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Title	**Prevention of overweight/obesity in adult populations: a systematic review with meta-analyses**
Authors	Leslea Peirson, James Douketis, Donna Ciliska, Donna Fitzpatrick-Lewis, Ali Usman, Parminder Raina
Reviewer 1	**Wei He**
Institution	None listed.
General comments	This is an interesting Meta analyses to synthesize evidence on behavioral intervention for preventing weight gain. However, there are major issues that need to be taken into account. 1. The authors stated that the key question for this study is: Do preventive interventions in normal weight adults lead to short-term or sustained weight gain prevention? But unfortunately, only one single study was found that included only normal weight adults, others 25 studies all included subjects classified as overweight or obese. It seems like that the current data are not sufficient enough to investigate the proposed question. I would suggest the authors to weaken the emphasis on normal weigh, extending the research question to the whole adult population. 2.Preventive interventions' short-term effect was included as one of the paper's aims in the authors' key question, but papers with <12 months outcomes were excluded. It seems controversial to me. 3.The authors define "normal weight" as a BMI between 1.85 kg/m2 and 24.9 kg/m2. However, the BMI cutoffs for overweight may differ across different ethnic populations, such as China define overweight as BMI ≥24 kg/m2. Since studies conducted in all ethnicity all included in this study. This ethnic heterogeneity in overweight/obesity should be discussed. 4.The authors mentioned that Egger's test was used to investigate the publication bias. However, I cannot find any information regarding this in the text. Furthermore, the publication bias may also result from the language limitation of English and French. Please discuss this issue in your revised manuscript. 5.The discussion of the between-study heterogeneity in the current version is not sufficient. Various factors, including different intervention strategies, publications years, regions or countries, age groups of the subjects, can affect the generalization of the results. Meta-regression may help.
Reviewer 2	**Alex Schwartz**
Institution	University of Ottawa, School of Human Kinetics
General comments	The paper "Prevention of Overweight/Obesity in Adult Populations: A Systematic Review with Meta-analyses" by Peirson et al. presents a summary of evidence pertaining to the efficacy of behavioural based intervention on anthropometric and metabolic outcomes in adults. The authors should be commended on the amount of work that has already been put into the paper and they raise some interesting issues with regards to these type of interventions. The amount of transparency provided by the authors with their search is also greatly appreciated. I do feel that there needs to be more work put into this paper in order to make it more clear and answer some important questions. I understand the need for breadth during the search process, however based on your criteria it wouldn't make sense to include children into the search unless there is more to this review. I would suggest presenting these results in the paper and presenting this in a separate section. Furthermore, in the methodology, part of the exclusion/inclusion criteria is that trials had to randomized in adults with a BMI of 18-24.9kg/m2, however it seems that overweight subjects were later included due to a lack of data. Either include overweight subjects in your study and change the focus to all subjects, or exclude them. Though the authors state the focus is on normal weight adults, the methodology indicates otherwise and this makes it somewhat confusing to the reader. I think this is an opportunity to address whether behavioural interventions are capable of preventing further weight gain in obese and, even more importantly, determining whether formerly obese individuals are any different from normal weight subjects with respect to behaviour based interventions. I would suggest adding this component to the analysis. Other revisions & concerns: - Pg 4, Ln 46-49: Don't posit as a question, but rather make this a statement, ie " While prevention is ideal, it remains to be determined… etc." -Pg 10, Ln 36-41: We know that males with higher testosterone levels have a decreased risk of weight regain after a weight loss intervention in comparison to low testosterone. I would like to see a smaller comparison- see if you can tease out data in studies that

	used both men and women but provided differences between sexes within the studies. -Pg 10, Ln 45-51: Would it be possible to include a comparison of studies showing interventions of less than one year vs. 1+? This could help in determining whether the actual length of the programs is an important factor. -Did any of these studies control for whether NW subjects were ever NW or obese? We know that formerly obese have compromised metabolic rates in comparison to never-obese/OW, and thus this could change the long-term outcome. Please discuss. -Is it possible to generate a forest plot for the outcomes? The necessary data seems available and I would suggest using this tool to illustrate the meta-analysis more effectively.
