NKR 47: PICO 7, Kombineret ernæring og træning frem for træning alene til geriatriske patienter uden underernæring eller risiko herfor

Review information

Authors

Sundhedsstyrelsen[1]

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Citation example: S. NKR 47: PICO 7, Kombineret ernæring og træning frem for træning alene til geriatriske patienter uden underernæring eller risiko herfor. Cochrane Database of Systematic Reviews [Year], Issue [Issue].

Characteristics of studies

Characteristics of included studies

Ng 2015

Methods	**Study design:** Randomized controlled trial **Study grouping:** Parallel group **Open Label:** **Cluster RCT:**
Participants	**Baseline Characteristics** Intervention ● *Age (mean, SD)*: 70.4, 4.74 ● *Sex (% Male)*: 46.9 ● *Comorbidity (Yes/No)*: yes ● *Undernourished or at risk (Yes/No)*: 2% with unintentional weightloss ● *Impairment (Body functions & structure descriptions)*: NR ● *Limitations (Activity descriptions)*: 2% dependent in IADL-ADL ● *Restrictions (Participation descriptions)*: Not reported ● *Housing (eg. residential home, own house)*: NR ● *Civil status (% living alone)*: NR ● *In risk of falling (Yes/No)*: NR ● *Frail (Yes/No)*: yes Control

	● *Age (mean, SD)*: 70.3, 5.25 ● *Sex (% Male)*: 43.8 ● *Comorbidity (Yes/No)*: yes ● *Undernourished or at risk (Yes/No)*: 6.3 % with unintentional weightloss ● *Impairment (Body functions & structure descriptions)*: NR ● *Limitations (Activity descriptions)*: 0% dependent in IADL-ADL ● *Restrictions (Participation descriptions)*: Not reported ● *Housing (eg. residential home, own house)*: NR ● *Civil status (% living alone)*: NR ● *In risk of falling (Yes/No)*: NR ● *Frail (Yes/No)*: 39,6% **Included criteria:** Prefrail and frail older adults were identified based on 5 Cardiovascular Health Study criteria defining physical frailty : unintentional weight loss, slowness, weakness, exhaustion, and low activity, which were scored 1 if present and 0 if absent. The total summed scores ranging from 0 to 5 were used to classify a participant as robust (score=0), prefrail (score=1 to 2), or frail (score = 3 to 5).Prefrail or frail older adults were eligible for the trial if they were aged 65 years and above, able to ambulate without personal assistance, and living at home. **Excluded criteria:** Participants were excluded if they had significant cognitive impairment (Mini Mental State Examination score); major depression; severe audiovisual impairment; any progressive,degenerative neurologic disease; terminal illness with life expectancy <12 months; were participating in other interventional studies; or were unavailable to participate for the full duration of the study. **Pretreatment:** The proportions of frailty vs prefrailty and low physical activity was relatively lower in the control group.
Interventions	**Intervention Characteristics** Intervention ● *Description*: Recieved physical exercise and nutrition intervention. Physical exercise was of moderate,gradually increasing intensity, tailored to participants'in-dividual abilities, of 90 minutes duration, on 2 days perweek for 12 weeks in classes conducted by a qualifiedtrainer, followed by 12 weeks of home-based exercises. Participants performed the exercises in groups of 8 to 10,and were encouraged to continue daily individualized ex-ercise assignments at home. The exercise program wasdesigned to improve strength and balance for older adults,according to American College of Sports Medicine guide-lines27for older adults, based on a single set of 8 to 15repetition maximum (RM), or 60% to 80% of 10 RM,starting with<50% 1 RM involving 8-10 major musclegroups. They included resistance exercises integrated withfunctional tasks; and balance training exercises involvingfunctional strength, sensory input, and added attentionaldemands were carried out at 3 levels of increasing demand. Nutrition intervention was: Nutritional Intervention.Each participant was provided acommercial formula (Fortisip Multi Fibre, Nutricia, Dublin,Ireland), iron and folate supplement (Sangobion, Merck,Kenilworth, NJ), vitamin B6 and vitamin B12 supplement(Neuroforte, R.B. Pharmaceuticals, Chennai, India), andcalcium and Vitamin D supplement (Caltrate, Pfizer,Singapore) taken daily for 24 weeks, which was designed toaugment caloric intake by about 20% and provide about onethird of the recommended daily allowances of vitamins andminerals. Given the variability in individual energy re-quirements, participants were encouraged to attain themaximal tolerable energy intake to gain 0.5 kg per week. They also recieved cognitive training. ● *Duration (Weeks)*: 12 uger på hold, fulgt af 12 ugers hjemmetræning

	● *Dose (eg. sessions, ml, energy/protein target, %1RM)*: Protein and energy supplementen (308 kcal and 12g protein) and were ecouraged to attain the maximal tolerable energy intake to gain 0.5 kg per week. Training sessions were of 90 minutes duration, 2 days per week for 12 weeks in classes, followed by 12 weeks of home-based exercises. intensity was 8-15 RM or 60-80% of 10 RM ● *Personel (eg. dietician, nurse, physiotherapist)*: Training: Qualified trainer. Control ● *Description*: Physical exercise was of moderate,gradually increasing intensity, tailored to participants'in-dividual abilities, of 90 minutes duration, on 2 days perweek for 12 weeks in classes conducted by a qualifiedtrainer, followed by 12 weeks of home-based exercises. Participants performed the exercises in groups of 8 to 10,and were encouraged to continue daily individualized ex-ercise assignments at home. The exercise program wasdesigned to improve strength and balance for older adults,according to American College of Sports Medicine guide-lines27for older adults, based on a single set of 8 to 15repetition maximum (RM), or 60% to 80% of 10 RM,starting with<50% 1 RM involving 8-10 major musclegroups. They included resistance exercises integrated withfunctional tasks; and balance training exercises involvingfunctional strength, sensory input, and added attentionaldemands were carried out at 3 levels of increasing demand. ● *Duration (Weeks)*: 12 uger på hold , fulgt af 12 ugers hjemmetræning ● *Dose (eg. sessions, ml, energy/protein target, %1RM)*: Training sessions were of 90 minutes duration, 2 days per week for 12 weeks in classes, followed by 12 weeks of home-based exercises. intensity was 8-15 RM or 60-80% of 10 RM ● *Personel (eg. dietician, nurse, physiotherapist)*: Training: Qualified trainer
Outcomes	*Kropsvægt (Body weight) EOT* ● **Outcome type**: ContinuousOutcome ● **Reporting**: Not reported *Kropsvægt (Body weight) LFU* ● **Outcome type**: ContinuousOutcome ● **Reporting**: Not reported *Muskelstyrke (Muscle strength) EOT* ● **Outcome type**: ContinuousOutcome ● **Reporting**: Fully reported ● **Scale**: Knee strength ● **Unit of measure**: kg ● **Direction**: Higher is better ● **Data value**: Endpoint *Muskelstyrke (Muscle strength) LFU* ● **Outcome type**: ContinuousOutcome ● **Reporting**: Not reported ● **Scale**: Knee strength ● **Unit of measure**: kg

