



## EXERCISE INTERVENTIONS TO REDUCE THE LEVEL OF HBA1C FOR EFFICIENT AND EFFECTIVE MANAGEMENT OF TYPE 2 DIABETES MELLITUS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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### ABSTRACT

This review study determined the effects of exercise interventions to reduce the level of HbA1c for efficient and effective management of Type 2 Diabetes Mellitus (T2DM). Electronic databases including PubMed, EMBASE and Science Direct were searched for the published literature. Overall effect size with 95% confidence intervals (CIs) was used to assess the strength of the relationship between interventions and T2DM by using a random effects model. Heterogeneity was also evaluated. 10 randomized controlled experimental studies were selected and included in the review. Studies having drug co-interventions were excluded. Overall estimate of the mean differences of the exercise interventions showed that the total effect size for reduction in HbA1c to manage T2DM was about -0.74 with a 95% confidence interval (CI) of -0.98 to -0.50 and the  $I^2$  value is 62%. Exercise interventions are moderately effective in reducing HbA1c to manage type 2 DM efficiently.

**KEYWORDS:** *Type 2 Diabetes Mellitus; HbA1c; Exercise Training; Meta-Analysis*

### 1. INTRODUCTION

Individuals diagnosed as suffering from insulin-resistant diabetes are unable to control their blood sugar levels, since cellular activities in response to insulin gets grossly impaired. Generally, there are three types of diabetes mellitus, type 1 (where body doesn't produce insulin), gestational diabetes (when insulin is less effective during pregnancy and the other one is type 2 diabetes

where insulin is being produced but bodies are not responding, that is, bodies are insulin resistance.<sup>1</sup>

In 2015, 415 million individuals diagnosed with diabetes and this was projected to increase up to 642 million by the end of 2040<sup>1</sup>. Among those individuals, 90% was diagnosed as having type 2 diabetes mellitus or T2DM.<sup>1</sup> Since T2DM is a chronic disease, it may lead to a series of severe complications and comorbidities like blindness, amputation, kidney disease, heart disease etc. Thus,