

Physical Activity Interventions in Childhood Obesity: A Systematic Review with Meta-analysis of Randomized Clinical Trials

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Conflict of Interest

- None declared

Introduction

- 2010:
 - 43 million children with overweight or obesity



35 million developing countries



Introduction

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 - 43 million children with overweight or obesity
- ↓
- 35 million developing countries
- Obesity is related with
 - Metabolic diseases
 - Cardiovascular outcomes



Introduction

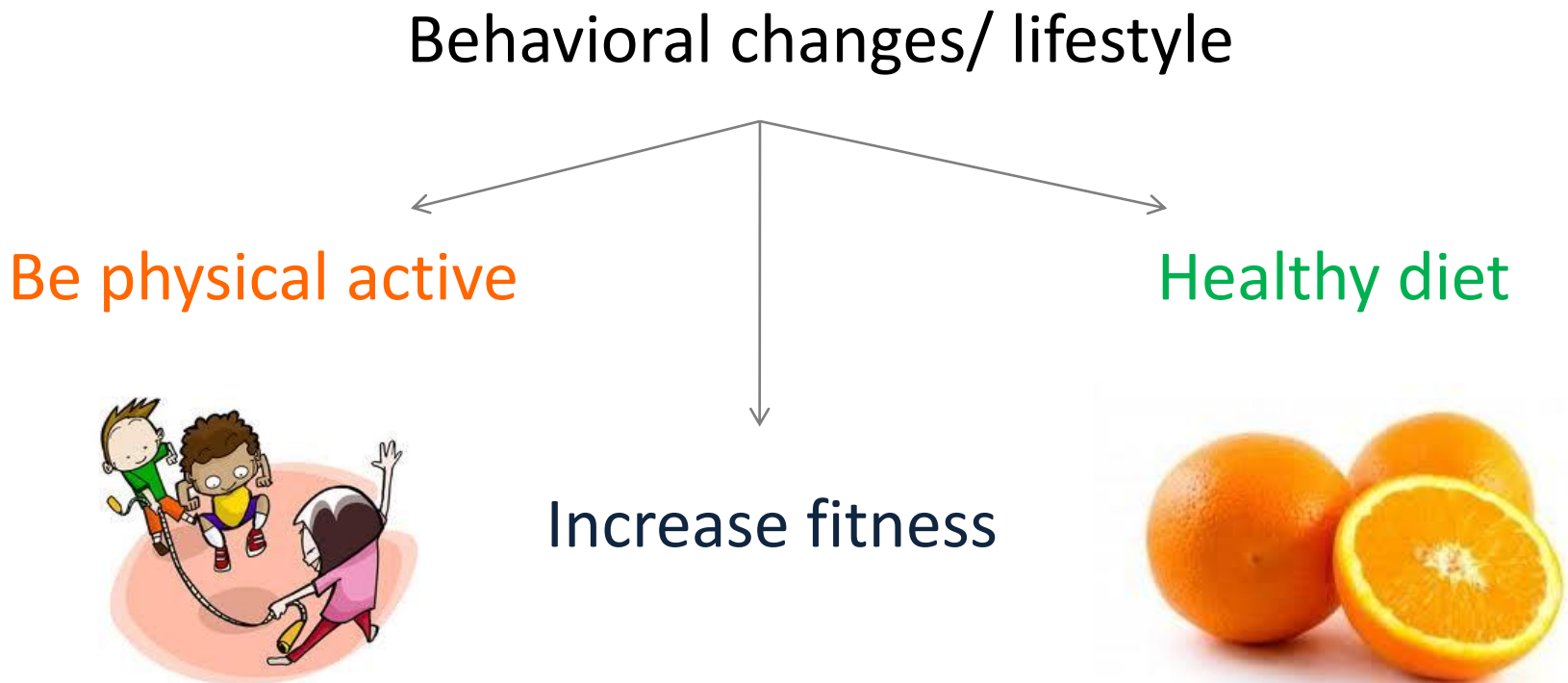
- Lifetime line:



- Primary Prevention:
 - Reduction the number of risk factors
- Secondary Prevention:
 - Prevent outcomes

Childhood Obesity: An Epidemiological Problem to Solve

- Main stem of intervention in childhood:



Physical Activity Intervention in Childhood Obesity

- However, the effectiveness of physical activity interventions for pediatric obesity remains unclear



Objective

- To assess the effect of physical activity interventions to prevent or treat childhood obesity by a systematic review and meta-analysis of Randomized Clinical Trials

Methods

- We performed a Systematic Review with Meta-analysis of RCTs in accordance with the Cochrane Collaboration recommendations.



