoga as determined by the referring health care provider, and a comorbid DSM-IV diagnosis of psychotic disorder, conversion disorder, substance-related disorder, and/or an Axis II disorder. Pretreatment: There were no significant differences between the NoYoga group and the Yoga group on any of the variables described in this demographics section, indicating that random assignment was successful in evenly distributing third variables. As there were no significant differences, all participants are described in the preliminary analyses without respect to treatment group.</p> |
| Interventions | Intervention Characteristics Intervention <ul style="list-style-type: none"> ● <i>Description:</i> Participants received 1 hour of yoga twice a week for 8 consecutive weeks (1:1 instruction). + TAU ● <i>Manual-based:</i> yes ● <i>Duration (weeks):</i> 8 ● <i>Number of sessions:</i> 16 Control <ul style="list-style-type: none"> ● <i>Description:</i> TAU: All participants received standard medical care regardless of group assignment. This included appointments with a physician and dietician every other week. Weight, height, vital signs, body mass index (BMI), nutritional habits, and menstrual status were monitored at these visits. ● <i>Manual-based:</i> no ● <i>Duration (weeks):</i> 8 ● <i>Number of sessions:</i> 4 |
| Outcomes | <i>ED behavior (end of treatment)</i> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <i>ED behavior (longest FU)</i> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <i>Body weight (end of treatment)</i> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome ● Reporting: Fully reported ● Scale: BMI ● Direction: Higher is better ● Data value: Endpoint <i>Body weight (longest FU)</i> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome |

| | |
|-----------------------|---|
| | <ul style="list-style-type: none"> ● Reporting: Fully reported ● Scale: BMI ● Direction: Higher is better ● Data value: Endpoint <p><i>Psychological symptoms (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome ● Reporting: Fully reported ● Scale: EDE global ● Range: 0-6 ● Direction: Lower is better ● Data value: Endpoint <p><i>Psychological symptoms (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome ● Reporting: Fully reported ● Scale: EDE global ● Range: 0-6 ● Direction: Lower is better ● Data value: Endpoint <p><i>Recovery rate (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: DichotomousOutcome <p><i>Dropout</i></p> <ul style="list-style-type: none"> ● Outcome type: DichotomousOutcome ● Reporting: Fully reported ● Direction: Lower is better ● Data value: Endpoint <p><i>Quality of life (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>Hospitalizations (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: DichotomousOutcome ● Reporting: Fully reported ● Direction: Lower is better ● Data value: Endpoint |
| Identification | <p>Sponsorship source: Newman, the Complementary Alternative Medicine Grant, and by Grant NumberUL1RR025014-1 from the National Center for Research Resources, a component of the National Institutes of Health.</p> <p>Country: Seattle, USA</p> <p>Setting: outpatient treatment</p> <p>Comments: none</p> <p>Authors name: T. Rain Carei</p> <p>Institution: Treatment Evaluation Center, Washington Corrections Center for Women</p> <p>Email: trcarei@doc1.wa.sov</p> <p>Address: 9601 Bujacich Road NW, Gig Harbor, WA 98335.</p> |
| Notes | <p><i>Nkr 46 Anoreksi</i> on 17/03/2016 06:58 Population Age, sex, and duration of illness reported for the group as a whole.</p> <p><i>Nkr 46 Anoreksi</i> on 17/03/2016 07:12 Outcomes Longest FU after one month.</p> <p><i>Louise Linde</i> on 18/03/2016 05:48 Population Age, % female, % AN, Duration of illness er oppgivet samlet.</p> <p><i>Louise Linde</i> on 18/03/2016 06:06 Outcomes Longest FU 4 uger EOT</p> |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|--|--------------------|---|
| Allocation concealment | Low risk | Judgement Comment: The randomization sequence was generated independently by biostatisticians at Seattle Children's Hospital. |
| Blinding of participants and personnel | High risk | |
| Blinding of outcome assessors | Unclear risk | Judgement Comment: No description of EDE assessment. Only description of blinded assessors for food preoccupation. |
| Selective outcome reporting | Low risk | |

| | | |
|-------------------------|----------|---|
| Sequence Generation | Low risk | Judgement Comment: Participants were randomized to two treatment conditions using a stratified,permutated block scheme. |
| Incomplete outcome data | Low risk | |
| Other sources of bias | Low risk | |

Catalan Matamoros 2011

| | |
|----------------------|--|
| Methods | <p>Study design: Randomized controlled trial</p> <p>Study grouping: Parallel group</p> <p>Open Label:</p> <p>Cluster RCT:</p> |
| Participants | <p>Baseline Characteristics</p> <p>Intervention</p> <ul style="list-style-type: none"> ● <i>Age (SD):</i> 29.5 ● <i>Sex (% female):</i> 92.9 ● <i>BMI (SD):</i> n/a ● <i>AN (% of sample):</i> 42.8 ● <i>Duration of illness (months):</i> 42 (18) ● <i>Comorbidity (% of sample):</i> n/a ● <i>Psychotropic medication (% of sample):</i> 64.3 <p>Control</p> <ul style="list-style-type: none"> ● <i>Age (SD):</i> 25.2 ● <i>Sex (% female):</i> 87.5 ● <i>BMI (SD):</i> n/a ● <i>AN (% of sample):</i> 62.5 ● <i>Duration of illness (months):</i> 43 (17) ● <i>Comorbidity (% of sample):</i> n/a ● <i>Psychotropic medication (% of sample):</i> 37.5 <p>Included criteria: registered with any of the diagnoses of eating disorders; in outpatient treatment; diagnosed less than 5 years ago; enough physical skills in order to stay in different positions (laying, sitting and standing); over 18 years old.</p> <p>Excluded criteria: None described.</p> <p>Pretreatment: No significant differences in relation to the descriptive items were found between the groups.</p> |
| Interventions | <p>Intervention Characteristics</p> <p>Intervention</p> <ul style="list-style-type: none"> ● <i>Description:</i> TAU + Basic Body Awareness Therapy programme.1) Encounter between the patient and the physiotherapist2) Exercises in lying position3) Exercises in sitting position4) Exercises in standing position5) Push-hands and walking exercises6) Session ending ● <i>Manual-based:</i> no ● <i>Duration (weeks):</i> 7 ● <i>Number of sessions:</i> 12 (1 individual one-hour session per week the first two weeks. In the following five weeks, the patients received two group sessions of 1.5 hours each per week. <p>Control</p> <ul style="list-style-type: none"> ● <i>Description:</i> All patients received standard outpatient treatment which consisted of psychotherapy and psychiatry. ● <i>Manual-based:</i> n/a ● <i>Duration (weeks):</i> 7 ● <i>Number of sessions:</i> n/a |
| Outcomes | <p><i>ED behavior (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>ED behavior (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>Body weight (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>Body weight (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>Psychological symptoms (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>Psychological symptoms (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>Recovery rate (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: DichotomousOutcome <p><i>Dropout</i></p> <ul style="list-style-type: none"> ● Outcome type: DichotomousOutcome <p><i>Quality of life (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>Hospitalizations (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: DichotomousOutcome |

