The relationship between exercise training and cardiovascular risk factors has been investigated extensively in type 2 diabetes; however, less is known about this relationship in persons living with type 1 diabetes (T1D). The aim of this study was to conduct a systematic review and meta-analysis of published clinical randomized, controlled trials on exercise training for cardiovascular risk factors in T1D.

Methods: Electronic databases were systematically searched and key reviews cross-referenced to identify articles for inclusion. Both randomized and non-randomized controlled trials reporting associations for exercise training and cardiovascular risk factors in T1D were included. Weighted mean differences (WMD) of each cardiovascular risk factor between exercise groups and control groups were calculated using a random effect model. Subgroup analyses were performed using the following variables: age, exercise frequency, type of exercise, and program duration to explore sources of heterogeneity. Results: A total of 24 studies reported the effects of exercise training on cardiovascular disease risk factors. Exercise-training increased VO2max and reduced glycated hemoglobin, daily insulin dosage, and total cholesterol. Subgroup analyses showed greater beneficial effects in higher volume (frequency per week and/or duration) exercise interventions. Exercise training did not lead to consistent changes in body mass index, blood pressure, triglycerides, HDL-C, or LDL-C.

Conclusions: In persons living with Type 1 diabetes, aerobic exercise training is associated with a beneficial cardiovascular profile, such as lower total cholesterol, daily insulin dosage and with better glycemic control and aerobic fitness.