

Supplementary Analysis

Meta-regression of the association of changes in physical activity levels with changes in health and wellbeing outcomes of persons undergoing exercise referral schemes for those schemes where both variables were collected and sufficient scheme numbers were available.

Statistical Analyses

Two stage individual patient data meta-regression was performed on the change scores (i.e. post- minus pre-ERS scores) for each outcome measure. For stage one, change scores and their standard errors were derived for each scheme. For all health and wellbeing outcomes, change scores were calculated in their raw units of measurement. For physical activity levels median change scores, (i.e. post- minus pre-ERS scores) for MET-minutes, as well as the breakdown of vigorous and moderate intensity activity, walking, and sitting minutes were used for calculation of within scheme effect sizes (*d*) were using the change score standard deviations as the denominator to characterize the magnitude of effect relative to its variability. The second stage involved performing a mixed effects meta-regression using the ‘metafor’ package in R (version 3.5.0; R Core Development Team, <https://www.r-project.org/>) examining the association between changes in physical activity levels as a moderator upon changes in health and wellbeing outcomes. Estimates were weighted by inverse sampling variance and restricted maximal likelihood estimation was used in all models. An α of 0.05 was used to determine statistical significance.

Results

Body Mass Index

The coefficient for change in BMI with change in total MET-minutes as the moderator was not significant (0.14 kg.m² [-0.73 to 1.01], $p = 0.7514$) with a significant residual heterogeneity ($QE_{(8)} = 112.7651$, $p < 0.0001$) and $R^2 = 0.00\%$. The coefficient for change in BMI with change in vigorous minutes as the moderator was significant (0.47 kg.m² [0.18 to 0.76], $p = 0.0013$) with a significant residual heterogeneity ($QE_{(8)} = 32.2139$, $p < 0.0001$) and $R^2 = 63.81\%$. The coefficient for change in BMI with change in moderate minutes as the moderator was not significant (-0.27 kg.m² [-0.91 to 0.36],

$p = 0.3970$) with a significant residual heterogeneity ($QE_{(8)} = 107.2847$, $p < 0.0001$) and $R^2 = 6.15\%$. The coefficient for change in BMI with change in walking minutes as the moderator was not significant (-0.33 kg.m^2 $[-0.80 \text{ to } 1.45]$, $p = 0.5665$) with a significant residual heterogeneity ($QE_{(8)} = 99.2351$, $p < 0.0001$) and $R^2 = 0.00\%$. The coefficient for change in BMI with change in sitting minutes as the moderator was not significant (0.72 kg.m^2 $[-0.25 \text{ to } 1.69]$, $p = 0.1451$) with a significant residual heterogeneity ($QE_{(8)} = 107.2847$, $p < 0.0001$) and $R^2 = 6.15\%$.

Resting Heart Rate

The coefficient for change in RHR with change in total MET-minutes as the moderator was not significant (-2.53 f_c $[-11.66 \text{ to } 6.61]$, $p = 0.5877$) with a significant residual heterogeneity ($QE_{(6)} = 178.4433$, $p < 0.0001$) and $R^2 = 0.00\%$. The coefficient for change in RHR with change in vigorous minutes as the moderator was not significant (2.64 f_c $[-5.32 \text{ to } 10.60]$, $p = 0.5156$) with a significant residual heterogeneity ($QE_{(6)} = 78.9637$, $p < 0.0001$) and $R^2 = 0.00\%$. The coefficient for change in RHR with change in moderate minutes as the moderator was not significant (-5.56 f_c $[-11.85 \text{ to } 0.74]$, $p = 0.0835$) with a significant residual heterogeneity ($QE_{(6)} = 141.1285$, $p < 0.0001$) and $R^2 = 28.42\%$. The coefficient for change in RHR with change in walking minutes as the moderator was not significant (-2.62 f_c $[-13.14 \text{ to } 7.90]$, $p = 0.6250$) with a significant residual heterogeneity ($QE_{(6)} = 116.2823$, $p < 0.0001$) and $R^2 = 0.00\%$. The coefficient for change in RHR with change in sitting minutes as the moderator was not significant (3.50 f_c $[-9.12 \text{ to } 16.11]$, $p = 0.5437$) with a significant residual heterogeneity ($QE_{(6)} = 113.8373$, $p < 0.0001$) and $R^2 = 0.00\%$.

Systolic Blood Pressure

The coefficient for change in SBP with change in total MET-minutes as the moderator was not significant (4.34 mmHg $[-3.22 \text{ to } 11.89]$, $p = 0.2609$) with a significant residual heterogeneity ($QE_{(8)} = 52.9405$, $p < 0.0001$) and $R^2 = 0.00\%$. The coefficient for change in SBP with change in vigorous minutes as the moderator was not significant (3.64 mmHg $[-0.90 \text{ to } 8.17]$, $p = 0.1163$) with a significant residual heterogeneity ($QE_{(8)} = 78.9637$, $p < 0.0001$) and $R^2 = 0.00\%$. The coefficient for change in SBP with change in moderate minutes as the moderator was not significant (0.92 mmHg $[-5.49 \text{ to } 7.32]$, $p =$

0.7789) with a significant residual heterogeneity ($QE_{(8)} = 53.5491$, $p < 0.0001$) and $R^2 = 0.00\%$. The coefficient for change in SBP with change in walking minutes as the moderator was significant (9.84 mmHg [0.68 to 18.99], $p = 0.0352$) with a significant residual heterogeneity ($QE_{(8)} = 46.9710$, $p < 0.0001$) and $R^2 = 17.79\%$. The coefficient for change in SBP with change in sitting minutes as the moderator was significant (8.56 mmHg [0.11 to 17.01], $p = 0.0470$) with a significant residual heterogeneity ($QE_{(8)} = 47.1646$, $p < 0.0001$) and $R^2 = 24.01\%$.

Diastolic Blood Pressure

The coefficient for change in DBP with change in total MET-minutes as the moderator was significant (5.40 mmHg [0.60 to 10.19], $p = 0.0273$) with a significant residual heterogeneity ($QE_{(8)} = 32.0315$, $p < 0.0001$) and $R^2 = 24.46\%$. The coefficient for change in DBP with change in vigorous minutes as the moderator was not significant (1.78 mmHg [-0.80 to 4.36], $p = 0.1771$) with a significant residual heterogeneity ($QE_{(8)} = 41.1938$, $p < 0.0001$) and $R^2 = 0.75\%$. The coefficient for change in DBP with change in moderate minutes as the moderator was not significant (2.49 mmHg [-0.71 to 5.69], $p = 0.1269$) with a significant residual heterogeneity ($QE_{(8)} = 39.1458$, $p < 0.0001$) and $R^2 = 5.15\%$. The coefficient for change in DBP with change in walking minutes as the moderator was not significant (5.79 mmHg [-1.43 to 13.02], $p = 0.1159$) with a significant residual heterogeneity ($QE_{(8)} = 40.6062$, $p < 0.0001$) and $R^2 = 0.00\%$. The coefficient for change in DBP with change in sitting minutes as the moderator was not significant (-1.78 mmHg [-6.94 to 3.38], $p = 0.4988$) with a significant residual heterogeneity ($QE_{(8)} = 38.3524$, $p < 0.0001$) and $R^2 = 0.00\%$.