Methods

- Inclusion Criteria:

- Population:

- Children: 6- to 12- years-old;

- Intervention:

- physical activity interventions longer than 6 months;

- Comparison:

- control group;

- Outcomes:

- Body Mass Index (BMI), Blood Pressure (BP), Total cholesterol (TC), Triglycerides (TG);

- Studies:

- RCTs;

Data Sources

- On-line databases:

- MEDLINE (PubMed)
- EMBASE
- Cochrane CENTRAL



from inception until
March 2010

- Hand Search:

- References from studies and reviews included

- Language:

- No language restrictions

Search Strategy

- Terms (MeSH Terms):
 - #1 Search obesity OR overweight
 - #2 Search Child Nutrition Disorders OR child\$ OR school OR student\$
 - #3 Search (randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized controlled trials[mh] OR random allocation[mh] OR double-blind method[mh] OR single-blind method[mh] OR clinical trial[pt] OR clinical trials[mh] OR ("clinical trial"[tw]) OR ((singl*[tw] OR doubl*[tw] OR trebl*[tw] OR tripl*[tw]) AND (mask*[tw] OR blind*[tw])) OR ("latin square"[tw]) OR placebos[mh] OR placebo*[tw] OR random*[tw] OR research design[mh:noexp] OR comparative studies[mh] OR evaluation studies[mh] OR follow-up studies[mh] OR prospective studies[mh] OR cross-over studies[mh] OR control*[tw] OR prospectiv*[tw] OR volunteer*[tw]) NOT (animal[mh] NOT human[mh]))
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Robinson & Dickersin, *Int J Epidemiol*, 2002, 31(1), 150.

Data Selection

- Data Selection Flow:

- 
- Titles and abstracts;
 - Full paper;
 - Included papers that matched inclusion criteria;
 - Disagreements between reviewers were solved by consensus, and, if disagreement persisted, by a third reviewer.

Data Selection

- Study Quality Assessment:
 - Sequence generation;
 - Allocation concealment;
 - Blinding;
 - Blinding of outcomes assessors;
 - Use of intention-to-treat analysis;
 - Description of losses and exclusion.

Data Extraction

- Data Extraction
 - It was independently performed by two reviewers;
 - Standardized form;
 - PICOS.



Data Analysis

- Physical activity intervention vs. Control Group
- Pooled-effect estimates were obtained using the final values;

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- Physical activity intervention vs. Control Group
- Pooled-effect estimates were obtained using the final values;
- Random-effect model;
- Continuous outcomes:
 - results were presented as weighted mean difference with 95% confidence intervals (CIs).