- **Direction**: Higher is better

Mobilitet (Mobility) EOT
- **Outcome type**: ContinuousOutcome
- **Reporting**: Fully reported
- **Scale**: Fast gait speed test
- **Unit of measure**: seconds
- **Direction**: Lower is better
- **Data value**: Endpoint

Hverdagsaktiviteter (Activities of daily living) EOT
- **Outcome type**: DichotomousOutcome
- **Reporting**: Fully reported
- **Scale**: IADL and ADL dependency
- **Unit of measure**: Point prevalence frequencies
- **Direction**: Lower is better
- **Data value**: Endpoint

Hverdagsaktiviteter (Activities of daily living) LFU
- **Outcome type**: DichotomousOutcome
- **Reporting**: Not reported
- **Scale**: IADL and ADL dependency
- **Unit of measure**: Point-prevalence frequency
- **Direction**: Lower is better
- **Data value**: Endpoint

Livskvalitet (Quality of life) EOT
- **Outcome type**: ContinuousOutcome
- **Reporting**: Not reported

Livskvalitet, fysisk (Quality of life, physical) EOT
- **Outcome type**: ContinuousOutcome
- **Reporting**: Not reported

Livskvalitet, mental (Quality of life, mental) EOT
- **Outcome type**: ContinuousOutcome
- **Reporting**: Not reported

Kvalme (Nausea)
- **Outcome type**: DichotomousOutcome
- **Reporting**: Not reported

	Diarre (Diarrhea) ● **Outcome type**: DichotomousOutcome *Opkast (Vomit)* ● **Outcome type**: DichotomousOutcome ● **Reporting**: Not reported *Flatulens (Flatulence)* ● **Outcome type**: DichotomousOutcome ● **Reporting**: Not reported *Fald (Falls) EOT* ● **Outcome type**: DichotomousOutcome
Identification	**Sponsorship source:** The study was supported by a research grant NMRC/1108/2007 from the National Medical Research Council **Country:** Singapore **Setting:** Southwest region of Singapore **Comments:** **Authors name:** Tze Pin Ng **Institution:** Gerontology Research Programme, Department of Psychological Medicine, National University of Singapore, Singapore **Email:** pcmngtp@nus.edu.sg **Address:** NUHS Tower Block, 9thFloor, 1EKent Ridge Road, Singapore 119228, Singapore
Notes	*Lillian MøRch JøRgensen* on 19/03/2016 22:40 **Select** er helt enig *Nkr 47 Geria* on 08/04/2016 23:05 **Select** Inkludere. Populationen er dog lige på grænsen. Størstedelen er pre-frail. Det skal vi diskutere om vi kan leve med. Herudover er de grupper vi kan bruge: Exercise gruppen og Combination. Dvs. bliver vi enige om at populationen er ok, skal vi tage stilling til om vi synes det er ok at sammenmign med en ernærings og træningsintervention, hvor de også har fået kognitiv træning. Umiddelbart kan jeg ikke se at det skulle påvirke vores outcomes. Fortisip multi fibre indeholder ca. 300 kcal og 12 g protein pr flaske. Så den intervention er inden for PICO-kriterierne. *Lillian MøRch JøRgensen* on 14/04/2016 06:41 **Select** ernæringsinterventionen er at øge kalorieindtagelsen med 20% - ikke noget oplyst om proteinmængden. Da frailty-kriterier indeholder vægttab, er det en noget inhomogen population....

	Lillian MøRch JøRgensen on 19/04/2016 19:02 **Interventions** træning og ernæringstilskud *Lillian MøRch JøRgensen* on 20/04/2016 00:14 **Outcomes** Der er ikke oplysninger om kropsvægt, men BMI, hvorfor den værdi er indtastet.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Judgement Comment: Randomiseringssekvens i skiftende blokke af 10. Projektleder, som tildelte behandling, var ikke involveret i studiet i øvrigt
Allocation concealment (selection bias)	Low risk	Judgement Comment: Central computeriseret randomisering
Blinding of participants and personnel (performance bias)	Unclear risk	Judgement Comment: Only reported that the nurse who gave the Nutritional supplements were blinded. No other statements of blinding of personel and participants
Blinding of outcome assessment (detection bias)	Low risk	Judgement Comment: vurdering af funktionsniveau blev foretaget af personale, som ikke kendte forsøgspersonens allokeringsgruppe.
Incomplete outcome data (attrition bias)	Low risk	Judgement Comment: Lille frafald, alle indgår i ITT -analyse
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	None detected

Tieland 2012

Methods	**Study design:** Randomized controlled trial **Study grouping:** Parallel group **Open Label:** **Cluster RCT:**
Participants	**Baseline Characteristics** Intervention ● *Age (mean, SD)*: 78, 9 ● *Sex (% Male)*: 35 ● *Comorbidity (Yes/No)*: Not Reported

