

Effects of physical exercise during pregnancy on mothers? and neonates? health: A protocol for an umbrella review of systematic reviews and meta-analysis of randomised controlled trials

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Introduction A growing interest has emerged on the effects of exercise during gestation. Several systematic reviews and meta-analyses have shown that prenatal exercise could reduce the mothers' risk for some disorders. Despite this, evidence regarding the risk of caesarean section, birth weight or Apgar score at delivery is still controversial. Furthermore, practitioners are reluctant to recommend exercise to pregnant women suffering from some disorders, such as hypertension, pre-eclampsia or pregnant women with obesity. Moreover, the scarcity of studies addressing the risks and benefits of exercise at higher intensity prevent practitioners from recommending it at higher dosages. Umbrella reviews represent an appropriate design to elucidate the reasons behind the contradictory findings of previous systematic reviews. **Methods** This protocol was developed according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols and the Cochrane Collaboration Handbook. Medline, EMBASE, Web of Science, Cochrane database of systematic reviews, Epistemonikos, Prospero register and SPORTDiscuss databases will be searched to identify systematic reviews, meta-analyses and randomised controlled trials that examine the effect of exercise on pregnancy outcomes from inception to August 2019. Searches will be conducted from September to November 2019. **statistical analysis** Methodological quality will be evaluated using the AMSTAR 2 tool. The certainty of evidence and strength of recommendations for meta-analyses will be assessed by the Grading of Recommendations Assessment, Development

and Evaluation framework. The summary effect sizes will be calculated through the use of random-effects and fixed-effects models. Heterogeneity among studies will be assessed using the I² statistic, and evidence of excess significance bias and evidence of small study effects will also be evaluated. Ethics and dissemination Ethical approval will not be needed for this review protocol. The results will be disseminated to academic audiences by peer-reviewed publications. Furthermore, results will be disseminated to clinical audiences through professionals' associations and social networks, and may influence guidelines developers in order to improve outcomes in mothers and offspring. © Author(s) (or their employer(s)) 2019.