| | |
|-----------------------|---|
| Identification | <p>Sponsorship source: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.</p> <p>Country: Spain</p> <p>Setting: Outpatient treatment.</p> <p>Comments: none</p> <p>Authors name: Daniel Catalan-Matamoros</p> <p>Institution: Department of Nursing and Physiotherapy, University of Almeri'a, Spain</p> <p>Email: dcatalan@ual.es</p> <p>Address: Department of Nursing and Physiotherapy, University of Almeri'a, Crta. Sacramento s/n, 04120 Almeri'a, Spain</p> |
| Notes | <p>Nkr 46 Anoreksi on 16/03/2016 04:08</p> <p>Select 50% AN population</p> <p>Louise Linde on 18/03/2016 21:12</p> <p>Outcomes QoL er brugt SF-36 mental health og efter EOT</p> |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|--|--------------------|---|
| Allocation concealment | Low risk | Judgement Comment: After screening by the study coordinator, participants were randomly assigned by the sealed envelope method into two groups. |
| Blinding of participants and personnel | High risk | |
| Blinding of outcome assessors | Unclear risk | Judgement Comment: Self-report and dropout can be affected by allocated treatment arm with no blinding. |
| Selective outcome reporting | Low risk | |
| Sequence Generation | Low risk | Judgement Comment: After screening by the study coordinator, participants were randomly assigned by the sealed envelope method into two groups. |
| Incomplete outcome data | High risk | Judgement Comment: High dropout from control group. |
| Other sources of bias | High risk | |

Chantler 2006

| | |
|----------------------|---|
| Methods | <p>Study design: Randomized controlled trial</p> <p>Study grouping: Parallel group</p> <p>Open Label:</p> <p>Cluster RCT:</p> |
| Participants | <p>Baseline Characteristics</p> <p>Intervention</p> <ul style="list-style-type: none"> ● Age (SD): 20 (5) ● Sex (% female): 100 ● BMI (SD): 15.1 (1.1) ● AN (% of sample): 100 ● Duration of illness (months): 72 (24) ● Comorbidity (% of sample): n/a ● Psychotropic medication (% of sample): n/a <p>Control</p> <ul style="list-style-type: none"> ● Age (SD): 22 (6) ● Sex (% female): 100 ● BMI (SD): 16.5 (1.3) ● AN (% of sample): 100 ● Duration of illness (months): 48 (36) ● Comorbidity (% of sample): n/a ● Psychotropic medication (% of sample): n/a <p>Included criteria: Subjects had to have recovered to within 80–85% of a body mass index of 18 kg·m²</p> <p>Excluded criteria: Significant abnormalities on EEG and blood tests.</p> <p>Pretreatment: None described.</p> |
| Interventions | <p>Intervention Characteristics</p> <p>Intervention</p> <ul style="list-style-type: none"> ● <i>Description:</i> The exercises were performed twice a week for one hour each fortnight weeks. Two training programs were designed (A and B) to reduce subject boredom. Both training programs targeted all the major muscle groups, and were performed on alternative weeks. Two and half-kilogram dumbbells were used as the resistance for the upper body exercises, and elastic therabands were used as the resistance for the lower body exercises. Some of the exercises (squats, abdominal crunches) used only body weight as resistance. Each exercise session was supervised by a trained person and included an initial five minute warm up period (walking on the spot) and a five minute stretching period. ● <i>Manual-based:</i> no ● <i>Duration (weeks):</i> 8 |

| | |
|-----------------------|---|
| | <ul style="list-style-type: none"> ● <i>Number of sessions</i>: 16 one-hour sessions. <p>Control</p> <ul style="list-style-type: none"> ● <i>Description</i>: Inpatient treatment as usual. ● <i>Manual-based</i>: no ● <i>Duration (weeks)</i>: 8 ● <i>Number of sessions</i>: n/a |
| Outcomes | <p><i>ED behavior (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>ED behavior (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>Body weight (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome ● Reporting: Fully reported ● Scale: BMI ● Direction: Higher is better ● Data value: Endpoint <p><i>Body weight (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>Psychological symptoms (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome ● Reporting: Fully reported ● Scale: EDI total ● Direction: Lower is better ● Data value: Endpoint <p><i>Psychological symptoms (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>Recovery rate (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: DichotomousOutcome <p><i>Dropout</i></p> <ul style="list-style-type: none"> ● Outcome type: DichotomousOutcome <p><i>Quality of life (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: ContinuousOutcome <p><i>Hospitalizations (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: DichotomousOutcome |
| Identification | <p>Sponsorship source: Not reported</p> <p>Country: South Africa</p> <p>Setting: Inpatient treatment</p> <p>Comments: none</p> <p>Authors name: Ingrid Chantler</p> <p>Institution: School of Physiology, University of Witwatersrand Medical School</p> <p>Email: chantleri@physiology.wits.ac.za</p> <p>Address: Private Bag 3 · 2050 WITS, Johannesburg</p> |
| Notes | |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|--|--------------------|--|
| Allocation concealment | Unclear risk | no comments |
| Blinding of participants and personnel | High risk | no comments |
| Blinding of outcome assessors | Unclear risk | no comments |
| Selective outcome reporting | Low risk | no comments |
| Sequence Generation | Unclear risk | Judgement Comment: Method not described. |
| Incomplete outcome data | Unclear risk | Judgement Comment: None seems to have dropped out of treatment. Not described how many declined participation. |
| Other sources of bias | Low risk | no comments |

deValle 2010

| | |
|----------------|---|
| Methods | <p>Study design: Randomized controlled trial</p> <p>Study grouping: Parallel group</p> <p>Open Label:</p> <p>Cluster RCT:</p> |
|----------------|---|

