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INEQUALITIES IN SPATIAL DISTRIBUTION OF PHYSICAL ACTIVITIES ON PRIMARY HEALTH CARE, CAMPO GRANDE – MS, BRAZIL

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ABSTRACT

Introduction: actions and services offered to the population can be analyzed through a geographical information system, such as in the case of data geoprocessing linked to the conditioning and determining factors of health. **Objective:** to describe the distribution of spatial offer of physical activity practice in the Primary Health Care, in the municipality of Campo Grande – MS, Brazil. **Methodology:** data referring to the the geographical distribution of the health units and occupancy of the Physical Education professionals were obtained from the Municipal Department of Public Health of Campo Grande – MS, Brazil. By using a questionnaire specially developed for this study, data on the offer of physical activity practice were collected in all health units of the urban area of the municipality, linked to the Primary Health Care and with practicing Physical Education professionals. **Results:** there was higher occurrence of art therapy, gymnastics, and walking exercises offered in the assessed context. The geographical distribution of those physical activities was heterogeneous in the municipality, with that service not being present in the neighborhoods with higher population density. **Conclusion:** there is an inequality in the geographical distribution of the offer of physical activity practice in units linked to the Primary Health Care, which represents a frailty to make and/or keep that population physically active.

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INTRODUCTION

Evidence of epidemiologic studies has shown that practicing physical activities regularly is associated to lower death risk by all causes, increased age expectancy, and better quality of life (FACHINETO *et al.*, 2013; PITANGA *et al.*, 2014; ZAAR; REIS; SBARDELOTTO, 2014). Therefore, the Brazilian government inserted the practice of physical activities in the strategy for health promotion, linked to the Unified Health System - UHS (RODRIGUES *et al.*, 2013).

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Therefore, Physical Education professionals (PEF) started being inserted in the Primary Health Care (APS) in many Brazilian municipalities, aiming to increase the practice of physical activities in the population (CARVALHO, 2006), like occurred in Campo Grande - MS (FERREIRA; FERREIRA; LIMA, 2016). To encompass the offer of actions and services provided to the population serviced by the Brazilian Public Health System, geoprocessing has shown to be a good quality mechanism (BARCELLOS *et al.*, 2003). However, studies with this methodological design are scarce in Brazil (SILVA *et al.*, 2015), even involving the offer of physical activities aimed to the promotion of the population's health serviced in the Brazilian Public Health System. In the light of this context, the present study was performed aiming to describe the spatial

distribution of the offer of physical activity practice in the APS in Campo Grande - MS.

MATERIALS AND METHODS

The study was characterized as exploratory, with a cross-sectional design, and a quantitative approach on the data analysis, developed in the APS network, of the municipality of Campo Grande, capital of the state of MatoGrosso do Sul, Brazil. In order to characterize the spatial distribution of the health units, the geographical coordinates (latitude and longitude) obtained through the *Google Earth* program were used. From the Brazilian Institute for Geography and Statistics (IBGE, 2016), the population quantitative and the digital mesh of the census sectors of the municipality (aggregated to the neighborhood level) were obtained. A database was organized to be analyzed in the geographical information system Terra View 4.2.2. Quartic kernel with radius of 3km and point thematic maps were produced. To calculate the population per neighborhood, the operation between layers, which adds the census sector population of a neighborhood and attributes that population total, was used. We used the digital mesh of health districts, superimposed on the neighborhood mesh, to better analyze the event in the context of the health service. Having as a reference the research instrument used by Rodrigues *et al.* (2014), a questionnaire was devised in order to acquire information about the offer of physical activity practice in health units in the APS. Each PEF linked to the teams of Basic Health Units (UBS), Family Basic Health Units (UBSF) or Family Health Support Center (NASF) of the Municipal Department of Public Health of Campo Grande - MS (SESAU) was invited to participate in the study. To those who showed interest, the Informed Consent Form (ICF) was presented. Only after signing the ICF, the information was collected, by filling in the research instrument (self-fillable), individually and confidentially. The research project was submitted for assessment by the Human Research Ethics Committee of the Federal University of MatoGrosso do Sul (CEP/UFMS) and was approved through the CAAE 46913715.1.0000.0021.

