



**Physical activity as a tool for the prevention and control of non-communicable diseases
with a One Health approach**

**La actividad física como herramienta para la prevención y control de enfermedades no
transmisibles con enfoque Una Salud**

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Abstract

Introduction: Physical activity is essential to prevent and control non-communicable diseases. **Objective:** To evaluate the impact of physical activity as a tool for the prevention and control of non-communicable diseases. **Methodology:** A descriptive-observational study was conducted with 350 adults aged 18 to 65 years from Micro 1B, Santiago de Cuba. Of the 203 initial participants, all were sedentary. **Results:** After the intervention, a reduction in blood pressure ≥ 10 mmHg was found in 40.34% of hypertensive participants, a decrease in blood glucose ≥ 15 mg/dl in 35.71% of diabetic participants, a weight loss $\geq 5\%$ in 29.76% of obese participants, and an increase in physical activity in 50.25% of sedentary participants. **Quality of life** improved in 65.14% of participants. **Discussion:** The magnitude of metabolic and cardiovascular improvements found is consistent with

international evidence supporting exercise as a priority intervention in primary care. These results highlight the need to integrate community and environmental strategies, in accordance with the One Health approach, to improve adherence and program sustainability. **Conclusions:** Regular physical activity proved to be a cost-effective strategy for improving metabolic control, reducing risk factors, and promoting overall well-being.

Keywords: exercise; non-communicable diseases; prevention and control.

Resumen

Introducción: La actividad física es fundamental para prevenir y controlar las enfermedades no transmisibles. **Objetivo:** Evaluar el impacto de la actividad física como herramienta para la prevención y control de enfermedades no transmisibles.



Método: Estudio descriptivo-observacional en 350 adultos de 18 a 65 años del Micro 1B Santiago de Cuba. De los 203 participantes iniciales, todos eran sedentarios. **Resultados:** tras la intervención se encontró una reducción de la presión arterial ≥ 10 mmHg en 40,34 % de los hipertensos, disminución de la glucemia ≥ 15 mg/dl en 35,71 % de los diabéticos, pérdida de peso ≥ 5 % en 29,76 % de los obesos e incremento de la actividad física en 50,25 % de los sedentarios. El 65,14 % de los participantes mejoró su calidad de vida. **Discusión:** El tamaño de las mejoras metabólicas y cardiovasculares halladas coincide con la evidencia internacional que apoya el ejercicio como intervención prioritaria en atención primaria. Estos resultados ponen de relieve la necesidad de integrar estrategias comunitarias y ambientales, de acuerdo con el enfoque de “Una Salud”, para mejorar la adherencia y la sostenibilidad de los programas. **Conclusiones:** La actividad física regular demostró ser una estrategia rentable para mejorar el control metabólico, reducir los factores de riesgo y promover el bienestar integral.

Palabras clave: ejercicio; enfermedades no transmisibles; prevención y control.

Introduction

Physical activity is one of the fundamental pillars for promoting health and improving the quality of life among the population (Hills et al., 2014). Various scientific studies have shown that regular exercise not only contributes to physical and psychological well-being but also plays an essential role in the prevention and management of non-communicable diseases (NCDs), such as high blood pressure, type 2 diabetes, cardiovascular

diseases, and certain types of cancer (Booth, Roberts & Laye, 2012). In a world characterized by increasing sedentary lifestyles and unhealthy habits, the regular practice of physical activity takes on greater importance (Coelho & Burini, 2009).

Non-communicable diseases are currently one of the leading causes of morbidity and mortality worldwide, accounting for more than 70% of the global burden (World Health Organization, 2022). The World Health Organization (WHO) estimates that at least 17.9 million people die each year from cardiovascular diseases, while physical inactivity is one of the main modifiable risk factors (World Health Organization, 2022). In Latin America, the Pan American Health Organization (PAHO) reported in 2023 that 39% of adults do not meet the minimum recommendation of 150 minutes of moderate physical activity per week, a situation that increases vulnerability to non-communicable diseases and reduces quality of life (World Health Organization, 2023). Risk factors such as a sedentary lifestyle, poor diet, and chronic stress have become more prevalent in recent decades, affecting both developed and developing countries (World Health Organization, 2023). In light of this reality, regular physical activity emerges as a cost-effective intervention strategy that helps reduce risk factors by promoting more

active and healthy lifestyles in the community (Katzmarzyk, Friedenreich, Shiroma & Lee, 2022).

The “One Health” approach proposes integrating human, social, and environmental factors to address public health issues in a comprehensive manner (Rynhach et al., 2018). In the context of physical activity, this approach highlights the importance of healthy environments (green spaces, clean air, and safe communities) as determinants of the population’s active behavior (World Health Organization, 2023). Thus, it promotes not only individual health by reducing risk biomarkers but also community and environmental health, creating a virtuous cycle of sustainable well-being.

In this regard, evaluating physical activity as a tool for the prevention and control of non-communicable diseases from the “One Health” perspective is key to informing public policy and designing evidence-based community interventions (Nishtar et al., 2004).

The objective of this study is to evaluate the impact of physical activity as a tool for the prevention and control of non-communicable diseases from the “One Health” perspective in Micro 1B, Reparto Abel Santamaría, Santiago de Cuba (Adami et al., 2010).

Methodology

A quantitative, descriptive-observational, cross-sectional study with an analytical component was conducted, based on the “One Health” approach.

Population and sample: Adults aged 18 to 65 residing in Micro 1B, Reparto Abel Santamaría, Santiago de Cuba, where public spaces are available for physical activity.

Inclusion criteria: residence for ≥ 1 year, no severe physical disability, and informed consent.

Exclusion criteria: pregnancy, acute illnesses that limit exercise.