	● *Undernourished or at risk (Yes/No)*: Not Reported ● *Impairment (Body functions & structure descriptions)*: SPPB Points mean 8 (CI:7.2-8.9) ● *Limitations (Activity descriptions)*: Not Reported ● *Restrictions (Participation descriptions)*: Not Reported ● *Housing (eg. residential home, own house)*: Not Reported ● *Civil status (% living alone)*: Not Reported ● *In risk of falling (Yes/No)*: Not Reported ● *Frail (Yes/No)*: Frail and pre-frail Control ● *Age (mean, SD)*: 79, 6 ● *Sex (% Male)*: 32 ● *Comorbidity (Yes/No)*: Not Reported ● *Undernourished or at risk (Yes/No)*: Not Reported ● *Impairment (Body functions & structure descriptions)*: SPPB Points mean 7.9 (CI:7-8.8) ● *Limitations (Activity descriptions)*: Not Reported ● *Restrictions (Participation descriptions)*: Not Reported ● *Housing (eg. residential home, own house)*: Not Reported ● *Civil status (% living alone)*: Not Reported ● *In risk of falling (Yes/No)*: Not Reported ● *Frail (Yes/No)*: Frail and pre-frail **Included criteria:** Elderly subjects (65 years old) were recruited from an existing database, through distribution of flyers, and by local information meetings between December 2009 and September 2010. Potentially eligible elderly people were screened for prefrailty and frailty using the Fried criteria. These criteria are (1) unintentional weight loss, (2)weakness, (3) self-reported exhaustion, (4) slow walking speed, and(5) low physical activity. Prefrailty was classified when 1 or 2 criteria were present and frailty was defined when 3 or more criteria were present. **Excluded criteria:** Subjects who were diagnosed with cancer, chronic obstructive pulmonary disease, or muscle disease or who were unable to perform the exercise regimen were excluded. Subjects with type 2 diabetes (7 mmol/L) and renal insufficiency (eGFR<60 mL/min/1.73 m2) were excluded. **Pretreatment:** No baseline differences between groups (P > .05).
Interventions	**Intervention Characteristics** Intervention ● *Description*: Training in combination with daily protein and energy supplementation. The resistance-type exercise training was performed 2 times per week under personal supervision for a 24-week period. The sessions were performed in the morning and afternoon with at least 72 hours between sessions. The training consisted of a 5-minute warm-up on a cycle ergometer, followed by 4 sets on the leg-press and leg-extension machines and 3 sets on chest press, lat pulldown, pec-dec, and vertical row machines. The workload started at 50% of 1-RM (10-15 repetitions per set) and was increased to 75% of 1-RM (8-10 repetitions). Resting periods of 1 minute were allowed between sets and 2 minutes between exercises. Workload intensity was adjusted based on the1-RM outcomes.

	The Nutrition intervention: Twice daily, the subjects received either a 250-mL protein-supplemented beverage containing 15 g protein (MPC80; milk protein concentrate), 7.1 g lactose, 0.5 g fat, and 0.4 g calcium (Equvalent to approximately 180 kcal), or a matching placebo supplement containing no protein, 7.1 g lactose, and 0.4 g calcium (Friesland Campina Consumer Products Europe, Wageningen, the Netherlands). All beverages were vanilla flavored to mask the contents of the drinks and packages were nontransparent. The subjects consumed 1 beverage directly after breakfast and 1 beverage directly after lunch. ● *Duration (Weeks)*: 24 ● *Dose (eg. sessions, ml, energy/protein target, %1RM)*: Nutrition: Daily supplementation with 30 g protein and app. 180 kcal Training: 2 sessions /week . Workload started at 50% of 1-RM (10-15 repetitions per set) and was increased to 75% of 1-RM (8-10 repetitions). ● *Personel (eg. dietician, nurse, physiotherapist)*: Not Reported Control ● *Description*: The resistance-type exercise training was performed 2 times per week under personal supervision for a 24-week period. The sessions were performed in the morning and afternoon with at least 72 hours between sessions. The training consisted of a 5-minute warm-up on a cycle ergometer, followed by 4 sets on the leg-press and leg-extension machines and 3 sets on chest press, lat pulldown, pec-dec, and vertical row machines. The workload started at 50% of 1-RM (10-15 repetitions per set) and was increased to 75% of 1-RM (8-10 repetitions). Resting periods of 1 minute were allowed between sets and 2 minutes between exercises. Workload intensity was adjusted based on the1-RM outcomes. ● *Duration (Weeks)*: 24 ● *Dose (eg. sessions, ml, energy/protein target, %1RM)*: 2 sessions /week . Workload started at 50% of 1-RM (10-15 repetitions per set) and was increased to 75% of 1-RM (8-10 repetitions). ● *Personel (eg. dietician, nurse, physiotherapist)*: Not Reported
Outcomes	*Kropsvægt (Body weight) EOT* ● **Outcome type**: ContinuousOutcome ● **Reporting**: Fully reported ● **Scale**: Vægt ● **Unit of measure**: kg ● **Direction**: Higher is better ● **Data value**: Endpoint *Kropsvægt (Body weight) LFU* ● **Outcome type**: ContinuousOutcome ● **Reporting**: Not reported *Muskelstyrke (Muscle strength) EOT* ● **Outcome type**: ContinuousOutcome ● **Reporting**: Fully reported ● **Scale**: Leg Press Strength ● **Unit of measure**: kg ● **Direction**: Higher is better

- **Data value**: Endpoint

Muskelstyrke (Muscle strength) LFU
- **Outcome type**: ContinuousOutcome
- **Reporting**: Not reported

Mobilitet (Mobility) EOT
- **Outcome type**: ContinuousOutcome
- **Reporting**: Fully reported
- **Scale**: Gait speed
- **Unit of measure**: Seconds
- **Direction**: Lower is better
- **Data value**: Endpoint

Hverdagsaktiviteter (Activities of daily living) EOT
- **Outcome type**: DichotomousOutcome
- **Reporting**: Not reported

Hverdagsaktiviteter (Activities of daily living) LFU
- **Outcome type**: DichotomousOutcome
- **Reporting**: Not reported

Livskvalitet (Quality of life) EOT
- **Outcome type**: ContinuousOutcome
- **Reporting**: Not reported
- **Notes**: Did not change over time- results are not displaied

Livskvalitet, fysisk (Quality of life, physical) EOT
- **Outcome type**: ContinuousOutcome
- **Reporting**: Not reported
- **Notes**: Measured but not reported

Livskvalitet, mental (Quality of life, mental) EOT
- **Outcome type**: ContinuousOutcome
- **Reporting**: Not reported
- **Notes**: Measured but not reported

Kvalme (Nausea)
- **Outcome type**: DichotomousOutcome
- **Reporting**: Not reported

Diarre (Diarrhea)
- **Outcome type**: DichotomousOutcome

	● **Reporting**: Not reported *Opkast (Vomit)* ● **Outcome type**: DichotomousOutcome ● **Reporting**: Not reported *Flatulens (Flatulence)* ● **Outcome type**: DichotomousOutcome ● **Reporting**: Not reported *Fald (Falls) EOT* ● **Outcome type**: DichotomousOutcome ● **Reporting**: Not reported
Identification	**Sponsorship source:** Not reported **Country:** The Netherlands **Setting:** Community **Comments:** No information on Sponsorship Source **Authors name:** Michael Tieland **Institution:** Top Institute Food and Nutrition & Division of Human Nutrition, Wageningen University, Wageningen, The Netherlands **Email:** Michael.Tieland@wur.nl **Address:** Division of Human Nutrition,Wageningen University, PO Box 8129, 6700 EV Wageningen, The Netherlands
Notes	*Lillian MøRch JøRgensen* on 17/03/2016 06:43 **Select** patienterne opfylder kriterier for (pre)frailty, men det er ikke oplyst, om de faktisk har haft et vægttab (er et af Frieds kriterier) *Nkr 47 Geria* on 12/04/2016 18:57 **Select** Giver kun proteinsupplement. Ikke energi.