RESULTS AND DISCUSSION

The municipality of Campo Grande is the capital of MatoGrosso do Sul, a state in the Midwestern Region of Brazil. It has an estimated population of 863,982 inhabitants (IBGE, 2016) and the municipality is administratively organized in 74 neighborhoods and four Health Districts: North, South, East, and West (Figure 1). 14 PEF were identified linked to the APS in the municipal health network of Campo Grande - MS, who were distributed in the four Health Districts, with 7 (50%) in the West, 3 (21.4%) in the North, 2 (14.3%) in the South, and 2 (14.3%) in the East. The sheer distribution of PEF in the four Health Districts generates a potential range in the physical activity offer to the population, according to important dimensions of APS, such as communitary orientation, link, and accessibility (ELIAS *et al.*, 2006). Concerning the distribution of the types of health units per neighborhood in the urban area of the municipality of Campo Grande - MS, it was observed that the APS is organized in UBS, UBSF, and NASF, with the service offer varying according to the type of those units and teams constituting them. Figure 2 shows the spatial distribution of those units in the municipal health network, in the urban area of the municipality of Campo Grande - MS.

Considering that a fundamental attribute of the APS is its definition as first contact service or entryway to the health system (ESCOREL *et al.*, 2007), as to offer basic services of higher quality and to broaden the access to the higher complexity services, especially to the population with higher social vulnerability (GIL, 2006), a health unit distribution with large geographic coverage becomes essential in order to reach that goal. The data in Figure 2 indicate that such coverage is reflected in Campo Grande - MS, including UBS and UBSF in the four Health Districts of the municipality. However, it was observed that the NASF did not present the same geographic distribution range, since the East District did not have that type of service. The distribution of the types of physical activities offered in the health units of the APS of the urban area of the municipality of Campo Grande - MS can be observed in Figure 3.

The offer of physical activities linked to the APS in the municipality of Campo Grande - MS was highlighted by the development of art therapy, gymnastics, and walking activities (Figure 3). In smaller proportion, other forms of interventions were reported by the PEF linked to the APS, such as: physical evaluation, dancing, jiu-jitsu, games, Traditional Chinese Medicine exercises (Tai Chi Chuan, Liang Gong, and Xiang Gong), and exercises in the Elderly Gyms (ATI), supporting the data from Carvalho and Nogueira (2016). It is highlighted as a positive aspect that the group of all mentioned activities, with emphasis on those presented on Figure 3, represent improvement possibilities on components related to Chronic Non-communicable Diseases (DCNT), either related to physiological elements or to mental health (RIBEIRO *et al.*, 2006) of the population serviced in the APS. However, a frail point in the initiative to improve the population's lifestyle serviced by the APS was the detection of the lack of the Health Gym Program (PAS) in the scope of municipal health management (Figure 3). The HGP is one of the constant initiatives in the Strategic Action Plan to Combat DCNT in Brazil from 2011 to 2022, in order to increase the population's physical activity level (CARVALHO; NOGUEIRA, 2016). Figure 4 makes it possible to see the "hotspots" concerning the health units where there is offer of physical activities (a), as well as the total distribution of the health units linked to the APS in the urban area of the municipality of Campo Grande - MS (b). In this case, the higher density areas (high) were highlighted with the colors red/orange softening to the lower density areas, represented with the colors yellow/green. The distribution of the physical activity offer in the APS is not homogeneous among the Health Districts of the municipality of Campo Grande - MS (Figure 4), since three of those districts (North, South, and West) concentrate the largest number of interventions. Proportionally, the offer of physical activities in the whole municipal health network of Campo Grande - MS encompasses approximately 33% of the population linked to the APS, while the national scene shows values around 63%, with the Brazilian Midwestern Region presenting values of 43% (TEIXEIRA *et al.*, 2014). In this context, a particular and substantial concern is present, since physical activities are an important factor for the prevention and treatment of adult obesity and overweight (HALLAL *et al.*, 2010) and the data from the Risk Factors Surveillance and Chronic Disease Protection via Telephone Inquiry (VIGITEL) show an increase on the number of obese and overweight adults in the municipality of Campo Grande over the last decade, reaching values of 58% of the adult population with excessive body weight in 2016 (BRASIL, 2017).

