

RESEARCH PROJECT



The effectiveness of an exercise and lifestyle education program for individuals living with prediabetes or diabetes in Brazil: a multicenter randomized clinical trial

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Summary

This study addresses the challenge of managing diabetes and prediabetes, particularly in Brazil, where the levels of physical activity (PA) remain alarmingly low. Individuals with diabetes often experience a range of health issues, including reduced muscle strength, impaired glucose metabolism, and low PA levels. These factors, compounded by insufficient engagement in regular PA, significantly worsen the health burden faced by those with diabetes. Research shows that PA can improve glycemic control and reduce cardiovascular risks. However, maintaining consistent PA is a persistent challenge in Brazil, where access to resources and support for managing diabetes can be limited.

Patient education is essential in effective diabetes management, providing individuals with the necessary knowledge and tools to make informed decisions about their health. Structured educational programs have been proven to improve behaviors and glycemic control in individuals with diabetes. However, much of the evidence for such programs comes from high-income countries (HICs), and there is a notable gap in understanding their effectiveness in low- and middle-income countries (LMICs) like Brazil, where unique cultural, social, and systemic barriers may impact their success.

To fill this gap, a tailored education program specifically designed for Brazilians with diabetes and prediabetes was developed and pilot-tested. Preliminary findings from a randomized trial suggested that this approach




could potentially improve health outcomes for individuals with diabetes. Additionally, the feasibility of delivering this program remotely was demonstrated, offering a scalable solution to reach more people across Brazil.

Building on these promising results, the present study aimed to investigate the effectiveness of an Exercise and Lifestyle Education (ExLE) program compared to a standard exercise program (Ex) in individuals with prediabetes and diabetes in Brazil. The ExLE program combined an exercise regimen with patient education aimed at improving functional capacity, disease-related knowledge, health literacy, exercise self-efficacy, health behaviors, quality of life, and depression. It was hypothesized that the ExLE program would produce better outcomes than the standard exercise program, providing a comprehensive, pragmatic approach to managing diabetes in an LMIC context.

The study design was a multicenter, double-blind randomized controlled clinical trial, involving two groups: one group participated in the ExLE program, which combined exercise and education, while the other group followed the exercise-only program. The interventions were delivered either on-site or remotely, depending on participants' internet access and technology literacy. The Ex program lasted for 12 weeks and included aerobic sessions (such as walking) along with muscle-strengthening exercises. The ExLE program incorporated these same exercise components, but also added 18 educational sessions using Diabetes College materials tailored to the needs of people living with prediabetes and diabetes in Brazil.

Key outcomes measured in the study included functional capacity (measured by the Incremental Shuttle Walking Test), disease-related knowledge (assessed with the DiAbeTes Education Questionnaire), and secondary outcomes such as health literacy, exercise self-efficacy, physical activity levels, dietary adherence, and medication adherence. The study also evaluated program adherence, quality of life, depression symptoms, and participant satisfaction.

Results showed that both the Ex and ExLE programs led to significant improvements in functional capacity, health literacy, physical activity levels, and adherence to a Mediterranean diet. However, the ExLE program produced significantly greater improvements in disease-related knowledge compared to the exercise-only group. Although both programs improved physical activity and health behaviors, the ExLE group demonstrated superior outcomes in terms of disease-related knowledge.



The study also found that while exercise self-efficacy slightly declined over time, there was no significant difference in overall program adherence between the two groups. Satisfaction with the programs was high among participants, indicating that both exercise and education play a crucial role in managing diabetes effectively.

This study is the first of its kind to assess a combined exercise and education program for diabetes care in Brazil, contributing valuable insights into diabetes management in LMICs. The findings suggest that adding education to exercise programs can enhance disease-related knowledge and improve health outcomes, highlighting the potential value of such comprehensive programs in addressing the unique challenges of diabetes management in settings with limited healthcare resources.



Key words

Diabetes Mellitus; Prediabetes; Health Education; Patient Education; Exercise Training