Data Analysis

- Heterogeneity:
 - Inconsistency I^2 test
- Analysis Software:
 - Stata 9.0

Results

Flow diagram of included studies

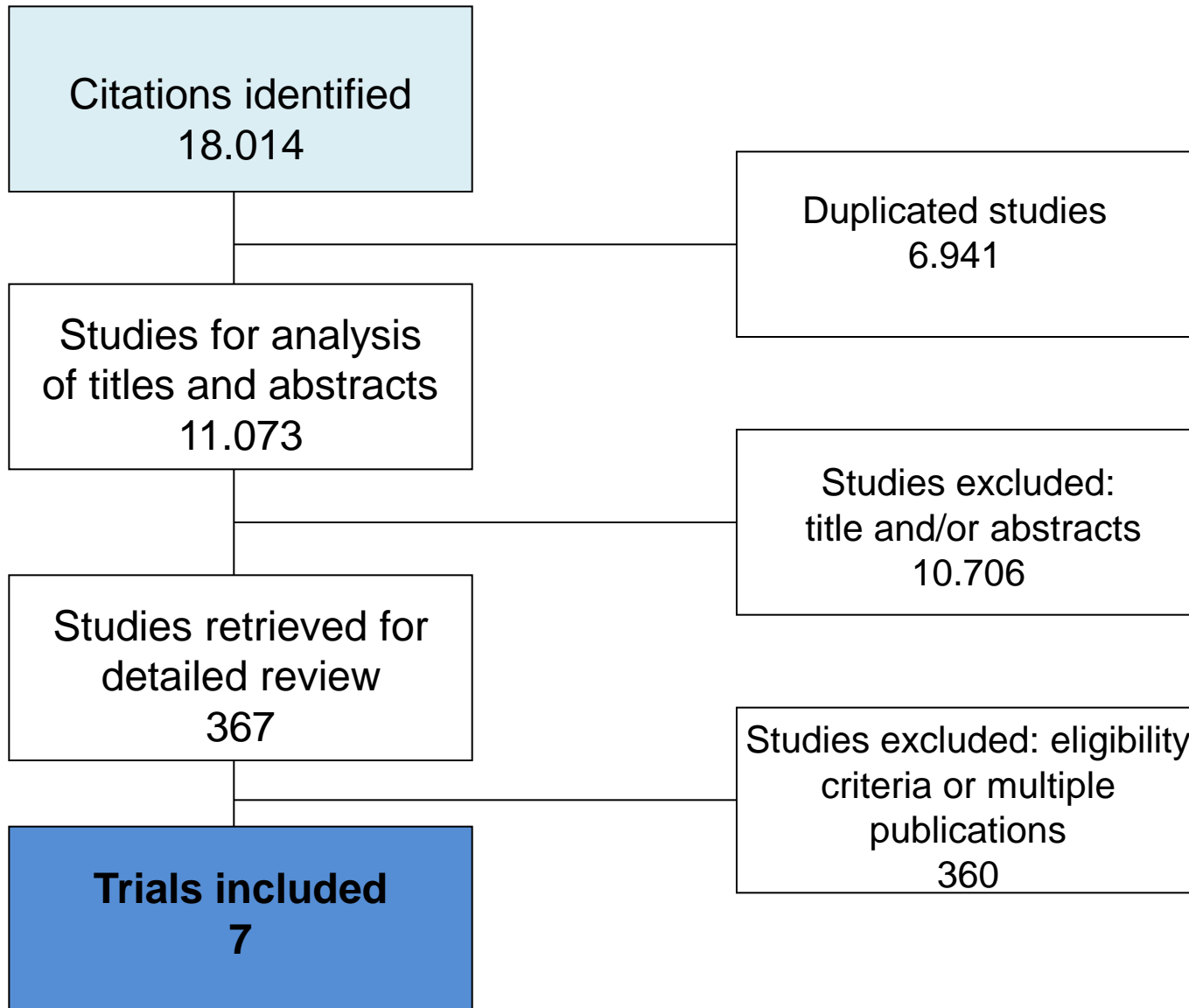
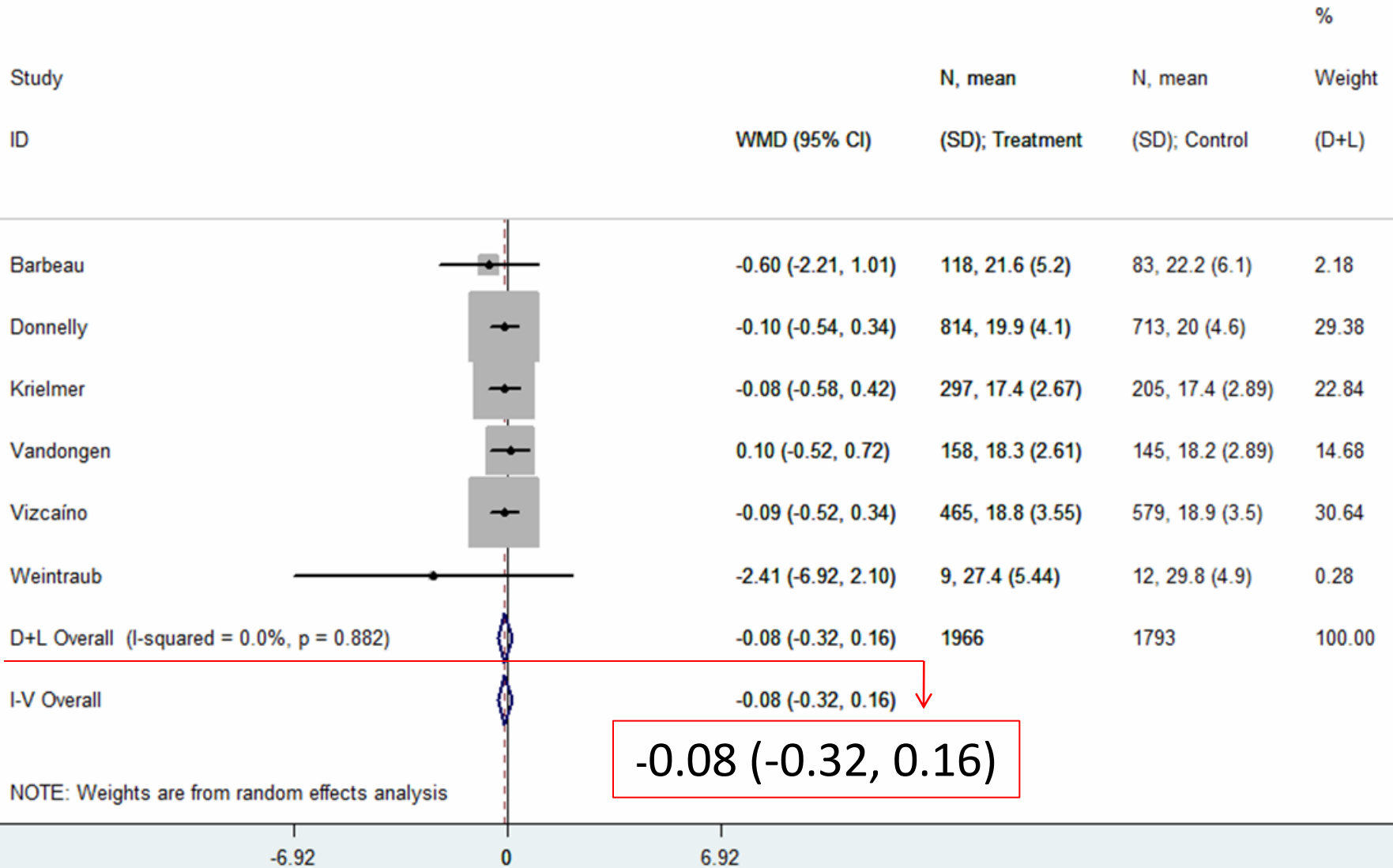