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	SUPPORTING ANNOTATIONS No annotations COMMENTS "computer-generated random numbers in stratified permuted blocks of size 4,"

Allocation concealment (selection bias)	Low risk	SUPPORTING ANNOTATIONS No annotations COMMENTS "An independent person randomized subjects by means of computer-generated random numbers in stratified permuted blocks of size 4, stratified by gender"
Blinding of participants and personnel (performance bias)	Low risk	SUPPORTING ANNOTATIONS No annotations COMMENTS "Staff members and subjects were blinded toward treatment allocation until completion of data analysis." Placebo nutritional supplement was used.
Blinding of outcome assessment (detection bias)	Unclear risk	SUPPORTING ANNOTATIONS No annotations COMMENTS "Staff members and subjects were blinded toward treatment allocation until completion of data analysis." However, they do not state clearly if the outcome assessor is blinded.
Incomplete outcome data (attrition bias)	Low risk	SUPPORTING ANNOTATIONS No annotations COMMENTS In total, 11 subjects withdrew from the study: 5 from the protein and 6 from the placebo group. Ten subjects gave various nonestudy-related medical complications as reasons for their withdrawal and 1 subject gave heavy burden of the study as reason for withdrawal. For the intention-to-treat analyses, 4 dropouts were willing to have final assessments
Selective reporting (reporting bias)	Low risk	SUPPORTING ANNOTATIONS No annotations COMMENTS Trial Registration: clinicaltrials.gov identifier: NCT01110369.
Other bias	Low risk	None detected

Footnotes

References to studies

Included studies

Ng 2015

Ng,Tze Pin; Feng,Liang; Nyunt,Ma Shwe Zin; Feng,Lei; Niti,Mathew; Tan,Boon Yeow; Chan,Gribson; Khoo,Sue Anne; Chan,Sue Mei; Yap,Philip; Yap,Keng Bee. Nutritional, Physical, Cognitive, and Combination Interventions and Frailty Reversal Among Older Adults: A Randomized Controlled Trial. The American Journal of Medicine 2015;128(11):1225-1236.e1. [DOI:]

Tieland 2012

Tieland,Michael; Dirks,Marlou L.; van,der Zwaluw; Verdijk,Lex B.; van,de Rest; de Groot,Lisette,C.P.G.M.; van Loon,Luc,J.C.. Protein supplementation increases muscle mass gain during prolonged resistance-type exercise training in frail elderly people: a randomized, double-blind, placebo-controlled trial. Journal of the American Medical Directors Association 2012;13(8):713-9. [DOI:]

Excluded studies

Abizanda 2015

Abizanda P.; Lopez M.D.; Garcia V.P.; Estrella J.D.D.; da Silva,Gonzalez A.; Vilardell N.B.; Torres K.A.. Effects of an oral nutritional supplementation plus physical exercise intervention on the physical function, nutritional status, and quality of life in frail institutionalized older adults: The ACTIVNES study. Journal of the American Medical Directors Association 2015;16(5):439. [DOI:]

Alves 2013

Alves,Christiano Robles Rodrigues; Merege Filho,Carlos,Alberto Abujabra; Benatti,Fabiana Braga; Brucki,Sonia; Pereira,Rosa Maria R.; Pinto,de Sa; Lima,Fernanda Rodrigues; Roschel,Hamilton; Gualano,Bruno. Creatine supplementation associated or not with strength training upon emotional and cognitive measures in older women: a randomized double-blind study. PloS one 2013;8(10):e76301. [DOI:]

Baer 2013

Baer,Janine T.. Improving protein and vitamin D status of obese patients participating in physical rehabilitation. Rehabilitation nursing : the official journal of the Association of Rehabilitation Nurses 2013;38(3):115-9. [DOI:]

Bell 2014

Bell,Jack J.; Rossi,Tony; Bauer,Judith D.; Capra,Sandra. Developing and evaluating interventions that are applicable and relevant to inpatients and those who care for them; a multiphase, pragmatic action research approach. BMC medical research methodology 2014;14(Journal Article):98. [DOI:]

Bonnefoy 2012

Bonnefoy M.; Boutitie F.; Mercier C.; Gueyffier F.; Carre C.; Guetemme G.; Ravis B.; Laville M.; Cornu C.. Efficacy of a home-based intervention programme on the physical activity level and functional ability of older people using domestic services: A randomised study. Journal of Nutrition, Health and Aging 2012;16(4):370-377. [DOI:]

Bridenbaugh 2015

Bridenbaugh S.A.; Kressig R.W.. Protein drink combined with Jaques-Dalcroze Eurhythmics improves gait speed and physical function in seniors. European Geriatric Medicine 2015;6(Web Page):S8. [DOI:]

Chan 2012

Chan,Ding-Cheng Derrick; Tsou,Hsiao-Hui; Yang,Rong-Sen; Tsauo,Jau-Yih; Chen,Ching-Yu; Hsiung,Chao Agnes; Kuo,Ken N.. A pilot randomized controlled trial to improve geriatric frailty. BMC geriatrics 2012;12(Journal Article):58. [DOI:]

Dapp 2014

Dapp U.; Anders J.A.M.; Suijker J.J.M.; Bjorkman M.P.. Various aspects of interventions on physical functioning in community dwelling older persons. European Geriatric Medicine 2014;5(Web Page):S26-S27. [DOI:]

Dhonukshe Rutten 2014

Dhonukshe-Rutten R.A.M.; Rest,Van De; Tieland M.. Nutrition later in life: For bone, brain and muscle function. European Geriatric Medicine 2014;5(Web Page):S41. [DOI:]

Fairhall 2008

Fairhall,Nicola; Aggar,Christina; Kurrle,Susan E.; Sherrington,Catherine; Lord,Stephen; Lockwood,Keri; Monaghan,Noeline; Cameron,Ian D.. Frailty Intervention Trial (FIT). BMC geriatrics 2008;8(Journal Article):27. [DOI:]

Fielding 2015

Fielding R.; Kirn D.; Koochek A.; Reid K.; Von,Berens A.; Travison T.; Zhu H.; Folta S.; Sacheck J.; Nelson M.; Liu C.; Phillips E.; Aberg A.C.; Nydahl M.; Gustafsson T.; Cederholm T.. Effect of nutritional supplementation and structured physical activity on walk capacity in mobility-limited older adults: Results from the VIVE2 study. European Geriatric Medicine 2015;6(Web Page):S178-S179. [DOI:]