| | |
|-----------------------------|--|
| <p>Participants</p> | <p>Baseline Characteristics</p> <p>Intervention</p> <ul style="list-style-type: none"> ● <i>Age (SD):</i> 14.7 (0.6) ● <i>Sex (% female):</i> 91 ● <i>BMI (SD):</i> 18.7 (1.7) ● <i>AN (% of sample):</i> 100 ● <i>Duration of illness (months):</i> 1.5 (0.3) ● <i>Comorbidity (% of sample):</i> n/a ● <i>Psychotropic medication (% of sample):</i> n/a <p>Control</p> <ul style="list-style-type: none"> ● <i>Age (SD):</i> 14.2 (1.2) ● <i>Sex (% female):</i> 91 ● <i>BMI (SD):</i> 18.2 (1.5) ● <i>AN (% of sample):</i> 100 ● <i>Duration of illness (months):</i> 2.5 (1) ● <i>Comorbidity (% of sample):</i> n/a ● <i>Psychotropic medication (% of sample):</i> n/a <p>Included criteria: (i) diagnosis of restrictive AN [15] in the aforementioned hospital; (ii) age 16 years; (iii) undergoing intrahospital psychotherapy and dietary counseling (two visits/week) in this hospital; and (iv) body mass index (BMI) 14.0 kg/m²</p> <p>Excluded criteria: None described.</p> <p>Pretreatment: None described.</p> |
| <p>Interventions</p> | <p>Intervention Characteristics</p> <p>Intervention</p> <ul style="list-style-type: none"> ● <i>Description:</i> Participants in the intervention group were enrolled in two training sessions per week for 12 weeks. Each session lasted 60–70 minutes and started at 11:30 AM, after the intrahospital psychotherapy session. The program was individually supervised (one instructor for every three participants). Each session started and ended with a low-intensity warmup and cool-down period (10–15 minutes each), each consisting of stretching exercises involving all major muscle groups. The core portion of the session included 11 strength exercises engaging the major muscle groups. + TAU ● <i>Manual-based:</i> no ● <i>Duration (weeks):</i> 12 ● <i>Number of sessions:</i> 24 one-hour sessions. <p>Control</p> <ul style="list-style-type: none"> ● <i>Description:</i> TAU: intrahospital psychotherapy and dietary counseling (two visits/week). ● <i>Manual-based:</i> no ● <i>Duration (weeks):</i> 12 ● <i>Number of sessions:</i> n/a |
| <p>Outcomes</p> | <p><i>ED behavior (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>ED behavior (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Body weight (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome ● Reporting: Fully reported ● Scale: BMI ● Direction: Higher is better ● Data value: Endpoint <p><i>Body weight (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Psychological symptoms (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Psychological symptoms (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Recovery rate (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Dichotomous Outcome <p><i>Dropout</i></p> <ul style="list-style-type: none"> ● Outcome type: Dichotomous Outcome ● Reporting: Fully reported ● Direction: Lower is better ● Data value: Endpoint <p><i>Quality of life (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome ● Reporting: Fully reported ● Scale: SF-36, Mental Component Scale ● Range: 0-100 ● Direction: Higher is better ● Data value: Endpoint |

| | |
|-----------------------|--|
| | <p><i>Hospitalizations (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: DichotomousOutcome |
| Identification | <p>Sponsorship source: This work was supported by grants from Universidad Europeade Madrid (2007/UEM23 and OTRI2008/UEM14), Fondo de Investigaciones Sanitarias (PI061183), and from the Ministerio de Educación y Ciencia, Spain (EX-2007-1124), and Fundación Blas Méndez Ponce Ayuda al Niño Oncológico.</p> <p>Country: Spain</p> <p>Setting: Outpatient</p> <p>Comments: none</p> <p>Authors name: María Fernández del Valle</p> <p>Institution: Universidad Europea de Madrid, Spain</p> <p>Email: alejandro.lucia@uem.es</p> <p>Address: Universidad Europea de Madrid, 28670 Villaviciosa de Odón, Madrid, Spain</p> |
| Notes | <p><i>Nkr 46 Anoreksi</i> on 18/03/2016 01:27</p> <p>Outcomes</p> <p>Quality of life (longest FU) er ved EOT.</p> |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|--|--------------------|---|
| Allocation concealment | Low risk | Judgement Comment: The participant randomization assignment followed an allocation concealment process. |
| Blinding of participants and personnel | High risk | no comments |
| Blinding of outcome assessors | Unclear risk | Judgement Comment: Self-report measures and dropout can be influenced by no blinding to treatment arm. |
| Selective outcome reporting | Low risk | no comments |
| Sequence Generation | Low risk | Judgement Comment: They were randomly assigned with a block on gender and Tanner stage for females (II or III-V) to either a training or control group. |
| Incomplete outcome data | Unclear risk | no comments |
| Other sources of bias | Unclear risk | Judgement Comment: Unclear how participants were selected for the study. |

FernandezDelValle 2014

| | |
|----------------------|---|
| Methods | <p>Study design: Randomized controlled trial</p> <p>Study grouping: Parallel group</p> <p>Open Label:</p> <p>Cluster RCT:</p> |
| Participants | <p>Baseline Characteristics</p> <p>Intervention</p> <ul style="list-style-type: none"> ● <i>Age (SD):</i> 12.61 (0.59) ● <i>Sex (% female):</i> 100 ● <i>BMI (SD):</i> 17.28 (2.55) ● <i>AN (% of sample):</i> 100 ● <i>Duration of illness (months):</i> not reported ● <i>Comorbidity (% of sample):</i> not reported ● <i>Psychotropic medication (% of sample):</i> not reported <p>Control</p> <ul style="list-style-type: none"> ● <i>Age (SD):</i> 13.00 (0.60) ● <i>Sex (% female):</i> 100 ● <i>BMI (SD):</i> 18.12 (2.11) ● <i>AN (% of sample):</i> 100 ● <i>Duration of illness (months):</i> not reported ● <i>Comorbidity (% of sample):</i> not reported ● <i>Psychotropic medication (% of sample):</i> not reported <p>Included criteria: (1) meet the criteria for the restricting type of anorexia nervosa (F50.0) from the Diagnostic and Statistical Manual of Mental Disorders IV; (2) age below 17 years; (3) participate in a structured day care program (receive psychological therapy 3 days/week and daily life tracing [including diet between 1,800 and 2,500 kcal/day, depending on the patient]); (4) have BMI >14.0 kg/m; (5) not being excessive exercisers (<6 h per week of moderate to vigorous physical activity on admission to the program); and (6) have no contraindications to performing physical activity. Continuance criteria were added for those patients belonging to the intervention group: (1) absence of significant losses of weight and BMI attributable to voluntary reduction of dietary intake; (2) no development of excessive exercise behaviors.</p> <p>Excluded criteria: None described.</p> <p>Pretreatment: None.</p> |
| Interventions | <p>Intervention Characteristics</p> <p>Intervention</p> <ul style="list-style-type: none"> ● <i>Description:</i> TAU + The warm-up consisted of dynamic exercises involving all major muscle groups, 30 and the co-session included strength exercises engaging the major muscle groups (bench-press, leg-press, lateral row, leg extension, lateral pull-down, abdominal crunch, lowback extension, and push-ups) followed by stretching exercises. |