Author response	Major Points 1. One of the conditions of the expanded criteria was that at least one study arm have a baseline mean BMI <25 or baseline mean BMI >25, but minus one SD <25, or the number or percentage of normal weight participants was specified. Please provide your rationale for this particular expanded criterion. ARR 1: No longer applicable with revised focus only on normal weight adults. 2. The editors understand the reasoning for revising the search criteria; however, we felt that as justification, it would be necessary to extract a substantial amount of weight-specific data from the specific studies in the appendices on weight and place them into the main Results text to ensure the clarity and transparency of your case. ARR 2: No longer applicable with revised focus only on normal weight adults. 3. Please include more information on the interventions in the Results portion of the paper. This should be sketched out in the abstract and elaborated in the text. It is not sufficient to leave this information in a long appendix for the reader to discern. ARR 3: Details about the intervention in the included study have been added to the abstract and the results section. 4. The PICOS statement of the paper is not very clear. ARR 4: A PICOS section was added to the Methods and Box 1 was added to give more detail for each component. 4a. The inclusion and exclusion criteria need to be clarified and simplified in the Methods section. ARR 5: An inclusion/exclusion section was added to the Methods and Box 2 was added to provide more details. 4b. On page 6 of the methods, please explain why you have chosen to exclude studies conducted in hospital and institutional settings, as these settings would appear to be feasible for referral from primary care, as stipulated in the inclusion criteria. ARR 6: See Boxes 1 and 2. We excluded clinical institutions (hospital, metabolic units) as we believed these were unlikely to be primary prevention programs, but with mostly overweight people. 6 5. The editors felt a more clinically relevant outcome would have focused on how long it takes a normal weight person to become overweight and how do interventions modify the time to that outcome. Has this ever been studied? If not, it would be worth stating so in the Interpretation section of the manuscript. ARR 7: We agree this is a clinically important question but the evidence gathered for our review does not answer this question. Our search did not look for studies on this topic as such we cannot comment on whether it has or has not been studied. 6. Abstract does not adequately describe the population in question, and needs to be expanded. ARR 8: As per the new direction of the manuscript the abstract indicates the population in question is “normal weight adults.” 7. Some results may be easier to understand if presented in Forest Plot form as opposed to tables. ARR 9: No longer applicable with revised focus. However, a forest plot was added to present results of the single study included in the new version (see Figure 2) 8. The flow diagram should appear in the main document and not in an appendix. ARR 10: Flow diagram added to manuscript as Figure 1. 9. It is unfortunate that an English-French filter has been applied to the search. The

	number of papers that were excluded because of the language bias of the search should be quantified and presented. This should also be mentioned specifically in the Limitations section. ARR 11: The language filter was applied because of limited resources available to appropriately handle (e.g., screening, translation, interpretation) papers in multiple languages. The filter was added in the search therefore citations in other languages would not have been picked up and therefore we cannot quantify how many were excluded. The limitations section mentions the language restriction.' 10. Please include an explanation in the Methods section as to where this study fits into the grander scheme of your research. It is not clear from the manuscript why searches for obesity prevention and treatment would be performed in children, given the title and objective of this manuscript. ARR 12: The search strategy includes details that indicate the adult prevention review was one of four simultaneous reviews commissioned by the Canadian Task Force on Preventive Health Care to inform development of their guidelines. Other Minor Points 1. Please ensure your final word count is below 2500 words and the abstract is about 250 words. ARR 13: Word counts meet requirements. 2. Abbreviations: For only the most standard abbreviations (i.e., 95% CI, SD, OR, RR, HR), please spell out at first mention and include the abbreviation in parentheses. The abbreviations may be used throughout the remainder of the manuscript. Please remove all other abbreviations. ARR 14: Abbreviations edited as requested. 3. Please include up to 1 academic and 1 professional degree after each author's name. ARR 15: Degrees are listed appropriately. 4. Please provide a contributors' statement, a funding statement, (which includes a comment on the role of the funder) and a competing interests' statement at the end of your manuscript. ARR 16: Statements added to end of manuscript as requested. 5. Please structure the Interpretation section (discussion) into the following 4 main categories: main findings; explanation and comparison with other studies; limitations; and conclusions and implications for practice and future research. ARR 17: Interpretation section structured and sub-titled as requested. 6. Please use plain numbers in brackets for your references and do not use automatic numbering of field codes as these do not carry over well into our publishing software. ARR 18: references presented as requested. 7. Please include a checklist (if applicable for your study type) from the appropriate reporting guideline. ARR 19: PRISMA completed and submitted with revised manuscript Statistician's Comments to Authors perform a sensitivity analysis to define the standard deviation in this study. ARR 20: No longer applicable with revised focus only on normal weight adults. Reviewer #1 Comments to Authors 1. The authors stated that the key question for this study is: Do preventive interventions in normal weight adults lead to short-term or sustained weight gain prevention? But unfortunately, only one single study was found that included only normal weight adults, the other 25 studies all included subjects classified as overweight or obese. It seems like that the current data are not sufficient enough to investigate the proposed question. I would suggest the authors to weaken the emphasis on normal weight, extending the research question to the whole adult population. ARR 21: As noted in revision/response #1 the decision taken was to revise the manuscript focusing only on normal weight adults as specified in the key question of the review. In the discussion section we mention other reviews that examine interventions for weight gain prevention in general (mixed weight) populations.