Gualano 2014

Gualano,Bruno; Macedo,Andre Regis; Alves,Christiano Robles Rodrigues; Roschel,Hamilton; Benatti,Fabiana Braga; Takayama,Liliam; Pinto,de Sa; Lima,Fernanda Rodrigues; Pereira,Rosa Maria Rodrigues. Creatine supplementation and resistance training in vulnerable older women: a randomized double-blind placebo-controlled clinical trial. Experimental gerontology 2014;53(Journal Article):7-15. [DOI:]

Kandel 2014

Kandel R.; Chatterjee P.; Kumar V.; Gopalan V.; Ambashtha A.; Jathar S.; Dey A.B.. Impact of nutritional supplementation and nordic walking in frail older patients in geriatrics department of tertiary care hospital in India. European Geriatric Medicine 2014;5(Web Page):S127-S128. [DOI:]

Kim 2012

Kim,Hun Kyung; Suzuki,Takao; Saito,Kyoko; Yoshida,Hideyo; Kobayashi,Hisamine; Kato,Hiroyuki; Katayama,Miwa. Effects of exercise and amino acid supplementation on body composition and physical function in community-dwelling elderly Japanese sarcopenic women: a randomized controlled trial. Journal of the American Geriatrics Society 2012;60(1):16-23. [DOI:]

Kim 2012a

Kim H.. Interventions for frailty and sarcopenia in community-dwelling elderly women. Japanese Journal of Geriatrics 2012;49(6):726-730. [DOI:]

Kirn 2014

Kirn D.R.; Koochek A.; Reid K.F.; Von,Berens A.; Travison T.; Folta S.; Sacheck J.; Nelson M.; Liu C.K.; Phillips E.; Aberg A.; Nydahl M.; Gustafsson T.; Cederholm T.; Fielding R.A.. The Vitality, Independence, and Vigor in the Elderly 2 Study (VIVE2): Design and methods. European Geriatric Medicine 2014;5(Web Page):S202. [DOI:]

Kivipelto 2014

Kivipelto M.; Ngandu T.; Lehtisalo J.; Hanninen T.; Jula A.; Laatikainen T.; Lindstrom J.; Paajanen T.; Pajala S.; Peltonen M.; Stigsdotter-Neely A.; Levalahti E.; Strandberg T.E.; Tuomilehto J.; Soininen H.. A multidomain two-year randomized controlled trial to prevent cognitive impairment - The FINGER study. European Geriatric Medicine 2014;5(Web Page):S69. [DOI:]

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Kwon 2015

Kwon,Jinhee; Yoshida,Yuko; Yoshida,Hideyo; Kim,Hunkyung; Suzuki,Takao; Lee,Yunhwan. Effects of a combined physical training and nutrition intervention on physical performance and health-related quality of life in prefrail older women living in the community: a randomized controlled trial. Journal of the American Medical Directors Association 2015;16(3):263.e1-8. [DOI:]

Lammes 2012

Lammes,E.; Rydwik,E.; Akner,G.. Effects of nutritional intervention and physical training on energy intake, resting metabolic rate and body composition in frail elderly. a randomised, controlled pilot study. The journal of nutrition, health & aging 2012;16(2):162-7. [DOI:]

Li 2010

Li,Chia-Ming; Chen,Chin-Ying; Li,Chun-Yi; Wang,Wei-Dean; Wu,Shwu-Chong. The effectiveness of a comprehensive geriatric assessment intervention program for frailty in community-dwelling older people: a randomized, controlled trial. Archives of Gerontology and Geriatrics 2010;50 Suppl 1(Journal Article):S39-42. [DOI:]

Ng 2014

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Data and analyses

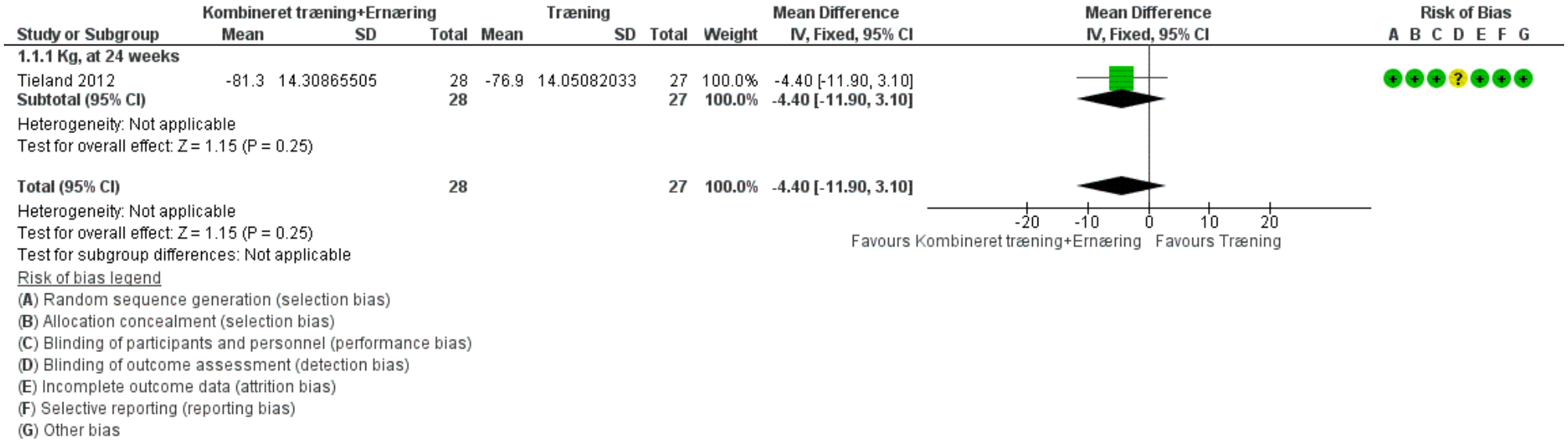
1 Kombineret træning+Ernæring vs Træning

Outcome or Subgroup	Studies	Participants	Statistical Method	Effect Estimate
1.1 Kropsvægt (Body weight) EOT	1	55	Mean Difference (IV, Fixed, 95% CI)	-4.40 [-11.90, 3.10]
1.1.1 Kg, at 24 weeks	1	55	Mean Difference (IV, Fixed, 95% CI)	-4.40 [-11.90, 3.10]
1.2 Kropsvægt (Body weight) LFU	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable

