Factors associated with low levels of physical activity among elderly residents in a small urban area in the interior of the Brazilian Amazon

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ARTICLE INFO

ABSTRACT

The aim of the present study was to investigate levels of physical activity and risk factors for inactivity in older adults living in an urban area in the interior of the Amazonas state, Brazil. Data were collected between 2013 and 2015 from 274 individuals 60 years of age or older who resided in the interior of the Brazilian Amazon. Sociodemographic, general health, functional capacity and physical performance were associated with self-referred physical activity level. A multivariate analysis, after adjustment, showed that being a man, having a body mass index above 27 kg/m^2, never having lived in riverside communities and having less than three associated chronic diseases were independent risk factors for low levels of physical activity among elderly residing in the interior of the Brazilian Amazon. Few studies have been conducted about the characteristics that are singular to this population. Our results suggest that the physical activity level and, consequently, the aging process of the elderly is influenced by where they have resided throughout their lives. Additionally, the results showed particular risk factors associated with low physical activity level among older adults residing in the interior of the state of Amazonas.

1. Introduction

Population aging is a worldwide phenomenon characterized by an increasing number of people over 60 years of age. Because of decreases in fertility rates, demographic projections predict that the average growth of the elderly will increase from 9% in 2010 to 16% in 2050 (Shetty, 2012). Considering forecasts for developing countries, it is expected that one in four people will be 60 years old in 2050, which means that 80% of the projected worldwide elderly population of 2 million for this year will be living in those nations (Shetty, 2012; Shrestha, 2000). In Brazil, the population aged 60 years and older, which was 19.6 million in 2010, should reach approximately 41.5 million in 2030; the average growth for the next 10 years is projected to be more than one million per year (Ervatti, Borges, & Jardim, 2015). However, this increase in life expectancy does not necessarily reflect better health and quality of life (Rechel et al., 2013). The incidence of disabilities and morbidities is strongly linked to aging (Marengoni, Rizzuto, Wang, Winblad & Fratiglioni, 2009; Srauss, Fratiglioni, Viitanen, Forsell & Winblad, 2000), although prevention of disabilities in old age can be achieved by lifelong healthy lifestyles and behaviors (Chakravarty et al., 2012).

The maintenance of a lifelong active lifestyle may contribute to better physical capabilities in old age because of adaptations in various body systems, which translates into better motor skills, better distribution of oxygen and nutrients to cells, and improvement in metabolic processes, particularly glucose regulation (McPhee et al., 2016). Furthermore, studies have linked the healthy aging (Hamer, Lavoie, & Bacon, 2014; Sun, Norman, & While, 2013) and longevity (Stessman, Hammerman-Rozenberg, Cohen, Ein-Mor & acobs, 2009) with active lifestyle of midlife individuals and aged 60 years and older. The World Health Organization (World Health Organization, 2007) has recommended incentives for the practice of physical activities among the elderly population to prevent loss of functional capacity. The benefits described include the prevention and management of certain chronic diseases and falls, greater independence for activities and self-care, improved self-esteem, better quality of life, better life expectancy, and

reduction in mortality (World Health Organization, 2005).

Regarding place of residence, studies have found differences between people living in rural areas and those living in urban areas in several aspects (Eberhardt & Pamuk, 2004; Rabiner, Konrad, & DeFriese, 1997). Differences related to place of residence at the overall health level have been associated with factors such as demographic and socioeconomic characteristics, lifestyle, health hazards, and access to health care and services (Eberhardt & Pamuk, 2004; Wu, Yue, & Mao, 2015). Although few studies have been conducted in rural areas, particularly in Latin American nations, some health issues seem to be negatively influenced by this place of residence. Studies have shown that the rural population shows higher incidence of functional disabilities (Zimmer, Wen, & Kaneda, 2010), high fear of falling down (Cho et al., 2013), higher morbidity, and prevalence of chronic non-communicable diseases (Sjölund, Nordberg, Wimo & Von Strauss, 2010; Velásquez-Meléndez, Gazzinelli, & Côrrea-Oliveira, 2007). On the other hand, the literature also includes studies describing the positive effects of living in non-metropolitan regions on performance of functional tasks and self-care activities, regardless of the functional level (Lim & Taylor, 2005; Rabiner et al., 1997).