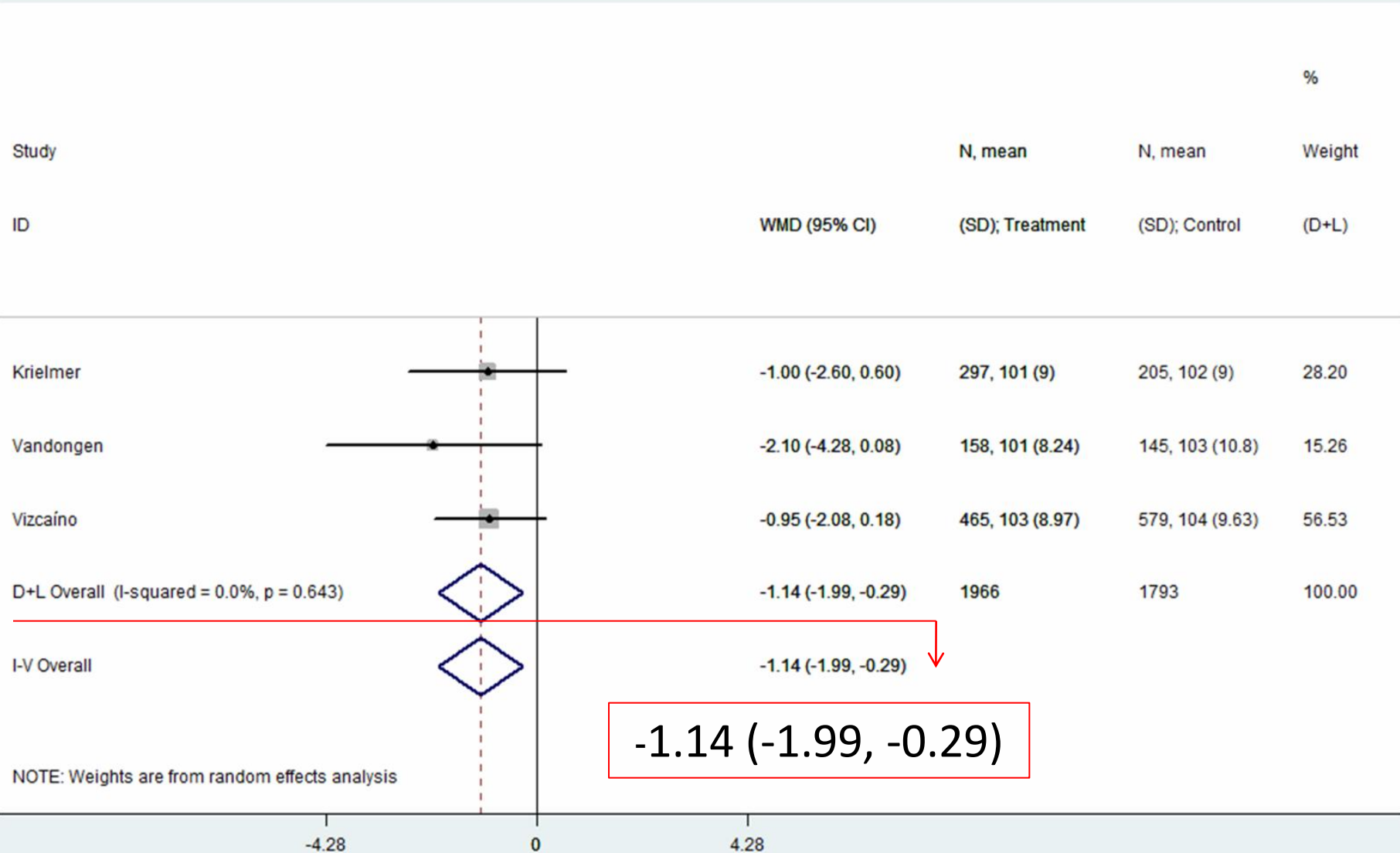
Table 1 - Risk of bias of included studies