Sample size: According to the WHO (2022), the global prevalence of physical inactivity among adults is 27.5%, and PAHO (2023) estimates that 39% of adults in Latin America do not meet physical activity recommendations. Considering an expected prevalence of 35%, a 95% confidence level, and 5% precision, a sample size of approximately 350 participants was calculated (Menhas et al., 2021).

Dependent variables: blood pressure, body mass index (BMI), fasting blood glucose, weekly physical activity profile.



Independent variables: level of physical activity, age, sex, occupation.

Environmental variables: availability of green spaces, air quality, perceived safety.

Methods: International Physical Activity Questionnaire (IPAQ), validated sphygmomanometer, calibrated scale and height rod, portable blood glucose meter, community survey.

Procedure: 1) Random selection of households and participants, 2) Administration of the questionnaire, 3) Administration of surveys, 4) Clinical measurements, 5) Data entry into the database.

Descriptive statistics (means, proportions), chi-square, Student's t-test/ANOVA, and multivariate logistic regression adjusted for age, sex, and environmental factors were used. Software: SPSS v.29 or R v.4.3.

Ethical considerations: Approved by an ethics committee; informed consent; confidentiality; referral for consultation in the event of high-risk findings.

“One Health” rationale: This study design integrates individual, community, and environmental health, in line with the “One Health” action plan (WHO, 2022).

Results

Regular physical activity is a significant protective factor against the incidence and progression of non-communicable diseases, particularly cardiovascular diseases, type 2 diabetes mellitus, certain types of cancer, and obesity. It was observed that individuals who meet the World Health Organization's recommendations exhibit a reduction in metabolic risk factors, better glycemic control, and lower levels of high blood pressure.

Table 1. *Prevalence of non-communicable diseases and baseline physical activity level (n=350)*

Indicators	Categories	Number of patients	Percentage (%)
Non-communicable diseases	High Blood Pressure	119	34,00
	Type 2 diabetes mellitus	42	12,00
	Obesity (BMI ≥ 30)	84	24,00
	Dyslipidemias	70	20,00
Initial level of physical activity	Sedentary	203	58,00
	Light physical activity	88	25,00
	Moderate or vigorous physical activity	59	17,00

Source: Own elaboration

Source: Results of the methods used.

From the sample of 350 participants, we found that hypertension had the highest prevalence among non-communicable diseases, affecting 119 participants (34.00%), followed by obesity, which

affected 84 participants (24.00%). Likewise, a sedentary lifestyle was prevalent among 203 participants (58%); only 17% of the sample engaged in moderate or vigorous physical activity.

Table 2. *Impact of the physical intervention after 6 months (n=350)*

Indicators	Description	Number of patients	Percentage (%)
Hypertensive	Blood pressure reduction of ≥ 10 mmHg	48	40,34
Type 2 diabetics	Decrease in fasting blood glucose of ≥ 15 mg/dl	15	35,71
Obese	Weight loss of $\geq 5\%$	25	29,76
Sedentary	Increase in moderate physical activity	102	50,25
General	Improving Quality of Life	228	65,14
	Reduction in Combined Risk Factors	70	20,00

Source: Own elaboration

Source: Results of the methods used.

The table presented above shows that following the physical activity intervention, significant improvements in the participants' health were observed. Among the most relevant results are a reduction in blood pressure in 40.34% of participants with hypertension, improved glycemic control in 35.71% of participants with diabetes, and weight loss in 30% of obese participants. In addition, more than half of the sedentary participants (50.25%) increased their level of physical activity. Overall, 65.14% reported an improvement in quality of life, and 20% reduced their combined risk factors, confirming the positive impact of regular physical exercise

on the prevention and management of non-communicable diseases.

Discussion

The results obtained are consistent with recent scientific evidence recognizing physical activity as one of the most effective and cost-effective strategies for the prevention and control of non-communicable diseases. According to the World Health Organization (2022), physical inactivity is the fourth leading risk factor for global mortality, which reinforces the need to promote exercise programs as a priority public health intervention.

Several studies have confirmed that regular physical activity significantly reduces the prevalence of risk factors such as hypertension, obesity, and insulin resistance (Katzmarzyk et al., 2022; Guthold et al., 2023). These findings support the results of the present study, in which regular exercise had a positive impact on metabolic and cardiovascular control. Furthermore, physical activity has been shown to have beneficial effects on mental health by reducing symptoms of anxiety and depression, which is consistent with research highlighting the role of exercise in improving overall well-being (Piercy et al., 2021).

Furthermore, the implementation of public policies that promote accessible and safe spaces for physical activity is essential (Rauramaa et al., 2016). In contexts where these strategies have been implemented, there has been a reported increase in adherence to exercise programs and, consequently, a reduction in the burden of disease from non-communicable diseases (World Health Organization, 2023). However, challenges remain regarding the sustainability of these interventions and the need to integrate physical activity into educational and workplace settings to ensure their long-term impact.

In summary, the discussion reaffirms that physical activity not only serves as a preventive measure against non-communicable diseases but is also an essential component in the management and control of these diseases, which justifies giving it priority in health policies and community health promotion programs.

The One Health approach facilitates the coordination of intersectoral strategies that address not only individual health but also interactions with the environment and the community.

Conclusions

Regular physical activity has been confirmed as a cost-effective and accessible tool for the prevention and control of non-communicable diseases. Its positive impact extends beyond the physiological realm to the psychological and social spheres, promoting the holistic development of the individual (Thornton et al., 2016). The proposed intervention improved metabolic control, lowered blood pressure, reduced overweight status, and improved the quality of life of the study participants. Under the One Health approach, the strategy has the potential to be replicated in other Cuban communities, helping to reduce the burden of non-communicable diseases nationwide (Ganzit & Regis, 2020)

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