Studies about levels of physical activity in rural populations have shown conflicting conclusions when compared to elders who live in urban regions. The rural population has been shown both to be more active (Padrão, Damasceno, & Silva-Matos, 2012; Plotnikoff, Mayhew, Birkett, Loucaides & Fodor, 2004) and to have lower levels of physical activity (Martin et al., 2005; Van Dyck, Cardon, Deforche & De Bourdeaudhuij, 2011) in relation to the urban population. In studies conducted in Brazil, a higher rate of physical activity performed by the urban population corresponds to leisure activities (Bicalho, Hallal, Gazzinelli, Knuth & Velásquez-Meléndez, 2010; Monteiro et al., 2003), although not a single study has been found to date evaluating differences in physical activity related to place of residence for populations living in the northern part of the country. This particular aspect is relevant, considering that the concept of rural and urban can be argued, and the characteristics of rural communities can be quite different, not only among nations, but also among Brazilian regions (Sjölund et al., 2010).

Northern region of Brazil is inserted into the Amazon rainforest. Besides Brazil, the forest covers other countries of South America (Peru, Colombia, Ecuador, Venezuela, Guyana and Bolivia), forming in its entirety the Amazon basin. The population that lives in the region of the Brazilian Amazon, in its vast majority has mixed ethnicity, locally known as "*cabloco*", composed basically by origins: indigenous, European and African (Silva, Crews, & Neves, 1995). The demographic density of this region (3.9 people/km^2, on average) is the lowest among all regions of Brazil, being the second poorest region and the lowest Human Development Index (HDI) (Paim, Travassos, Almeida, Bahia, & Macinko, 2011). A large number of inhabitants of this region live in small urban environments with a limited amount of health tertiary services, in relation to large centers of the country. This region also has a part of the population living in communities along the banks of the rivers, the so-called "riverside communities", which comprise the rural area (Fig. 1). The access to these communities is by river, through rudimentary boats, which greatly limits the access to health services in general, concentrated in the majority in the urban agglomerations. This difficulty of accessibility also has negative consequences on education and opportunities for leisure activities.

Therefore, taking into account the limited knowledge of levels of physical activity in the northern region of Brazil, and the little urbanized cities of interior Amazonas, the aim of this study was to investigate levels of physical activity and risk factors for inactivity in older adults living in a town of the Amazonas interior.

2. Methods

A cross-sectional study was carried out in Coari town, Amazonas State between 2013 and 2015 (Fig. 2). Coari is located in the middle region of the Solimões river (latitude −4° 05′ 6.00″ S; longitude −63° 08′ 29.00″ W) (Fig. 3). Access to the capital of Amazonas state (Manaus) and other Brazilian states is possible only by air, or by river. Most population living in Amazon region use boats how main mean of transport. According to data from the Brazilian Institute of Geography and Statistics (IBGE, 2015), Coari have a low literacy and socioeconomic level, and thus, it is ranked among the group of cities with a low HDI in the Brazil (HDI: 0.586). In the last Brazilian Census realized in 2010, Coari had 75,965 inhabitants, of which, 3443 (4,5%) were individuals aged 60 years and older, distributed in following manner, 2913 (84,6%) were urban area, and 530 (15,4%) were of rural area from Coari. In addition, most of these older have lived in riverside communities at some point in their life. These communities have rural characteristics, with economic activities almost exclusively oriented toward agriculture and fishing, always relying on the Solimões River and its tributaries as a subsistence and means of transportation. Change from riverside areas to urban areas occur mainly due to the job opportunities and income generated by recent urbanization.

2.1. Research subjects

Sample for the study was defined considering follow parameters: population aged 60 years and older (n = 2.913) living in the urban area of Coari town in 2010 (IBGE, 2015); alpha level of 0.05; and 95% confidence interval. Sample size found was increased by 10% considering losses and/or refusals, totaling 269 individuals. A two-stage sampling procedure applied, considering census sector and residence in the urban area of Coari town, using IBGE database local to identification of older adults. After these steps, older adults were visited in their residence, and invited to participate of study. Our sample included just older adults living in urban area of Coari town. The interview and functional capacity assessment of the older adults were performed in their own home, after they signed an informed consent form. When an older adult was illiterate, their fingerprints were obtained after reading consent form by the researchers. The study excluded individuals who showed cognitive impairments that prevented them from answering the interview questions and performing the proposed tests, identified by the Mini-Mental State Examination, considering the scores according to education level (Bertolucci, Brucki, Campacci & uliano, 1994). The

Fig. 1. Riverside communities – Amazonas – Brazil.