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**PHYSICAL (IN)ACTIVITY AND NETWORK OF CHRONIC DISEASE RISK FACTORS: A TWIN STUDY**

Tuija Leskinen<sup>1,2</sup>, Mirva Rottensteiner<sup>2</sup>, Sari Aaltonen<sup>2,3</sup>, Jaakko Karpio<sup>3</sup>, Ina M Tarkka<sup>2</sup>, Urho M Kujala<sup>2</sup>

<sup>1</sup>University of Turku, Turku, Finland

<sup>2</sup>University of Jyväskylä, Jyväskylä, Finland

<sup>3</sup>University of Helsinki, Helsinki, Finland

Email:tuija.h.leskinen@gmail.com

**Objectives**

The aim of the present twin study (FITFATTWIN) was to investigate the associations between physical activity, fitness, body composition, other cardio-metabolic risk factors and factors related to the central nervous system (CNS) in young adult male twins with different leisure-time physical activity (LTPA) habits.

**Methods**

Participants were 23 monozygotic (MZ) male twin pairs (46 individuals, mean age 35). Ten of the pairs were established to be discordant for LTPA during the past 3 years. A mean sum index for 3-yr LTPA was based on detailed interviews (expressed as MET-hours/day). Fitness ( $VO_{2max}$  by ergospirometry), body fat% (DXA), insulin sensitivity (Matsuda index, calculated from the glucose and insulin values from an oral glucose tolerance test) and CNS-related factors, including determination of psychological exercise motivation were assessed.

**Results**

In all individuals the 3-yr MET-index for LTPA was associated with higher  $VO_{2max}$ , lower body fat%, a higher Matsuda index and greater exercise enjoyment (Figure 1,  $p \leq 0.009$  for all r-values). Also, these variables differed in the pairwise analysis comparing the active members of the discordant twin pairs to their less active co-twins ( $n=10$  pairs;  $p \leq 0.03$  for all comparisons, except for exercise enjoyment  $p=0.06$ ).

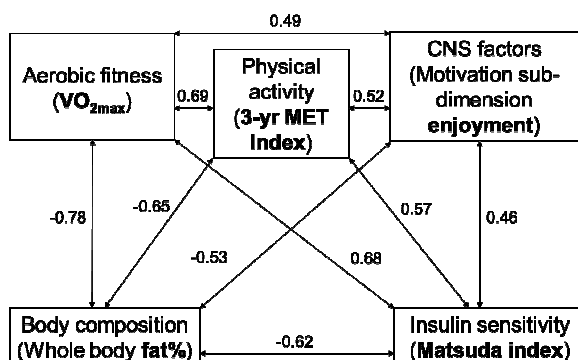


Figure 1. Individual based correlations between the selected variables of physical activity, fitness, body composition, cardio-metabolic risk and CNS-related factors.

**Conclusions**

Our results show that multi-dimensional associations between LTPA habits and risk factors for chronic diseases are already apparent in healthy young adult men. These risk factors also differed between the members of the MZ twin pairs discordant for physical activity, thereby supporting the argument for a causal association between physical activity and risk factor profile.