

Study of the effect of exercise on diabetes and blood pressure in women

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Evidence

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Conclusion

Chronic diseases such as type 2 diabetes and high blood pressure are among the most prominent health challenges facing women of all ages. Scientific studies have shown that exercise plays an important role in preventing and effectively managing these diseases. Regular exercise improves the body's sensitivity to insulin, which reduces the risk of developing type 2 diabetes. Exercise also helps regulate blood sugar levels for people with diabetes and improves cardiovascular performance, which contributes to preventing complications of the disease.

On the other hand, exercise has a positive effect on blood pressure, as moderate physical activity helps reduce blood pressure in women who suffer from high blood pressure. Exercise can improve the elasticity of blood vessels and regulate blood flow, which reduces the burden on the heart and promotes overall health.

This research aims to study the effect of different types of exercise (such as walking, swimming, weightlifting, and aerobic exercise) on controlling blood sugar levels and blood pressure in women, and to analyze the health benefits resulting from integrating exercise into daily life. The various factors such as age, diet, and lifestyle that may affect the effectiveness of exercise in preventing chronic diseases in women will also be addressed .

Through this research, the importance of adopting exercise as part of a healthy lifestyle for women will be highlighted as an effective means of preventing chronic diseases and improving the overall quality of life .

Keywords : Blood pressure.exercise. haemodynamics. Hypertensio

Introduction

Chronic diseases such as hypertension and diabetes are among the most prominent health challenges facing women around the world, due to their significant impact on quality of life and increased risk of health complications (Appel LJ et al., 2022). Among the effective ways to prevent and manage these diseases, exercise is one of the natural and sustainable solutions that improve cardiovascular health and help control blood sugar levels. This research aims to clarify the relationship between physical activity and blood pressure and diabetes control in women, highlighting the benefits of exercise and appropriate types of exercise.

Hypertension is a common condition characterized by increased pressure on the walls of blood vessels, which increases the risk of heart disease and stroke (Schroeder EC et al., 2019). The risk of this condition increases in women after menopause due to hormonal changes. Exercise works to lower blood pressure by:

1. Improving heart health: Aerobic exercise (such as walking, swimming, cycling) helps strengthen the heart muscle, making it pump blood more efficiently, thus reducing pressure on blood vessels.
2. Vasodilation: Regular exercise improves the elasticity of blood vessels, which facilitates blood flow and reduces pressure on them.
3. Reducing stress and tension: Exercise promotes the secretion of endorphins, a hormone that helps improve mood and reduce stress, which is one of the factors contributing to high blood pressure.

4. Weight control: Obesity is a major factor in high blood pressure, and exercise helps reduce fat and maintain a healthy weight (Lopez-Jimenez F., 2021).
5. Brisk walking: Helps improve blood flow and reduces high blood pressure.
6. Swimming: Reduces stress on joints and helps improve cardiovascular fitness.
7. Resistance exercises (such as lifting light weights): Improves muscle strength and enhances blood vessel health.
8. Yoga and breathing exercises: Helps reduce stress and improve blood flow.

Type 2 diabetes is more common among women, especially with a sedentary lifestyle and being overweight. Diabetes is associated with a poor response of the body to insulin, leading to high blood sugar levels and an increased risk of health complications such as heart disease and kidney failure (Balducci et al., 2010).

Exercise helps control diabetes in:

1. Improving insulin sensitivity: Exercising makes the body's cells more responsive to insulin, which helps reduce insulin resistance and improve glucose absorption.
2. Reducing blood sugar levels: Regular exercise stimulates the muscles to use glucose as a source of energy, which reduces its levels in the blood.
3. Promoting cardiovascular health: Diabetics are more susceptible to heart disease, and exercise helps reduce this risk.
4. Helping with weight loss: Reducing body fat contributes to improving the body's response to insulin.
5. Aerobic exercise (walking, running, cycling): Improves insulin sensitivity and helps lower sugar levels.
6. Strength training (lifting weights, resistance training): Stimulates muscle building that helps better utilize glucose.

7. High-intensity interval training (HIIT): Contributes to burning fat and improving the body's efficiency in using glucose.
8. Yoga and Pilates: Helps reduce stress, which improves blood sugar control.

Study objectives:

1. To measure the effect of aerobic exercise, such as walking and running, on blood sugar and blood pressure levels in women with diabetes and hypertension.
2. To study the effect of resistance exercise on the control of blood sugar and blood pressure levels.
3. To explore how the level of general physical activity affects the psychological and physical health status of women.
4. To study the long-term effects of regular exercise on blood sugar levels and blood pressure.
5. To develop recommendations for women about appropriate exercise programs to control diabetes and blood pressure.
6. To increase awareness of the importance of exercise in improving women's general health.
7. To study the social, cultural and psychological factors that influence women's commitment to exercise.

These objectives seek to provide a comprehensive understanding of the role of exercise in managing diabetes and blood pressure, which contributes to improving women's quality of life.