1.3 Muskelstyrke (Muscle strength) EOT	2	152	Std. Mean Difference (IV, Random, 95% CI)	-0.12 [-0.44, 0.19]
1.3.1 12-24 weeks	2	152	Std. Mean Difference (IV, Random, 95% CI)	-0.12 [-0.44, 0.19]
1.4 Muskelstyrke (Muscle strength) LFU	1	97	Mean Difference (IV, Fixed, 95% CI)	-1.70 [-4.06, 0.66]
1.4.1 Follow-up	1	97	Mean Difference (IV, Fixed, 95% CI)	-1.70 [-4.06, 0.66]
1.5 Mobilitet (Mobility) EOT	2	152	Mean Difference (IV, Random, 95% CI)	-0.18 [-0.58, 0.21]
1.5.1 12-26 weeks	2	152	Mean Difference (IV, Random, 95% CI)	-0.18 [-0.58, 0.21]
1.6 Livskvalitet (Quality of life) EOT	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
1.7 Livskvalitet, fysisk (Quality of life, physical) EOT	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
1.8 Livskvalitet, mental (Quality of life, mental) EOT	0	0	Mean Difference (IV, Fixed, 95% CI)	Not estimable
1.9 Hverdagsaktiviteter (Activities of daily living) EOT	1	97	Risk Ratio (IV, Fixed, 95% CI)	0.49 [0.09, 2.55]
1.9.1 Independency at 12 weeks	1	97	Risk Ratio (IV, Fixed, 95% CI)	0.49 [0.09, 2.55]
1.10 Hverdagsaktiviteter (Activities of daily living) LFU	1	97	Risk Ratio (IV, Fixed, 95% CI)	0.49 [0.09, 2.55]
1.10.1 Independency at 26 weeks	1	97	Risk Ratio (IV, Fixed, 95% CI)	0.49 [0.09, 2.55]
1.11 Kvalme (Nausea)	0		Risk Ratio (IV, Fixed, 95% CI)	No totals
1.12 Diarre (Diarrhea)	0		Risk Ratio (IV, Fixed, 95% CI)	No totals
1.13 Opkast (Vomit)	0		Risk Ratio (IV, Fixed, 95% CI)	No totals
1.14 Flatulens (Flatulence)	0		Risk Ratio (IV, Fixed, 95% CI)	No totals
1.15 Fald (Falls) EOT	1	97	Risk Ratio (IV, Fixed, 95% CI)	0.33 [0.04, 3.03]
1.15.1 Time	1	97	Risk Ratio (IV, Fixed, 95% CI)	0.33 [0.04, 3.03]

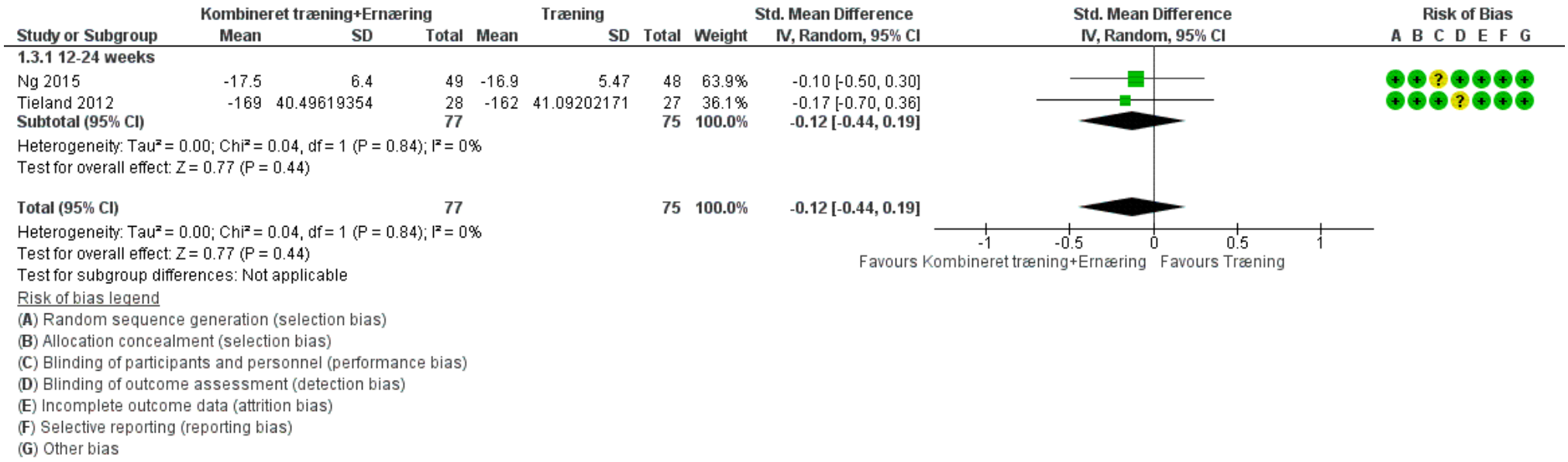
Figures

Figure 1 (Analysis 1.1)



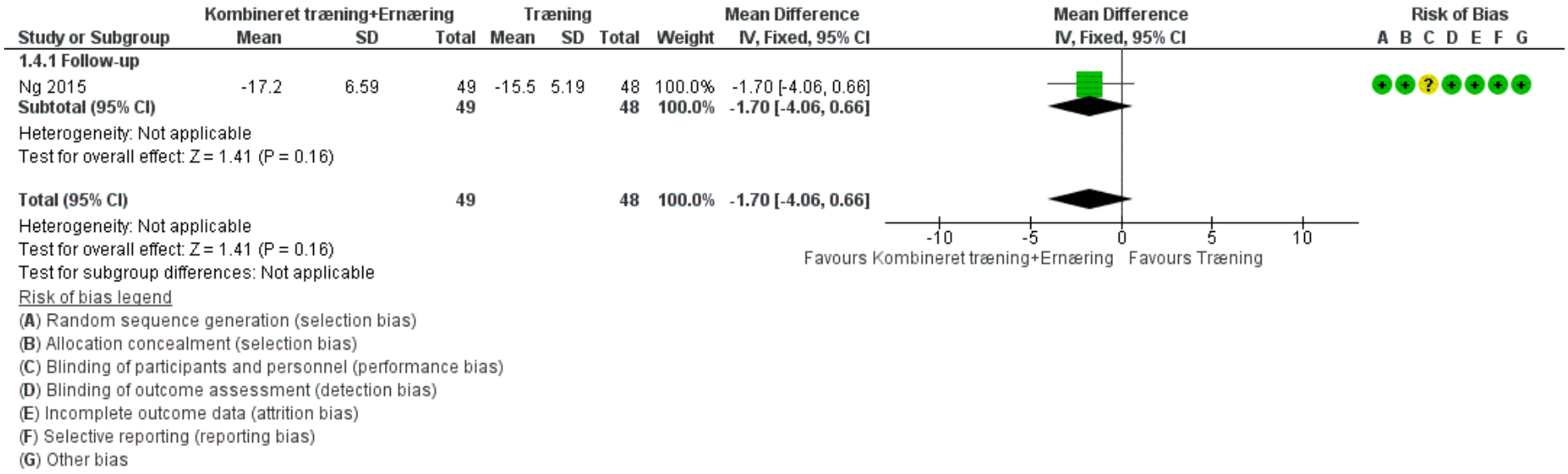
Forest plot of comparison: 1 Kombineret træning+Ernæring vs Træning, outcome: 1.1 Kropsvægt (Body weight) EOT.

