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156 The Effectiveness of Physical Activity Interventions to Reduce Blood Pressure in Young Adults with Increased Cardiovascular Risk: A Systematic Review and Meta-Analysis

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Introduction Young adults with cardiovascular risk factors, such as hypertension, may gain long-term risk benefits from effective targeted lifestyle interventions. We compared the effectiveness of lifestyle interventions with defined physical activity components targeting change in blood pressure, in young adults (aged 20 to 40) with established cardiovascular risk factors.

Methods We searched databases including CENTRAL, MEDLINE, EMBASE, CINAHL (from earliest dates available to May 2014) and assessed reference lists of relevant articles for potential titles. Study selection criteria including: randomised control trials with at least 12 weeks follow-up; reporting blood pressure as the primary outcome; targeting participants aged between 20 to 40 years or within one standard deviation of this age range. Four authors (WW, PK, AL, HR), independently screened the eligibility of trials. Titles selected for full review were discussed and disagreement settled with an independent pair of authors (CF and PL). Meta-analysis was completed using Review Manager (RevMan) Version 5.2 using a random effects model imputing post intervention blood pressures. Study protocol available on PROSPERO 2014:CRD42014009604.

Results 13 studies satisfied all inclusion criteria, baseline mean age of participants was 42.7 years (SD 6.4) (n = 3338). 11 trials targeted increased moderate to vigorous physical activity (MVPA) either via supervised exercise (n = 8) or via behavioural counselling (n = 3). One trial investigated effects of resistance exercise and 1 study implemented a yoga trial. Meta-analysis was restricted to the trials targeting increased MVPA with analysis performed according to duration of follow-up. In total 10 studies (n = 2716) reported 3 to 6 months outcomes, mean reduction in systolic BP was -4.4 mmHg (95% CI -5.8 to -3) and mean reduction in diastolic BP was -4.3 mmHg (95% CI -5.6 to -3.0). The effects of intervention on blood pressure at 3 to 5 year follow-up (3 studies, n = 2553) was positive but with significant heterogeneity. Mean reduction in systolic BP was -1.3 mmHg (95% CI -2.9 to 0.3 , I^2 80%) and mean reduction in diastolic BP was -1.2 mmHg (95% CI -2.3 to -0.2 , I^2 74%).

Conclusions Our review found that interventions targeting an increased dose of MVPA through supervised and self-directed programmes achieved significant short-term improvements in blood pressure. However, studies targeting blood pressure reduction in participants below the age of 40 years with cardiovascular risk factors are limited in number. The clinical and statistical heterogeneity of the studies limits conclusions on the effectiveness of individual components of the interventions. It remains unclear how to translate short-term intervention effects into sustained reduction in blood pressure and cardiovascular risk. As understanding increases of young adult populations predisposed to early cardiovascular disease more research is needed on primary and secondary prevention in these groups.