| | |
|-----------------------|---|
| | <p>Additionally, the intervention group increased calorie intake by means of a high-protein milkshake (150 kcal) because of the energy expenditure required during the strength training session.</p> <ul style="list-style-type: none"> ● <i>Manual-based</i>: no ● <i>Duration (weeks)</i>: 8 ● <i>Number of sessions</i>: 24 sessions, 50-60 minutes <p>Control</p> <ul style="list-style-type: none"> ● <i>Description</i>: The control group underwent psychological therapy, following the same schedule as the intervention group, maintaining the same treatment except for the exercise program intervention and additional protein intake (150 kcal) ● <i>Manual-based</i>: n/a ● <i>Duration (weeks)</i>: n/a ● <i>Number of sessions</i>: n/a |
| Outcomes | <p><i>ED behavior (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>ED behavior (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Body weight (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome ● Reporting: Fully reported ● Scale: BMI ● Direction: Higher is better ● Data value: Endpoint <p><i>Body weight (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome ● Reporting: Fully reported ● Scale: BMI ● Direction: Higher is better ● Data value: Endpoint <p><i>Psychological symptoms (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Psychological symptoms (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Recovery rate (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Dichotomous Outcome <p><i>Dropout (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: Dichotomous Outcome <p><i>Quality of life (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Hospitalizations (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Dichotomous Outcome |
| Identification | <p>Sponsorship source: This study has received the National Research Award in Sports Medicine (Spain, 2012) granted by Universidad de Oviedo (Spain) and sponsored by Cajastur.</p> <p>Country: Spain</p> <p>Setting: outpatient treatment</p> <p>Comments: none</p> <p>Authors name: Maria Fernandez-del- Valle</p> <p>Institution: Department of Health, Exercise Sport and Sciences, Texas Tech University, Lubbock, Texas</p> <p>Email: Maria.fernandez- del-valle@ttu.edu</p> <p>Address: Department of Health Exercise and Sports Sciences, Exercise and Sports Sciences Building, 3204 Main, Lubbock, TX 49423.</p> |
| Notes | <p><i>Nkr 46 Anoreksi</i> on 20/03/2016 03:49</p> <p>Outcomes</p> <p>Longest FU is 4 weeks post treatment.</p> |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|--|--------------------|---|
| Allocation concealment | Unclear risk | Judgement Comment: They were randomly assigned to an intervention group or a control group. |
| Blinding of participants and personnel | High risk | |
| Blinding of outcome assessors | Low risk | Judgement Comment: No blinding but only physiological measures included in the study. |
| Selective outcome reporting | Low risk | |
| Sequence Generation | Low risk | |
| Incomplete outcome data | Unclear risk | Judgement Comment: No intention-to-treat analyses. |
| Other sources of bias | Low risk | |

Thien 2000

| | |
|----------------------|--|
| Methods | <p>Study design: Randomized controlled trial Study grouping: Parallel group Open Label: Cluster RCT:</p> |
| Participants | <p>Baseline Characteristics</p> <p>Intervention</p> <ul style="list-style-type: none"> ● <i>Age (SD):</i> 29.0 (4.4) ● <i>Sex (% female):</i> 100 ● <i>BMI (SD):</i> 20.26 (1.8) ● <i>AN (% of sample):</i> 100 ● <i>Duration of illness (months):</i> n/a ● <i>Comorbidity (% of sample):</i> n/a ● <i>Psychotropic medication (% of sample):</i> n/a <p>Control</p> <ul style="list-style-type: none"> ● <i>Age (SD):</i> 36.1 (7.9) ● <i>Sex (% female):</i> 86 ● <i>BMI (SD):</i> 17.2 (1.6) ● <i>AN (% of sample):</i> 100 ● <i>Duration of illness (months):</i> n/a ● <i>Comorbidity (% of sample):</i> n/a ● <i>Psychotropic medication (% of sample):</i> n/a <p>Included criteria: All patients between the ages of 17 and 45 with a diagnosis of anorexia nervosa attending St. Paul's Hospital Eating Disorders Outpatient follow-up clinic for the month of July 1997 were invited to enroll in this study. Excluded criteria: None described. Pretreatment: the differences between the two groups in age, percent BF, and BMI were statistically significant, with the control group having a significantly older population with lower percent BF and BMI at baseline.</p> |
| Interventions | <p>Intervention Characteristics</p> <p>Intervention</p> <ul style="list-style-type: none"> ● <i>Description:</i> Follow-up treatment as usual + In the experimental arm, patients were seen by the occupational therapist who would review and adjust the level of exercise based on the protocol mentioned below. In the graded exercise protocol, the level of activity was dependent on the patient's percent ideal body weight (IBW) and percent BF and involved a graduated reintroduction of activity. ● <i>Manual-based:</i> no ● <i>Duration (weeks):</i> 12 ● <i>Number of sessions:</i> Exercise 3 times per week. TAU: one session every 2-3 weeks. <p>Control</p> <ul style="list-style-type: none"> ● <i>Description:</i> Patients were followed as usual, every 2-3 weeks for 3 months. At each visit, all patients had their body fat and weight measured and they were asked about medical complications and their activity level. In the control arm, patients were encouraged, as usual, to limit exercise as much as possible. ● <i>Manual-based:</i> no ● <i>Duration (weeks):</i> 12 ● <i>Number of sessions:</i> one session every 2-3 weeks. |
| Outcomes | <p><i>ED behavior (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>ED behavior (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Body weight (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome ● Reporting: Fully reported ● Scale: Change in BMI ● Direction: Higher is better ● Data value: Change from baseline <p><i>Body weight (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Psychological symptoms (end of treatment)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Psychological symptoms (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome <p><i>Recovery rate (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Dichotomous Outcome <p><i>Dropout</i></p> <ul style="list-style-type: none"> ● Outcome type: Dichotomous Outcome <p><i>Quality of life (longest FU)</i></p> <ul style="list-style-type: none"> ● Outcome type: Continuous Outcome ● Reporting: Fully reported ● Scale: Change in SF-36 total score ● Direction: Higher is better |

