

Study of the Effects of Urban Morphology on Physical Activity

Olta Braçe

Universidad Politécnica de Tirana

oltabrace@msn.com

Keywords: Urban form, urban sprawl, lifestyle, physical activity, health

A large number of studies, performed primarily in Anglo-Saxon countries and Northern Europe, have evaluated the possible associations between urban morphology and physical activity related to displacement (that is, walking and cycling as opposed to the use of private vehicles). These studies have shown that low-density urban areas with segregated land uses, poor proximity to services, insufficient public transport and low quality public spaces reduce the probability of displacement related to physical activity (walking and cycling) and increase dependence on private vehicles.

Variables to be addressed when analyzing choice of transport include distance, speed, cost and convenience. Characteristics such as density, accessibility, mixed land uses and street connectivity are also factors to consider when analyzing modes of transport related to physical activity.

In Europe, a combination of mobility policies and urban design, including increased education, more space for pedestrians and cyclists, and the promotion of non-motorized transport, have resulted in a substantial reduction of automobile traffic in cities. Incorporation of these types of design and urban policy measures promote walking and bicycle use.

Among the factors that encourage the use of bicycles are accessibility, connectivity and the proximity of the residence to cycle paths. Likewise, the presence of public transport and its easy accessibility play an important role in the realization of physical activity. Studies have shown that in neighborhoods with better public transport and cycle paths people are more physically active and have lower levels of overweight and obesity.

The aim of this paper is to determine whether, as it has been found in studies conducted in northern Europe and Anglo-Saxon countries, urban morphology influences the practice of physical activity. This study was done in the municipality of Mairena del Aljarafe (Seville).



To begin, an extensive review of published papers on this subject in scientific journals, books and reports was conducted. These studies demonstrate how urban characteristics influence the performance of physical activity and the use of non-motorized modes of transport.

As to the study area, the territory of Mairena del Aljarafe was zoned into 13 more or less homogeneous areas with populations of 2,000-9,000 inhabitants. The study took into account the predominantly urban model (compact or sprawl), the type of housing (blocks of flats, semidetached or villas), the presence or absence of services and the type of urban landscape

To collect data for this study, a population survey about the lifestyles and physical activities of the inhabitants was conducted. The questionnaire designed for this purpose was composed of items organized into large thematic blocks: sociodemographic characteristics, lifestyles, mobility and health.

In total, we interviewed 505 individuals ranging from 16 to 64 years of age. The respondents, stratified by age and gender, formed a fairly representative sample of the total population of the municipality, estimated at 44,582 according to the 2014 Spanish Census (confidence interval > 95%). The sample was selected from the database of the Municipal Census using the "random" function of Excel software to assure that similar proportions of individuals to be surveyed were randomly selected from each zone.

The data obtained from the survey were analyzed statistically using SPSS 21. The independent variable was urban sprawl, and the dependent variables were the physical activities, walking and cycling.

The results from the survey in the municipality of Mairena del Aljarafe showed that only 1.1% of the population living in areas with high sprawl used non-motorized transport (walking or cycling), compared to 10.6% of individuals residing in areas with low sprawl.

Regarding physical activity, 27.9% of the total population did not perform any type of physical activity, apparently because the population is strongly linked to the city of Seville and highly dependent on private vehicles. Among all physical activities, walking was the most common (37.8% of respondents), followed by running (10.1% of respondents). The populations living in more compact areas walked more than the populations of more scattered areas, demonstrating the influence of urban morphology on physical activity.

Concerning the use of transport modes related to physical activity, the results showed that 90.6% of respondents residing in areas with high sprawl used motorized modes of



transport compared to 71.7% of people living in areas with lower sprawl. Conversely, 19.3% of those living in areas of lower sprawl used modes of non-motorized transport compared to only 6.3% of those living in areas of high sprawl. Regarding public transport, 9.1% of people residing in areas of low sprawl used these modes compared to only 3.1% of people residing in areas of high sprawl.

The study also showed that the urban sprawl phenomenon has impacted spatial distribution and accessibility of services and equipment. Indeed, it was observed that in areas with more sprawl there is a lower presence of services and facilities, forcing a greater use of private vehicles to perform daily life activities.

In conclusion we can say that walking as a mode of transport is highly influenced by urban variables such as population and development densities, the presence of mixed uses, the design of roads or sidewalks, lighting, age of the neighborhood, and proximity or accessibility of services. Likewise, the existence of and accessibility to bicycle paths is directly related to the use of bicycles. The quality of the urban environment, higher densities and mixed land uses allow greater accessibility and increased use of transport-related physical activity.

In this paper we have analyzed the association between urban morphology and physical activity, and have demonstrated that results from a study in Mediterranean Europe using the municipality of Mairena del Aljarafe are consistent with results in the scientific literature obtained mainly from Anglo-Saxon countries and northern Europe. All of the evidence indicates that the more densely populated an area, the more services in that area and the greater the proximity to those services, and the higher the density of development or older housing in the area, the greater the probability of walking or cycling and, therefore, daily physical activity.

These results should serve to enable planners and managers to take steps to prevent the progressive increase in urban sprawl and to promote mixed use and building core areas based on proximity to services, facilities and places of work. This should serve to reduce the average distances involved in overall movement, facilitate the use of transport-related physical activity and limit the use of private vehicles as the main or even only mode of transport. This should have a significant positive impact on sustainable development from an environmental, economic and social point of view.