Figure 2 (Analysis 1.3)



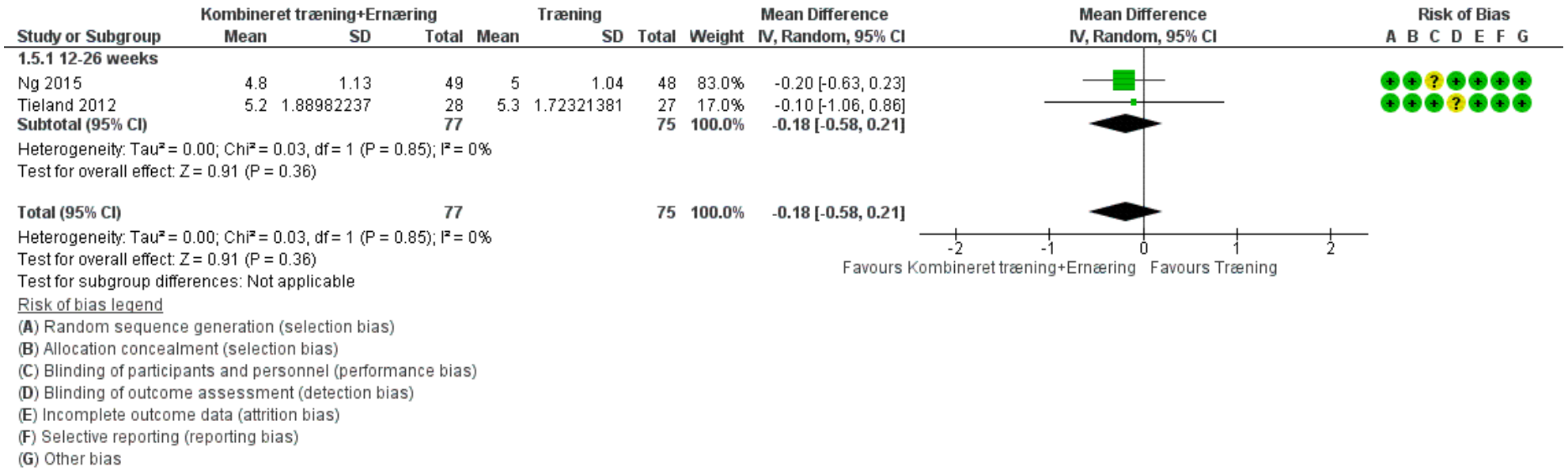
Forest plot of comparison: 1 Kombineret træning+Ernæring vs Træning, outcome: 1.3 Muskelstyrke (Muscle strength) EOT.

Figure 3 (Analysis 1.4)



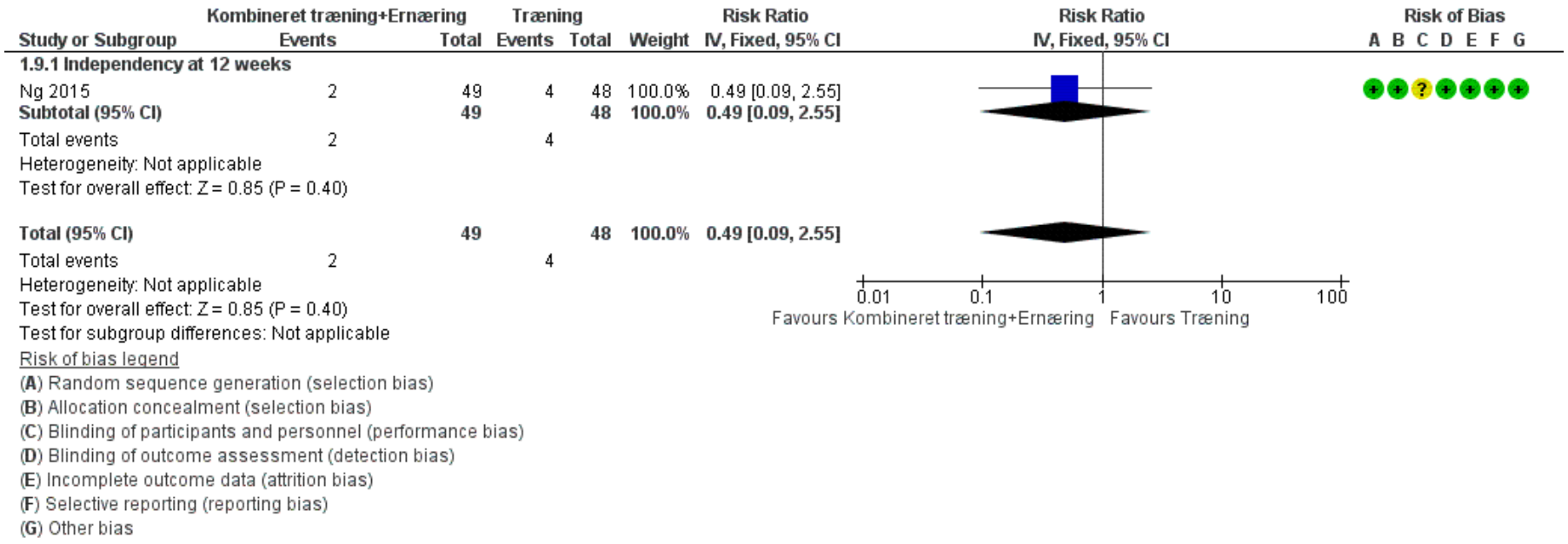
Forest plot of comparison: 1 Kombineret træning+Ernæring vs Træning, outcome: 1.4 Muskelstyrke (Muscle strength) LFU.