| | |
|-----------------------|--|
| | <ul style="list-style-type: none"> ● Data value: Change from baseline <i>Hospitalizations (longest FU)</i> <ul style="list-style-type: none"> ● Outcome type: DichotomousOutcome |
| Identification | <p>Sponsorship source: Not reported</p> <p>Country: Canada</p> <p>Setting: Outpatient treatment</p> <p>Comments: none</p> <p>Authors name: Vincent Thien</p> <p>Institution: University of British Columbia, British Columbia, Canada</p> <p>Email: n/a</p> <p>Address: Dr. C. Laird Birmingham, Eating Disorders Clinic, St. Paul's Hospital, 1081 Burrard Street, Vancouver, British Columbia V6Z 1Y6.</p> |
| Notes | <p><i>Nkr 46 Anoreksi</i> on 19/03/2016 03:58</p> <p>Outcomes Quality of life is reported from EOT.</p> <p><i>Nkr 46 Anoreksi</i> on 19/03/2016 04:06</p> <p>Included Exercise started when patients were almost weight recovered.</p> |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|--|--------------------|---|
| Allocation concealment | Unclear risk | Judgement Comment: Patients were then randomized to a balanced block design into either the experimental or control arm. |
| Blinding of participants and personnel | High risk | |
| Blinding of outcome assessors | Unclear risk | Judgement Comment: Questionnaire and dropout can be influenced by no blinding. |
| Selective outcome reporting | Low risk | |
| Sequence Generation | Low risk | |
| Incomplete outcome data | High risk | Judgement Comment: 25% of participants dropped out and not included in analysis. |
| Other sources of bias | High risk | Judgement Comment: Group differences in age, percent BF, and BMI were statistically significant, with the control group having a significantly older population with lower percent BF and BMI at baseline |

Footnotes

Characteristics of excluded studies

Calogero 2004

| | |
|----------------------|--------------------|
| Reason for exclusion | Wrong study design |
|----------------------|--------------------|

Harris 2008

| | |
|----------------------|--------------------|
| Reason for exclusion | Wrong study design |
|----------------------|--------------------|

Hart 2001

| | |
|----------------------|--------------------|
| Reason for exclusion | Wrong intervention |
|----------------------|--------------------|

Nudel 1984

| | |
|----------------------|--------------------|
| Reason for exclusion | Wrong study design |
|----------------------|--------------------|

Rigaud 1997

| | |
|----------------------|--------------------|
| Reason for exclusion | Wrong study design |
|----------------------|--------------------|

Tokumura 2003

| | |
|----------------------|--------------------|
| Reason for exclusion | Wrong study design |
|----------------------|--------------------|

Touyz 1993

| | |
|----------------------|--------------------|
| Reason for exclusion | Wrong study design |
|----------------------|--------------------|

Footnotes

Characteristics of studies awaiting classification

Footnotes

Characteristics of ongoing studies

Footnotes

Summary of findings tables**Additional tables****References to studies****Included studies*****Carei 2010***

Carei, T. R.; Fyfe-Johnson, A. L.; Breuner, C. C.; Brown, M. A.. Randomized controlled clinical trial of yoga in the treatment of eating disorders. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine* 2010;46(4):346-351. [DOI: 10.1016/j.jadohealth.2009.08.007 [doi]]

Catalan Matamoros 2011

Catalan-Matamoros, D.; Helvik-Skjaerven, L.; Labajos-Manzanares, M. T.; Martinez-de-Salazar-Arboleas, A.; Sanchez-Guerrero, E.. A pilot study on the effect of Basic Body Awareness Therapy in patients with eating disorders: a randomized controlled trial. *Clinical rehabilitation* 2011;25(7):617-626. [DOI: 10.1177/0269215510394223 [doi]]

Chantler 2006

Chantler, I.; Szabo, C. P.; Green, K.. Muscular strength changes in hospitalized anorexic patients after an eight week resistance training program. *International Journal of Sports Medicine* 2006;27(8):660-665. [DOI: 10.1055/s-2005-865812 [doi]]

delValle 2010

del Valle, M. F.; Perez, M.; Santana-Sosa, E.; Fiuza-Luces, C.; Bustamante-Ara, N.; Gallardo, C.; Villasenor, A.; Graell, M.; Morande, G.; Romo, G. R.; Lopez-Mojares, L. M.; Ruiz, J. R.; Lucia, A.. Does resistance training improve the functional capacity and well being of very young anorexic patients? A randomized controlled trial. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine* 2010;46(4):352-358. [DOI: 10.1016/j.jadohealth.2009.09.001 [doi]]

FernandezDelValle 2014

FernandezDelValle M.; LarumbeZabala E.; VillasenorMontarroso A.; Cardona Gonzalez C.; DiezVega I.; Lopez Mojares L.M.; Perez Ruiz, M.. Resistance training enhances muscular performance in patients with anorexia nervosa: A randomized controlled trial.. *International Journal of Eating Disorders* 2014;47(6):601-609. [DOI:]

Thien 2000

Thien, V.; Thomas, A.; Markin, D.; Birmingham, C. L.. Pilot study of a graded exercise program for the treatment of anorexia nervosa. *The International journal of eating disorders* 2000;28(1):101-106. [DOI: 10.1002/(SICI)1098-108X(200007)28:1<101::AID-EAT12>3.0.CO;2-V [pii]]

Excluded studies***Calogero 2004***

Calogero, R. M.; Pedrotty, K. N.. The practice and process of healthy exercise: an investigation of the treatment of exercise abuse in women with eating disorders. *Eating disorders* 2004;12(4):273-291. [DOI: XDAYV31T9NVV1D16 [pii]]

Harris 2008

Harris, A. M.; McAlpine, D. E.; Shirbhate, R.; Manohar, C. U.; Levine, J. A.. Measurement of daily activity in restrictive type anorexia nervosa. *The International journal of eating disorders* 2008;41(3):280-283. [DOI: 10.1002/eat.20486 [doi]]

Hart 2001

Hart, S.; Field, T.; Hernandez-Reif, M.; Nearing, G.; Shaw, S.; Schanberg, S.; Kuhn, C.. Anorexia nervosa symptoms are reduced by massage therapy. *Eating disorders* 2001;9(4):289-299. [DOI: RVQA1TPL959UA4NK [pii]]

Nudel 1984

Nudel, D. B.; Gootman, N.; Nussbaum, M. P.; Shenker, I. R.. Altered exercise performance and abnormal sympathetic responses to exercise in patients with anorexia nervosa. *The Journal of pediatrics* 1984;105(1):34-37. [DOI:]

Rigaud 1997

Rigaud, D.; Moukaddem, M.; Cohen, B.; Malon, D.; Reveillard, V.; Mignon, M.. Refeeding improves muscle performance without normalization of muscle mass and oxygen consumption in anorexia nervosa patients. *The American Journal of Clinical Nutrition* 1997;65(6):1845-1851. [DOI:]

Tokumura 2003

Tokumura, M.; Yoshida, S.; Tanaka, T.; Nanri, S.; Watanabe, H.. Prescribed exercise training improves exercise capacity of convalescent children and adolescents with anorexia nervosa. *European journal of pediatrics* 2003;162(6):430-431. [DOI: 10.1007/s00431-003-1203-1 [doi]]