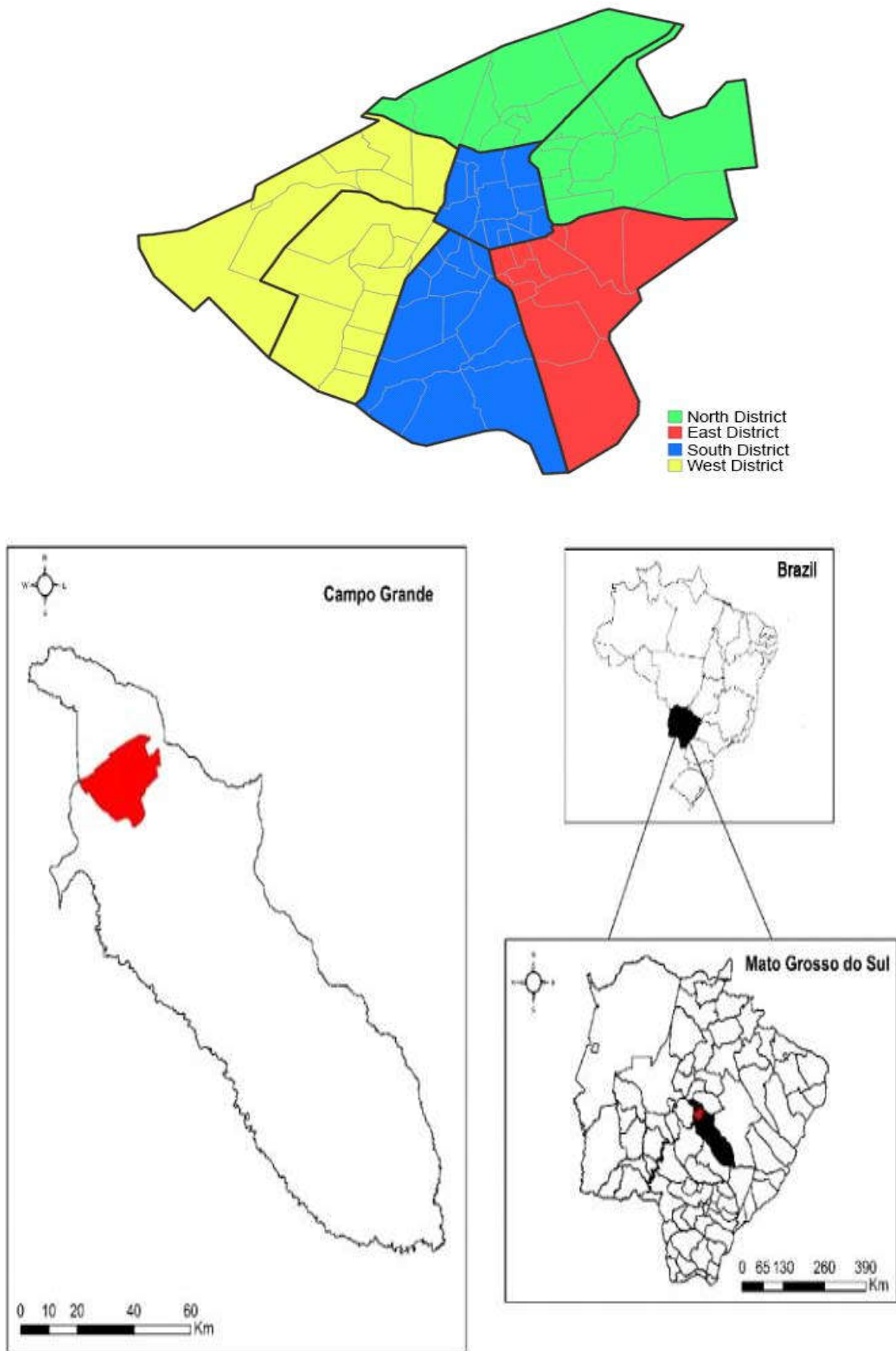


Figure 1. Map of the location of the Municipality of Campo Grande – MS, Brazil, with the highlighted urban area and its Health Districts