	2. Preventive interventions' short-term effect was included as one of the paper's aims in the authors' key question, but papers with <12 months outcomes were excluded. It seems controversial to me. ARR 22: For weight gain prevention, the clinicians on the working group felt that <12 months was not a clinically important time frame. Short term was defined as >12 months. 3. The authors define "normal weight" as a BMI between 18.5 kg/m2 and 24.9 kg/m2. However, the BMI cutoffs for overweight may differ across different ethnic populations, such as China define overweight as BMI ≥24 kg/m2. Since studies conducted in all ethnicity all included in this study. This ethnic heterogeneity in overweight/obesity should be discussed. ARR 23: We agree that BMI criteria change with populations. We do not believe we missed studies of weight gain prevention due to this definition of normal weight. 4. The authors mentioned that Egger's test was used to investigate the publication bias. However, I cannot find any information regarding this in the text. Furthermore, the publication bias may also result from the language limitation of English and French. Please discuss this issue in your revised manuscript. ARR 24: No longer applicable. 5. The discussion of the between-study heterogeneity in the current version is not sufficient. Various factors, including different intervention strategies, publications years, regions or countries, age groups of the subjects, can affect the generalization of the results. Meta-regression may help. ARR 25: No longer applicable Reviewer #2 Comments to Authors 1. I understand the need for breadth during the search process; however based on your criteria it wouldn't make sense to include children into the search unless there is more to this review. I would suggest presenting these results in the paper and presenting this in a separate section. ARR 26: See ARR 12 2. Furthermore, in the methodology, part of the exclusion/inclusion criteria is that trials had to randomize adults with a BMI of 18-24.9kg/m2, however it seems that overweight subjects were later included due to a lack of data. Either include overweight subjects in your study and change the focus to all subjects, or exclude them. Though the authors state the focus is on normal weight adults, the methodology indicates otherwise and this makes it somewhat confusing to the reader. I think this is an opportunity to address whether behavioural interventions are capable of preventing further weight gain in obese and, even more importantly, determining whether formerly obese individuals are any different from normal weight subjects with respect to behaviour based interventions. I would suggest adding this component to the analysis. ARR 27: As per ARR 1 the decision was to exclude studies that included overweight and obese – population was limited to normal weight adults. 3. Pg 4, Ln 46-49: Don't posit as a question, but rather make this a statement, ie "While prevention is ideal, it remains to be determined… etc." ARR 28: Edited as suggested. 4. Pg 10, Ln 36-41: We know that males with higher testosterone levels have a decreased risk of weight regain after a weight loss intervention in comparison to low testosterone. I would like to see a smaller comparison- see if you can tease out data in studies that used both men and women but provided differences between sexes within the studies. ARR 29: No longer applicable. 5. Pg 10, Ln 45-51: Would it be possible to include a comparison of studies showing interventions of less than one year vs. 1+? This could help in determining whether the actual length of the programs is an important factor. ARR 30: No longer applicable. 6. Did any of these studies control for whether NW subjects were ever NW or obese? We know that formerly obese have compromised metabolic rates in comparison to never-obese/OW, and thus this could change the long-term outcome. Please discuss. ARR 31: The single study included in the revised manuscript did not control for this but

	they do indicate (as do we) there were significant baseline differences between groups in terms of prior experience with formal weight loss interventions (more in control than in experimental) – however, it would only be an assumption that these participants were ever obese. 7. Is it possible to generate a forest plot for the outcomes? The necessary data seems available and I would suggest using this tool to illustrate the meta-analysis more effectively. ARR 32: See ARR 9