Touyz 1993

Touyz, S. W.; Lennerts, W.; Arthur, B.; Beumont, P. J. V.. Anaerobic exercise as an adjunct to refeeding patients with anorexia nervosa: Does it compromise weight gain? *European Eating Disorders Review* 1993;1(3):177-182. [DOI:]

Studies awaiting classification

Ongoing studies

Other references

Additional references

Other published versions of this review

Classification pending references

Data and analyses

1 Intervention vs Control

| Outcome or Subgroup | Studies | Participants | Statistical Method | Effect Estimate |
|--|---------|--------------|---|---------------------|
| 1.1 ED behavior (end of treatment) | 0 | 0 | Mean Difference (IV, Fixed, 95% CI) | Not estimable |
| 1.2 ED behavior (longest FU) | 0 | 0 | Mean Difference (IV, Fixed, 95% CI) | Not estimable |
| 1.3 Body weight (end of treatment) | 5 | 137 | Std. Mean Difference (IV, Random, 95% CI) | 0.02 [-0.32, 0.35] |
| 1.3.1 adults | 2 | 26 | Std. Mean Difference (IV, Random, 95% CI) | 0.10 [-0.68, 0.88] |
| 1.3.2 adolescents | 3 | 111 | Std. Mean Difference (IV, Random, 95% CI) | -0.00 [-0.38, 0.37] |
| 1.4 Body weight (longest FU) | 0 | 0 | Mean Difference (IV, Random, 95% CI) | Not estimable |
| 1.5 Psychological symptoms (end of treatment) | 2 | 67 | Mean Difference (IV, Random, 95% CI) | -0.36 [-1.75, 1.03] |
| 1.5.1 adults (EDE global and EDI total) | 1 | 14 | Mean Difference (IV, Random, 95% CI) | -1.50 [-3.72, 0.72] |
| 1.5.2 adolescents | 1 | 53 | Mean Difference (IV, Random, 95% CI) | 0.08 [-0.76, 0.92] |
| 1.6 Psychological symptoms (longest FU) | 0 | 0 | Mean Difference (IV, Random, 95% CI) | Not estimable |
| 1.7 Quality of life (longest FU) | 2 | 34 | Std. Mean Difference (IV, Random, 95% CI) | -0.62 [-1.32, 0.08] |
| 1.7.1 adults (SF-36 total, change from baseline) | 1 | 12 | Std. Mean Difference (IV, Random, 95% CI) | -0.85 [-2.07, 0.37] |
| 1.7.2 adolescents (SF-36 mental health) | 1 | 22 | Std. Mean Difference (IV, Random, 95% CI) | -0.51 [-1.36, 0.34] |
| 1.8 Recovery rate (longest FU) | 0 | | Risk Ratio (IV, Fixed, 95% CI) | No totals |
| 1.9 Hospitalizations (longest FU) | 4 | | Risk Ratio (IV, Random, 95% CI) | Subtotals only |
| 1.9.1 adults | 2 | 44 | Risk Ratio (IV, Random, 95% CI) | Not estimable |
| 1.9.2 adolescents | 2 | 97 | Risk Ratio (IV, Random, 95% CI) | 0.64 [0.08, 4.98] |
| 1.10 Dropout | 6 | 177 | Risk Ratio (IV, Random, 95% CI) | 1.24 [0.40, 3.82] |
| 1.10.1 adults | 3 | 58 | Risk Ratio (IV, Random, 95% CI) | 0.55 [0.02, 19.61] |
| 1.10.2 adolescents | 3 | 119 | Risk Ratio (IV, Random, 95% CI) | 1.41 [0.50, 3.96] |

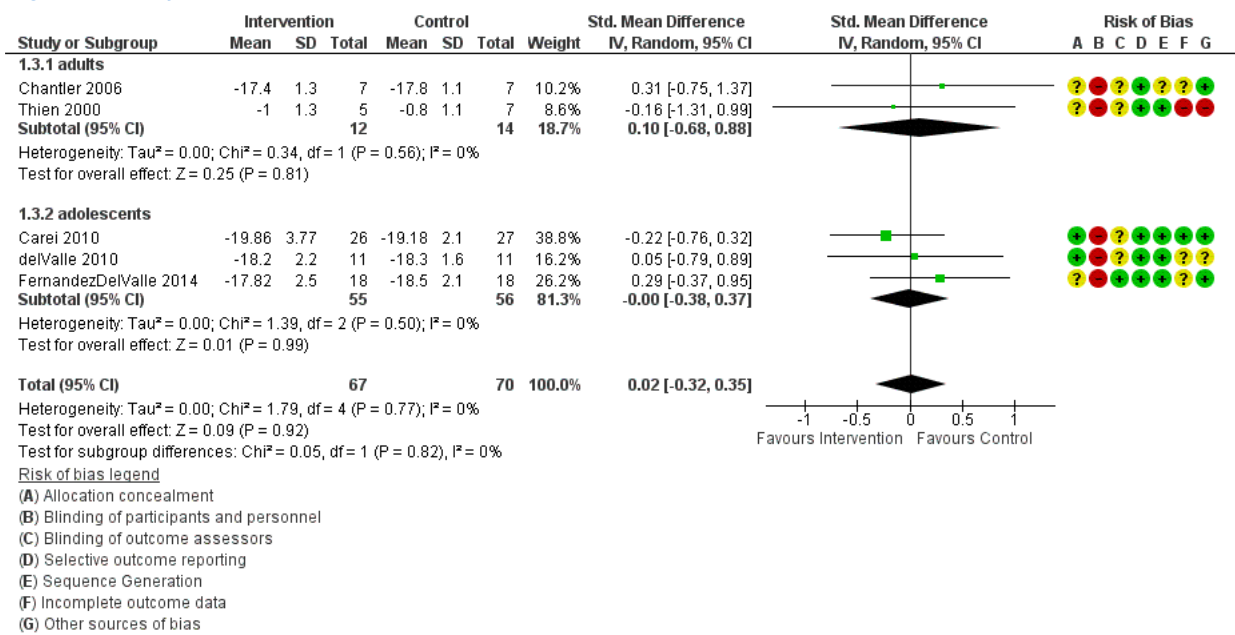
2 Intervention vs Control (ikke anvendt)