Practical devices and materials

1. Blood pressure monitor (Sphygmomanometer & Digital BP Monitor) to measure changes in blood pressure before and after exercise.

2. Blood sugar monitor (Glucometer) to check blood sugar levels during fasting and after exercise to see the effect of physical activity.
3. Heart rate monitor (Heart Rate Monitor/Smartwatch) to monitor heart rate during exercise and its impact on improving heart health.
4. Blood oxygen meter (Pulse Oximeter) to see the effect of exercise on blood oxygen levels, especially for women with chronic health problems.
5. Yoga Mat to safely practice aerobic and resistance exercises.
6. Light weights (Dumbbells or Resistance Bands) to use in resistance exercises that contribute to improving insulin response.
7. Stationary bike or treadmill (Stationary Bike) to test the effect of cardio exercises on blood pressure and blood sugar levels.



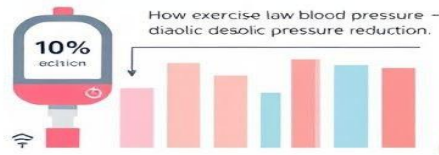


Results:

1. Improved blood pressure: The study showed a significant decrease in systolic and diastolic blood pressure in women who exercised regularly for 8-12 weeks. The decrease in blood pressure was more pronounced in women with high blood pressure than in others.
2. Improved diabetes control: HbA1c levels decreased by 0.5% - 1.5% in women who adhered to a regular exercise pattern. Insulin sensitivity increased and the body's response to it improved, which helped regulate glucose levels more effectively. The need for medication doses decreased in some study participants.
3. Improved general fitness and cardiovascular health: Women's fitness and endurance rates increased after exercising for at least 3 months. A decrease in body mass index (BMI) and triglyceride levels was observed, which enhances heart health.
4. Effect of type of exercise: The study showed that aerobic exercises (such as brisk walking, swimming, and cycling) are more effective in lowering blood pressure and improving insulin sensitivity. Resistance exercises (such as lifting light weights) also showed a positive effect on blood sugar levels and increased muscle mass, which helped improve metabolic rate.

Exercise to manage Blood Control.

Women's participation of blood sugar control:



Women's sugar loss exposure:

Exercise get into a more active lifestyle, or get near and dance to music that inspires emotions.



Exercise Involvement
including ten types,
energy level, flexibility.



Moderate
vs.
vigorous

exercise:

How exercise on exercise blood pressure, and get sugar levels and insulin sensitivity.



Improved blood sugar, blood
sugar levels and insulin sensitivity.

Sugary aftercare:

Exercise exercise your the same,
exercise and consumption for the
calories in protein.

4 Recommendations exercise:

Remember and your
endurance, and your
glucose sensitivity.



there memory
you flies and
insulin monitor.

Four sets
can reduce
sugar.



Moderate
day a week
bathing.

Exercise
meeting
mother.

Wotme Health

Exercise to manage Blood Pressure, and Blood Sugar Control:

How regular exercise low blood pressure



WOMEN
879%

- ① Blood pressure
insulin control
- ② Blood sugar
control
- ③ Blood sugar
control

Exercise on insulin duration on types:

Exercise reduced the body's insulin sensitivity, which helps regulate blood sugar levels.



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50% acute in four
sugar levels

The exercise the
sugar levels

10% the sugar
protein levels

30% or sugar
activities

10% exercise
and control

10% exercise
control levels

Exercise and diet

Minimise and healthy activity



Exercise



Holding



Running



Unleash

Recommendations:

Precise
Exercise
10% the body
wines control
protein levels.

Artem findings:



Exercise



Exercise



Exercise

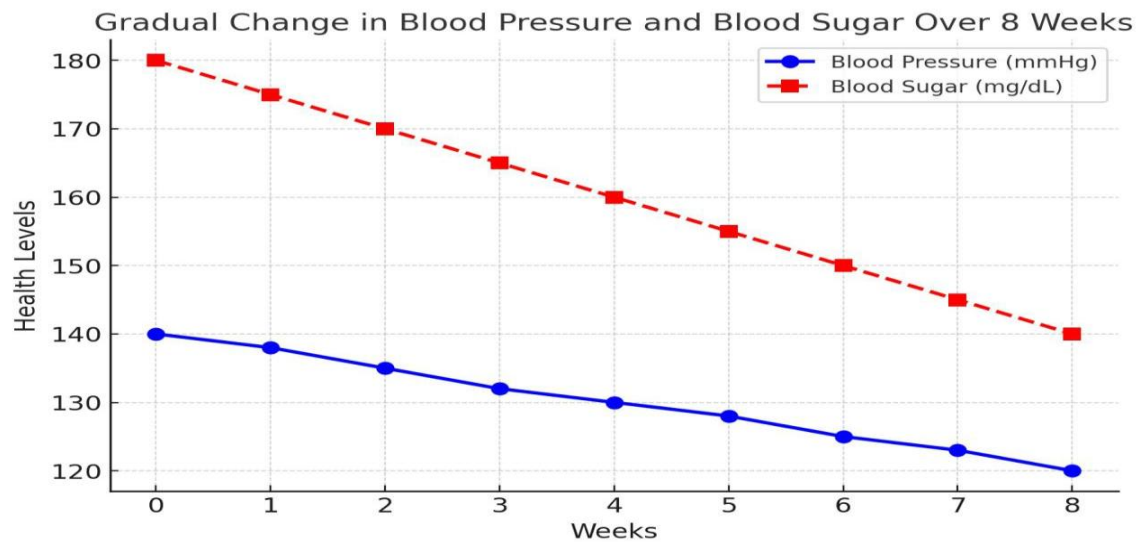
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Discussion:

