Physical activity, multimorbidity, and life expectancy

INTRODUCTION

Many people have at least one type of long-term condition, such as diabetes, asthma, cancer, or depression; however, recently people are now living with two or more long-term conditions known as multimorbidity. Managing multimorbidity is a complex problem and has become an emerging priority. Physical activity (PA) is recommended as one of the main lifestyle behaviours, yet the benefits of PA for people with multimorbidity is unclear. We assessed the benefits of PA on life expectancy in people with and without multimorbidity.

METHODS

Using the UK Biobank dataset, we extracted data on 36 chronic conditions and defined multimorbidity as: a) 2 or more conditions; b) 2 or more conditions combined with self-reported overall health; c) 2 or more top-10 most common comorbidities. Leisure-time PA (LTPA) and total PA (TPA) were measured by questionnaire and categorised as low (<600 MET-mins/week), moderate (600 to <3000 MET-mins/week), and high (≥3000 MET-mins/week); while objectively-assessed PA was assessed by wrist-worn accelerometer and categorised as low (4 mins/day), moderate (10 mins/day), and high (22 mins/day) walking at brisk pace. Survival models were applied to calculate adjusted hazard ratios (HRs) and predict life expectancy differences.

RESULTS

491,329 individuals (36,832 with 2 or more conditions) had a median follow-up of 7.0 (IQR 6.3-7.6) years. Compared to low LTPA, for participants with multimorbidity HR for mortality was 0.75 (95% CI: 0.70-0.80) and 0.65 (0.56-0.75) in moderate and high LTPA groups, respectively. This finding was consistent when using TPA measures. Using objective PA, HRs were 0.49 (0.29-0.82) and 0.29 (0.13-0.61) in the moderate and high PA groups, respectively. These findings were similar for participants without multimorbidity.

In participants with multimorbidity, at the age of 45 years moderate and high LTPA were associated with an average of 3.12 (95% CI: 2.53, 3.71) and 3.55 (2.34, 4.77) additional life years, respectively, compared to low LTPA; in participants without multimorbidity, corresponding figures were 1.96 (1.59, 2.31) and 1.85 (1.16, 2.50). Similar results were found with TPA. For objective PA, moderate and high levels were associated with 3.60 (3.60, 7.70) and 5.32 (-0.47, 11.11) life years gained compared to low PA for those with multimorbidity, and 3.69 (1.79, 5.60) and 4.51 (2.15, 6.88) life years gained in those without. Results were consistent when using other definitions of multimorbidity.

CONCLUSION

There was an inverse dose-response association between PA and mortality. A moderate exercise is associated with a longer life expectancy, also in individuals with multimorbidity.