| Outcome or Subgroup | Studies | Participants | Statistical Method | Effect Estimate |
|--|---------|--------------|---|---------------------|
| 2.1 ED behavior (end of treatment) | 0 | 0 | Mean Difference (IV, Fixed, 95% CI) | Not estimable |
| 2.2 ED behavior (longest FU) | 0 | 0 | Mean Difference (IV, Fixed, 95% CI) | Not estimable |
| 2.3 Body weight (end of treatment) | 5 | 137 | Std. Mean Difference (IV, Random, 95% CI) | 0.02 [-0.32, 0.35] |
| 2.3.1 adults | 2 | 26 | Std. Mean Difference (IV, Random, 95% CI) | 0.10 [-0.68, 0.88] |
| 2.3.2 adolescents | 3 | 111 | Std. Mean Difference (IV, Random, 95% CI) | -0.00 [-0.38, 0.37] |
| 2.4 Body weight (longest FU) | 2 | 86 | Mean Difference (IV, Random, 95% CI) | 0.36 [-1.55, 2.26] |
| 2.4.1 adolescents | 2 | 86 | Mean Difference (IV, Random, 95% CI) | 0.36 [-1.55, 2.26] |
| 2.5 Psychological symptoms (end of treatment) | 2 | 67 | Mean Difference (IV, Random, 95% CI) | -0.36 [-1.75, 1.03] |
| 2.5.1 adults (EDE global and EDI total) | 1 | 14 | Mean Difference (IV, Random, 95% CI) | -1.50 [-3.72, 0.72] |
| 2.5.2 adolescents | 1 | 53 | Mean Difference (IV, Random, 95% CI) | 0.08 [-0.76, 0.92] |
| 2.6 Psychological symptoms (longest FU) | 1 | 50 | Mean Difference (IV, Random, 95% CI) | -0.56 [-1.37, 0.25] |
| 2.6.1 adolescents (EDE global) | 1 | 50 | Mean Difference (IV, Random, 95% CI) | -0.56 [-1.37, 0.25] |
| 2.7 Quality of life (longest FU) | 2 | 34 | Std. Mean Difference (IV, Random, 95% CI) | -0.24 [-0.95, 0.47] |
| 2.7.1 adults (SF-36 total, change from baseline) | 1 | 12 | Std. Mean Difference (IV, Random, 95% CI) | 0.25 [-0.91, 1.40] |
| 2.7.2 adolescents (SF-36 mental health) | 1 | 22 | Std. Mean Difference (IV, Random, 95% CI) | -0.51 [-1.36, 0.34] |

| | | | | |
|-----------------------------------|---|-----|---------------------------------|--------------------|
| 2.8 Recovery rate (longest FU) | 0 | | Risk Ratio (IV, Fixed, 95% CI) | No totals |
| 2.9 Hospitalizations (longest FU) | 4 | | Risk Ratio (IV, Random, 95% CI) | Subtotals only |
| 2.9.1 adults | 2 | 44 | Risk Ratio (IV, Random, 95% CI) | Not estimable |
| 2.9.2 adolescents | 2 | 97 | Risk Ratio (IV, Random, 95% CI) | 0.64 [0.08, 4.98] |
| 2.10 Dropout | 6 | 177 | Risk Ratio (IV, Random, 95% CI) | 1.24 [0.40, 3.82] |
| 2.10.1 adults | 3 | 58 | Risk Ratio (IV, Random, 95% CI) | 0.55 [0.02, 19.61] |
| 2.10.2 adolescents | 3 | 119 | Risk Ratio (IV, Random, 95% CI) | 1.41 [0.50, 3.96] |

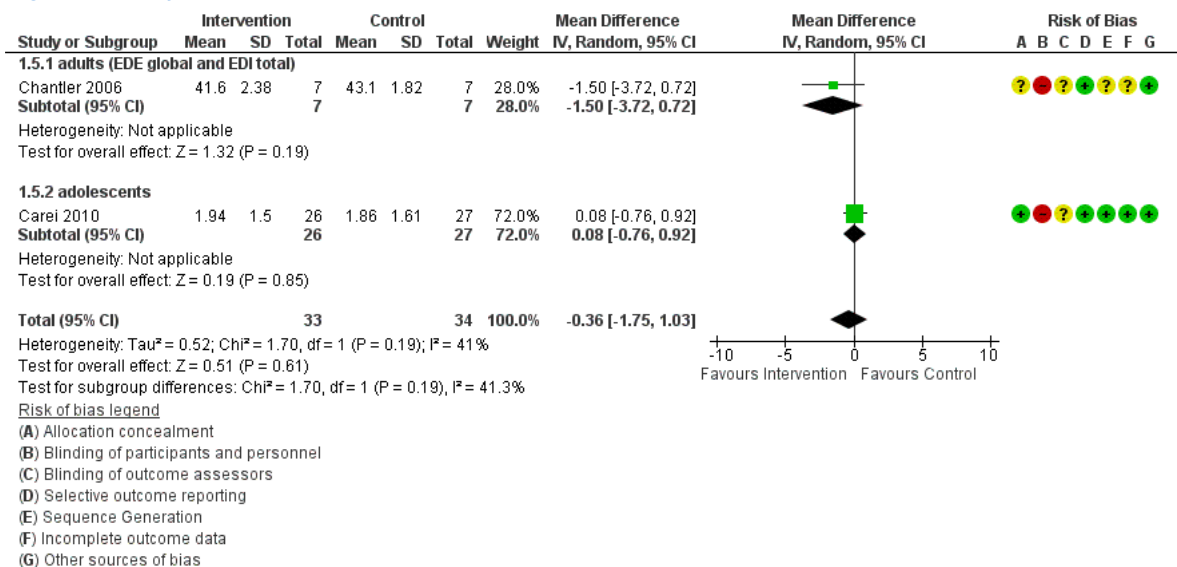
Figures

Figure 1 (Analysis 1.3)



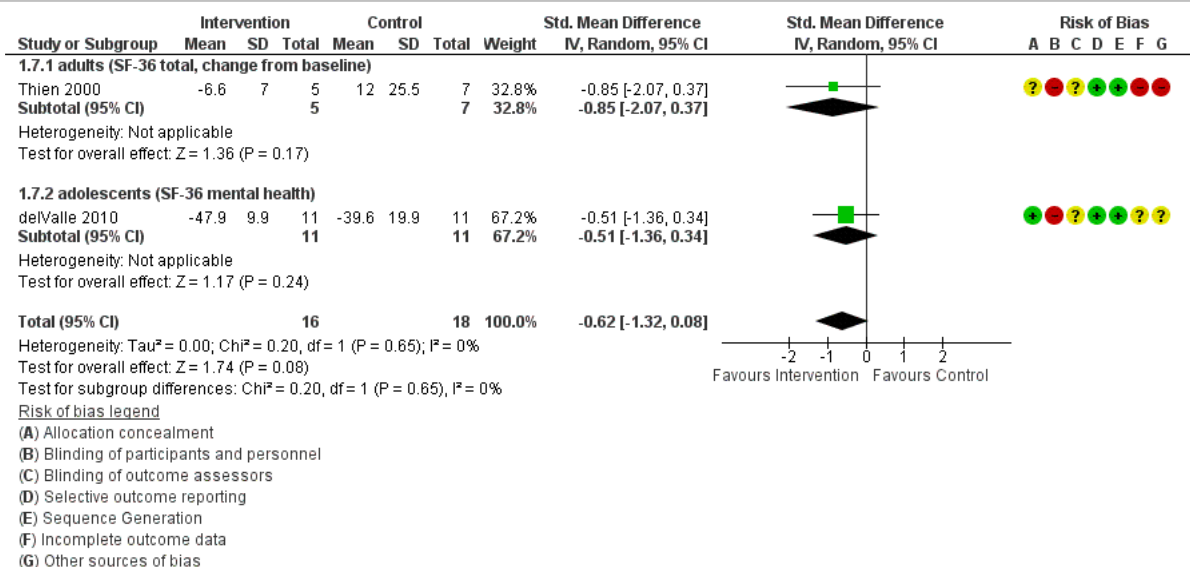
Forest plot of comparison: 1 Intervention vs Control, outcome: 1.3 Body weight (end of treatment).