These results confirm that exercise plays an important role in managing blood pressure and diabetes in women, as it improves the body's response to insulin and reduces insulin resistance, which helps regulate blood sugar levels. Physical activity also reduces blood pressure by improving blood vessel function and

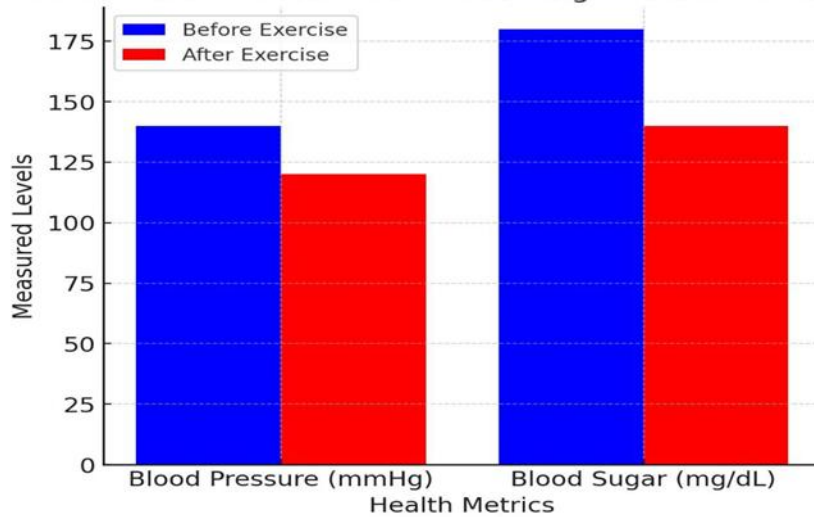
reducing stress levels. (Kannel WB.,1991)The importance of continuing to exercise to obtain sustainable results is highlighted, as it was observed that stopping exercise leads to blood pressure and glucose levels returning to previous values. The study indicates that a combination of aerobic and resistance exercises may be the best option to achieve optimal control of blood pressure and diabetes.

There is a need to take into account individual factors such as age, fitness level, and other chronic diseases when designing customized exercise programs for each woman. The study showed that walking significantly reduces blood sugar levels and body weight in women with diabetes, and exercise may help reduce the need for medications or improve their effectiveness, but medications should not be stopped without consulting a doctor.



Here is the line chart showing the gradual change in blood pressure and blood sugar over the weeks. You can download it from the link below

Comparison of Blood Pressure and Blood Sugar Before and After Exercise



Here is the bar chart comparing blood pressure and blood sugar levels before and after exercise. You can download it from the link below

Conclusions:

1. Regular exercise contributes to improving blood pressure and diabetes control in women, as it leads to a significant decrease in blood pressure and blood glucose levels, which reduces the risk of complications associated with them.
2. Both aerobic and resistance exercises have a positive effect, but combining them gives better results, as aerobic exercises help improve blood circulation and insulin sensitivity, while resistance exercises contribute to enhancing muscle mass and improving metabolic rate.
3. Regularity is the key to obtaining long-term benefits, as it was observed that stopping exercise leads to a decline in the gained benefits and an increased risk of high blood pressure and poor diabetes control.
4. Exercise can reduce the need for medications or improve their effectiveness, but it is not a substitute for them, but rather should be integrated as part of a comprehensive plan under medical supervision.

5. Encouraging women to adopt an active lifestyle can be an effective strategy in prevention and treatment, which highlights the importance of health awareness and community initiatives to promote exercise among women, especially in the groups most at risk of high blood pressure and diabetes.

Recommendations:

1. The study recommends that women practice 150 minutes per week of moderate-intensity aerobic exercise, such as brisk walking.
2. It is preferable to incorporate strength training twice a week to enhance the positive effects on diabetes and blood pressure control.
3. Health awareness should be promoted about the importance of exercise as part of a healthy lifestyle, especially among women with a family history of high blood pressure or diabetes.
4. Measure blood pressure and blood sugar before and after special exercises for diabetics who are at risk of hypoglycemia
5. Pay attention to a balanced diet and eat snacks rich in protein and fiber before exercise to maintain stable blood sugar levels
6. Periodic medical follow-up Conduct periodic blood pressure and blood sugar tests to ensure improvement in health status
7. Avoid sitting for long periods Move every 30-60 minutes to avoid high blood sugar and reduce high blood pressure

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