Study, year	Adequate Sequence Generation	Allocation Concealment	Blinding of Investigator	Blinding of Participant	Blinding of Assessors	Blinding of Outcome Assessors	Intention-to-treat Analysis	Description of Losses and Exclusions
Vandongem et al., 1995	Not reported	Not reported	Not reported	Not reported	Yes	Unclear	No	Yes
Barbeau et al., 2007;	Not reported	Unclear	Not reported	Not reported	Not reported	Not reported	Yes	Yes
Vizcaíno et al., 2007	Yes	Unclear	No	No	No	Not reported	Yes	Yes
Weintraub et al., 2008	Yes	Unclear	No	No	No	Not reported	Yes	Yes
Donnelly et al., 2009	Not reported	Unclear	No	No	Yes	Not reported	Not reported	Yes
Walther et al., 2009	Not reported	Unclear	No	No	Yes	Not reported	Yes	Yes
Kriemler et al., 2010	Yes	Adequate	No	No	Yes	Not reported	Yes	Yes

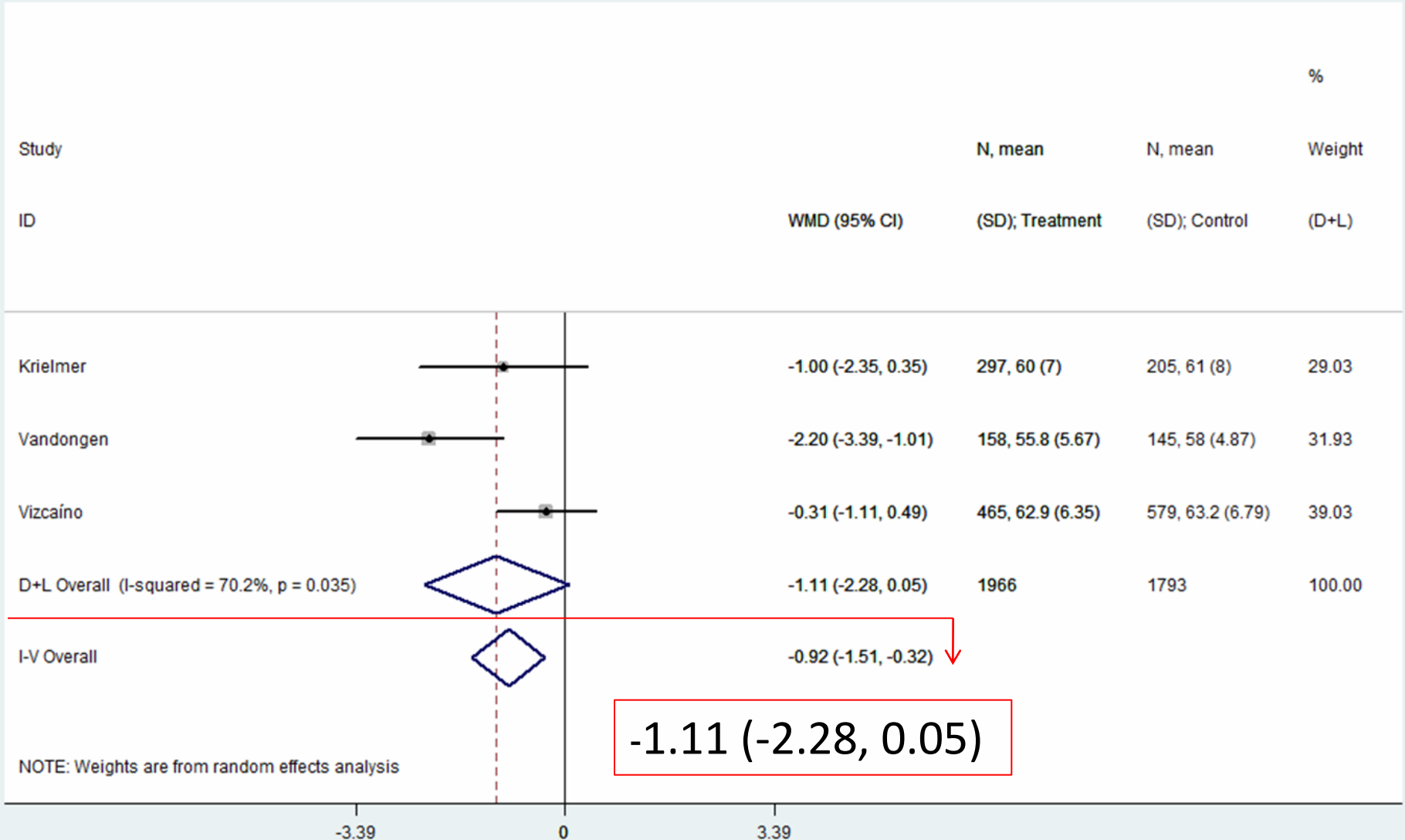
BMI



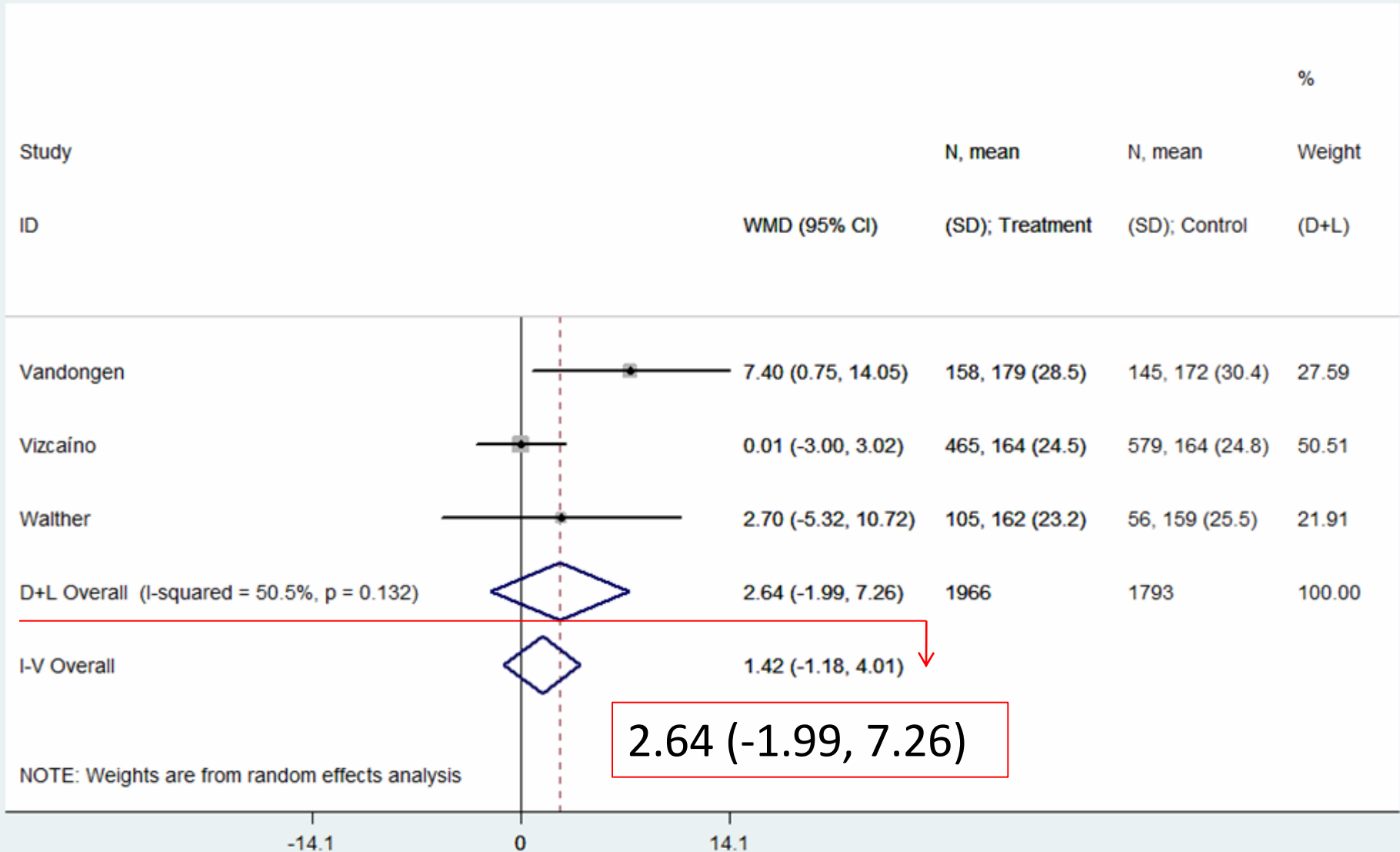
Systolic Blood Pressure



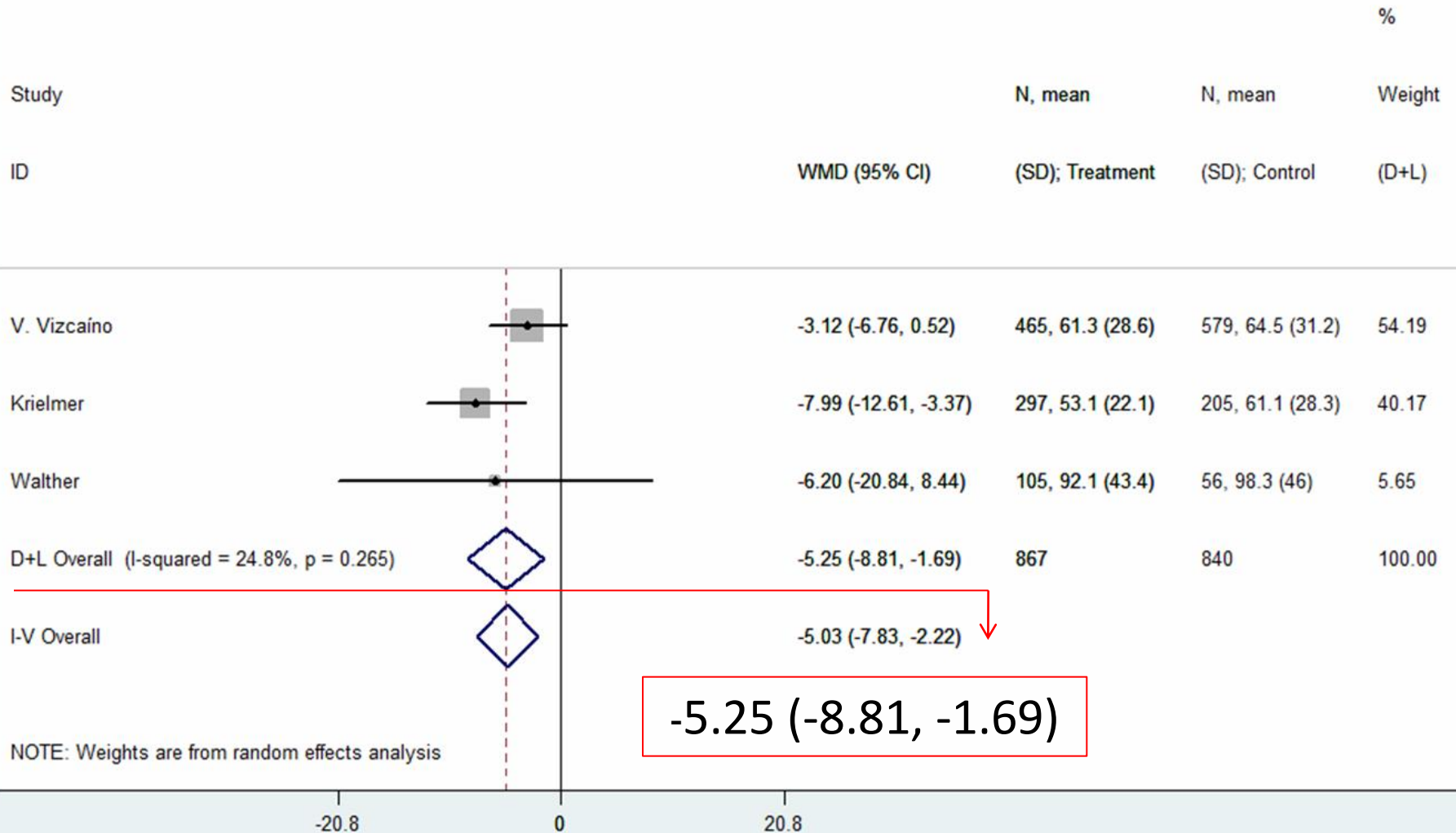
Diastolic Blood Pressure



Total Cholesterol



Tryglicerides



-5.25 (-8.81, -1.69)

Conclusions

- Physical activity intervention programs longer than 6 months showed no significant effect on BMI, but caused small changes on triglycerides and blood pressure compared with control group.

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- Physical activity intervention programs longer than 6 months showed no significant effect on BMI, but caused small changes on triglycerides and blood pressure compared with control group.
- New approaches, including trials with greater exercise intensity and association of more comprehensive strategies are needed to improve these results.

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