Figure 2 (Analysis 1.5)



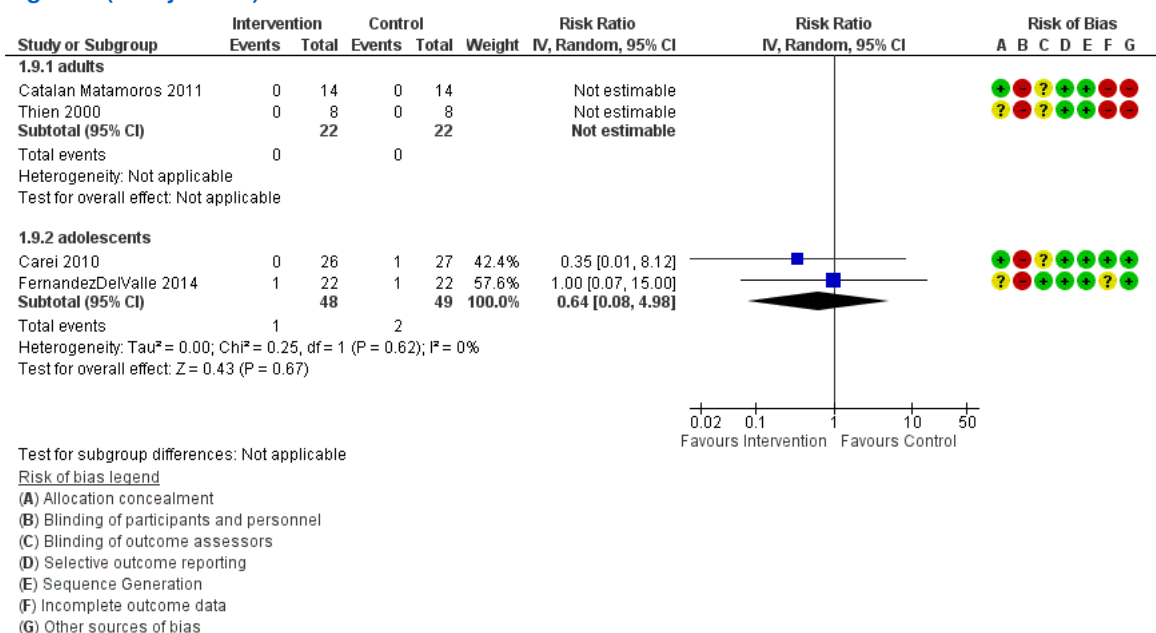
Forest plot of comparison: 1 Intervention vs Control, outcome: 1.5 Psychological symptoms (end of treatment).

Figure 3 (Analysis 1.7)



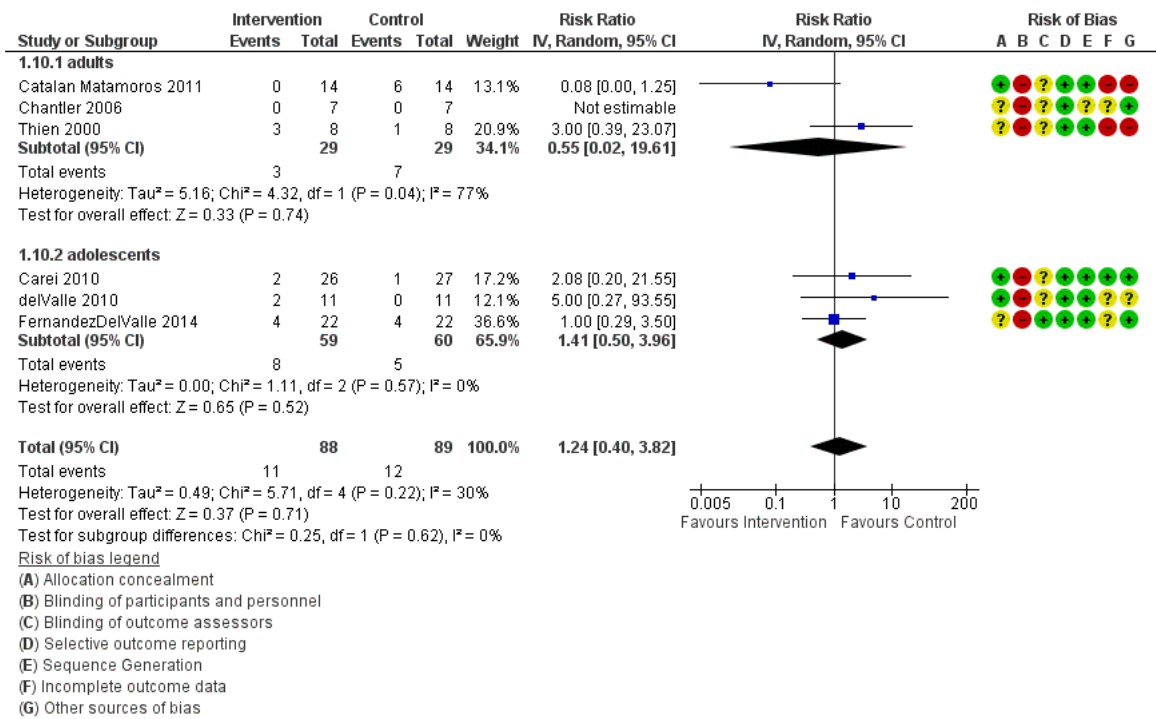
Forest plot of comparison: 1 Intervention vs Control, outcome: 1.7 Quality of life (longest FU).

Figure 4 (Analysis 1.9)



Forest plot of comparison: 1 Intervention vs Control, outcome: 1.9 Hospitalizations (longest FU).

Figure 5 (Analysis 1.10)



Forest plot of comparison: 1 Intervention vs Control, outcome: 1.10 Dropout.