

The effect of increased fruit and vegetable consumption on systolic and diastolic blood pressure in six randomized controlled fruit and vegetable intervention trials: a pooled analysis

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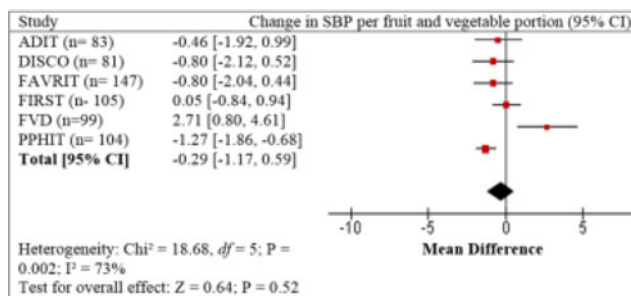
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Observational evidence consistently shows that increasing fruit and vegetable (FV) consumption is associated with reduced risk of chronic diseases, including hypertension, as these foods are important sources of micronutrients, dietary fibre, and phytochemicals and are low in energy density. Assessment of dietary intake is difficult and there are many sources of error, while observational studies cannot demonstrate cause and effect. The aim of this analysis was to use data from six FV trials to examine the effect of increasing FV intake on systolic blood pressure (SBP) and diastolic blood pressure (DBP).

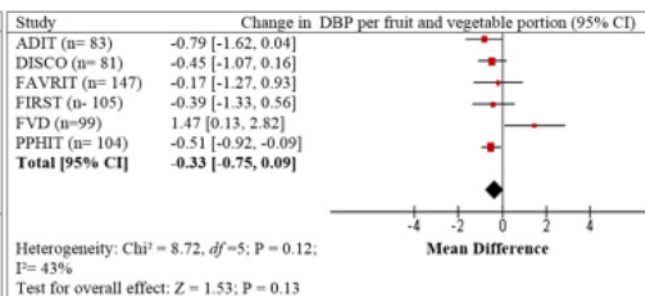
The six randomized controlled trials (FVD⁽¹⁾, FAVRIT⁽²⁾, DISCO⁽³⁾, PPHIT⁽⁴⁾, FIRST⁽⁵⁾ and ADIT⁽⁶⁾) were carried out in a range of populations but were of similar duration and used comparable methods to achieve dietary change and for outcome assessment. FV were supplied free of charge to participants and self-reported intake was assessed via either diet history or food diary. SBP and DBP were recorded using automated sphygmomanometers.

Changes in SBP and DBP were each regressed on change in self-reported FV intake, the slope providing an estimate of the change in each variable associated with a one portion change in self-reported FV intake. The slopes and their standard errors from the six trials were then inputted into Revman v. 5.3 and a random effects model used to pool results. Tests for heterogeneity of slopes between studies were performed and forest plots generated, as shown below. A p-value of <0.05 was considered statistically significant for testing the pooled results.

The pooled regression results for the six trials showed that there was no significant decrease in either SBP or DBP per one portion increase in FV, although there was evidence of significant heterogeneity across studies ($I^2 = 73\%$, 43% respectively).



A forest plot showing mean differences in systolic blood pressure (mm Hg) per 1 portion increase of fruit and vegetables in 6 randomized control trials



A forest plot showing mean differences in diastolic blood pressure (mm Hg) per 1 portion increase of fruit and vegetables in 6 randomized control trials

In conclusion, pooled regression analysis of six FV trials showed no statistically significant effect of increased FV intake on SBP or DBP, with significant between study heterogeneity.

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