Figure 4 (Analysis 1.5)



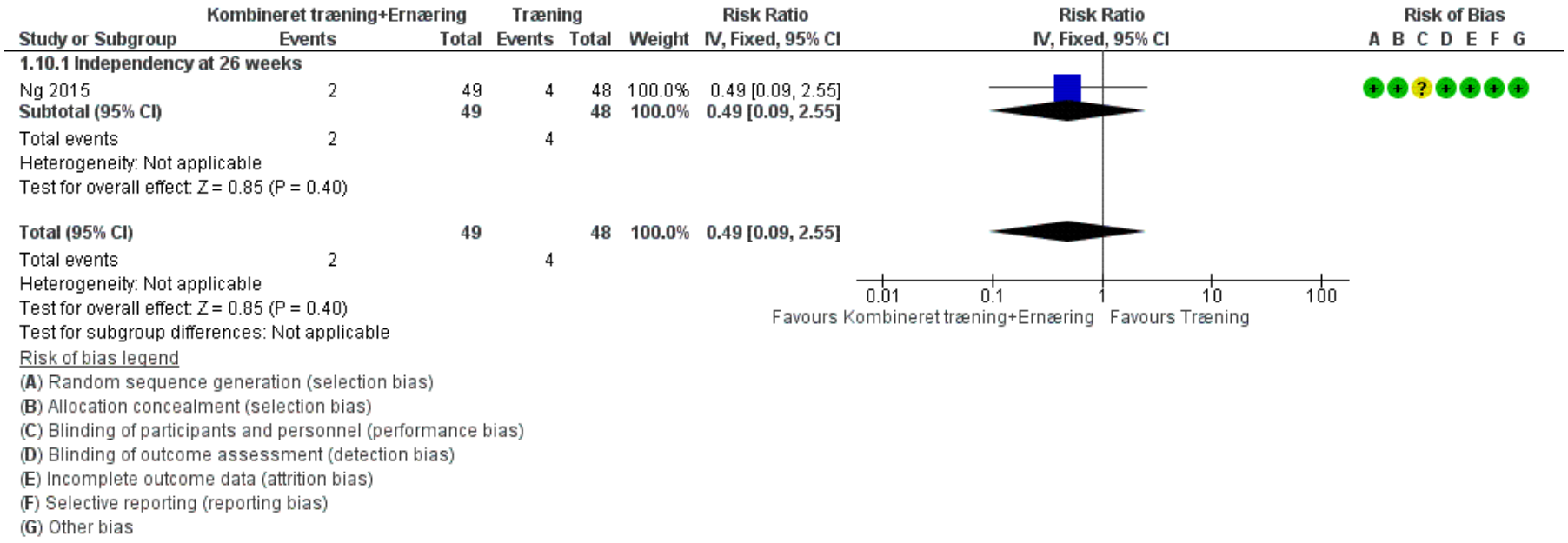
Forest plot of comparison: 1 Kombineret træning+Ernæring vs Træning, outcome: 1.5 Mobilitet (Mobility) EOT.

Figure 5 (Analysis 1.9)



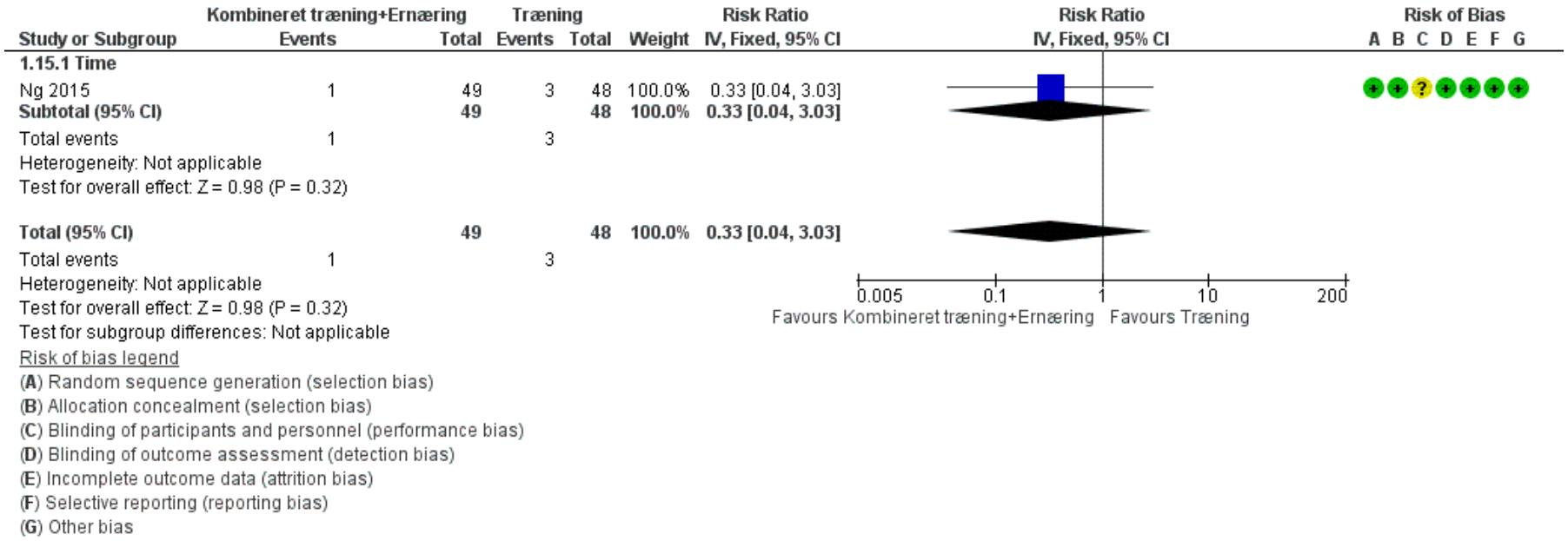
Forest plot of comparison: 1 Kombineret træning+Ernæring vs Træning, outcome: 1.9 Hverdagsaktiviteter (Activities of daily living) EOT.

Figure 6 (Analysis 1.10)



Forest plot of comparison: 1 Kombineret træning+Ernæring vs Træning, outcome: 1.10 Hverdagsaktiviteter (Activities of daily living) LFU.

Figure 7 (Analysis 1.15)



Forest plot of comparison: 1 Kombineret træning+Ernæring vs Træning, outcome: 1.15 Fald (Falls) EOT.