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PUBLIC HEALTH

POSTER PRESENTATION

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PREVENTION (NONPHARMACOLOGICAL)

Integrating city design into lifestyle trials: urban greenness shapes physical activity levels across 12 cities in the LatAm FINGERS trial

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Abstract

Background: LatAm FINGERS is a feasibility trial aimed at preventing cognitive decline in individuals at risk through lifestyle changes in Latin America, with its objectives aligned with the RE-AIM (Reach, Effectiveness, Adoption and Implementation) framework. An essential component of this framework is adoption, which emerges from the interaction between participants, the trial procedures, and their environment. Given that the intervention focuses on lifestyle modifications, it is crucial to consider an often-overlooked factor: the city where participants live and its influence on behavior. A clear example is the relationship between physical activity and the availability of spaces that support it. Urban greenness refers to the collection of green spaces within a city. We aimed to examine how accessibility to green spaces influences the amount of physical activity performed by participants before starting the LatAm-FINGERS trial.

Method: We geolocated the residences of 1,800 screened individuals from 12 Latin American cities. Using publicly available data, we estimated isochrones, or areas reachable within a 15-minute walk (3.4 km/h), along city pathways. As a measure of greenness, we calculated the surface area of public green spaces within each isochrone and the distance to the nearest green space. Physical activity was assessed using the International Physical Activity Questionnaire (IPAQ) and converted into metabolic equivalent of task (MET) units. A generalized linear mixed-effects model assessed

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whether weekly physical activity levels (in METs/week) were associated with walkable green space availability. The model was adjusted for socioeconomic status, education, sex, mobility assistance needs, depression, smoking, and co-morbid conditions.

Result: Walking was the most common physical activity, with weekly METs averaging 126.5 (SD=108.4), representing 70.2% (SD=10.8%) of total physical activity. While the total green space area had a minimal effect on walking (β=−0.0004, 95%CI=-0.0017, 0.0001), distance to the nearest green space influenced walking levels (β=-0.0440, 95%CI=-0.1874, 0.0982). For each block farther a participant's home was from a green space, weekly walking METs decreased by 3%.

Conclusion: These results highlight the importance of green spaces in promoting physical activity. Future steps will explore whether urban greenness also influences intervention adherence to the physical activity program and other measures of wellbeing.

Figure 1. Cities and Isochrones. On the left, the locations of the 12 cities studied. On the right, the isochrones of participants in a specific city of the study (Buenos Aires). Above and to the right, the references along the borders of an isochrone show the patient's home location and the estimation of the nearest green space.

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Demographic features	[1]
Age	68.0 (5.0)
Sex (% female)	77%
Education(years)	13.5 (3.3)
Physical activity (METs /week)	230 (180)
Walk (METs/week)	126 (108)
Comorbilities*	
Use of walking aids (%)	19%
Smoke	62%
Depression	1.5%
Cardiac illnes history	10%
Pulmonary disease history	5.8%
Osteoarticular disease history	43%

[1] Mean (SD); %

*Participants were classified as having a cardiac history if they reported any of the following conditions: myocardial infarction, heart failure, arrhythmia, angina, previous cardiac surgery, or participation in a cardiac rehabilitation program. Participants were classified as having a pulmonary disease history if they had experienced a thrombotic event, been diagnosed with an obstructive pulmonary disease, or required oxygen therapy. Lastly, participants were classified as having an osteoarticular disease history if they had been diagnosed with osteoarthritis or rheumatoid arthritis, experienced a hip fracture, undergone joint replacement or spinal surgery, or were receiving physical therapy.

Table 1. Demographic features

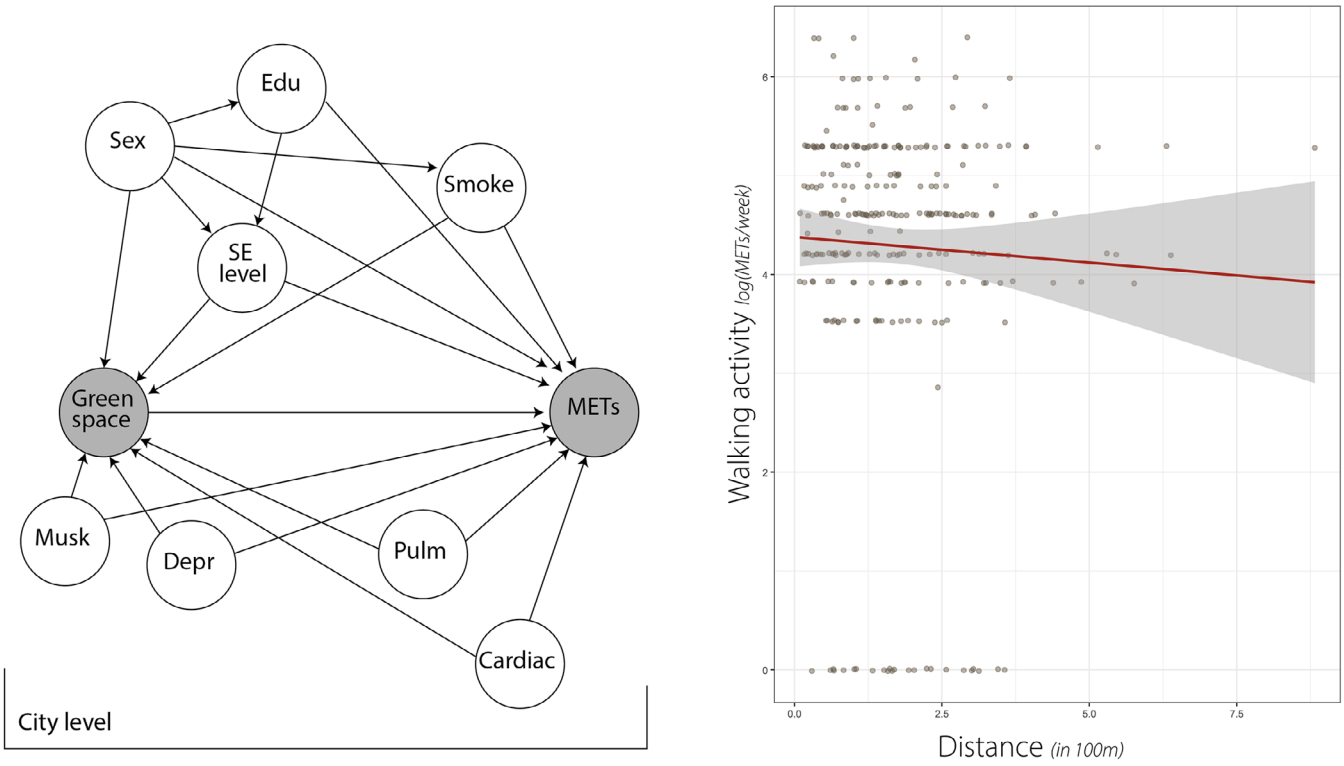

Figure 2. On the left, a directed acyclic graph (DAG) outlining the model evaluated. On the right, walking physical activity in log(METs/week) as a function of the distance to the nearest park.