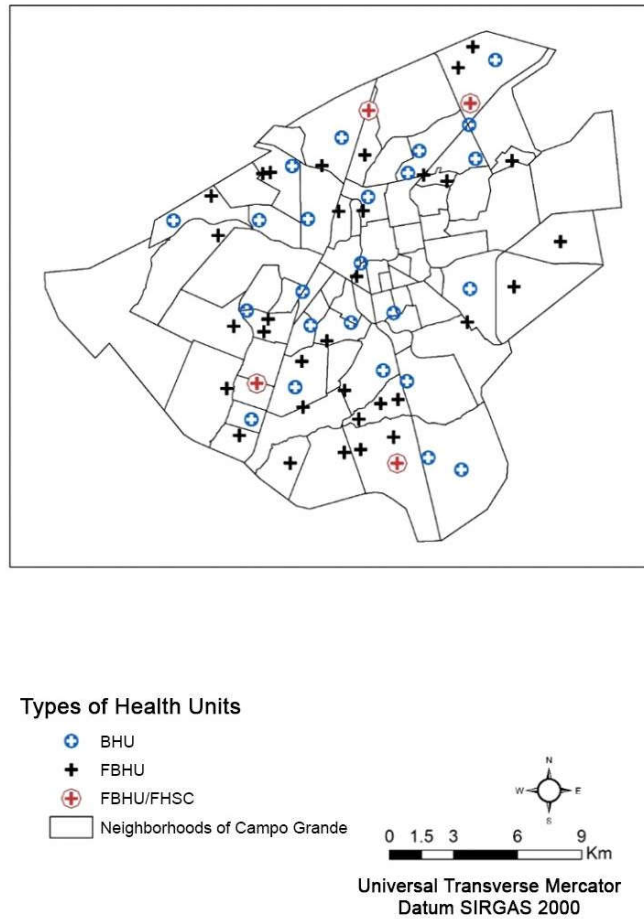


Figure 2. Map with the types of health units of the APS of the urban area of the municipality of Campo Grande - MS, Brazil, 2016

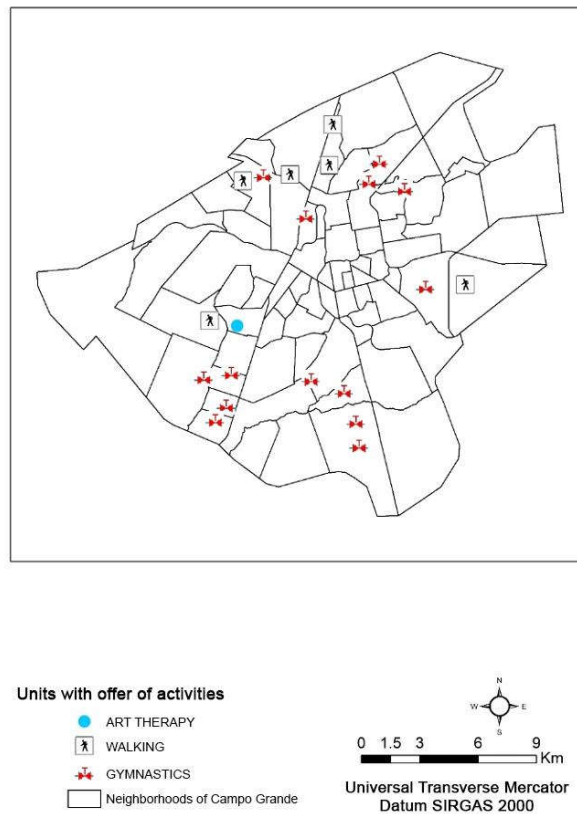


Figure 3. Map of the main physical activities offered in the health units of the APS of the urban area of the municipality of Campo Grande – MS, Brazil, 2016

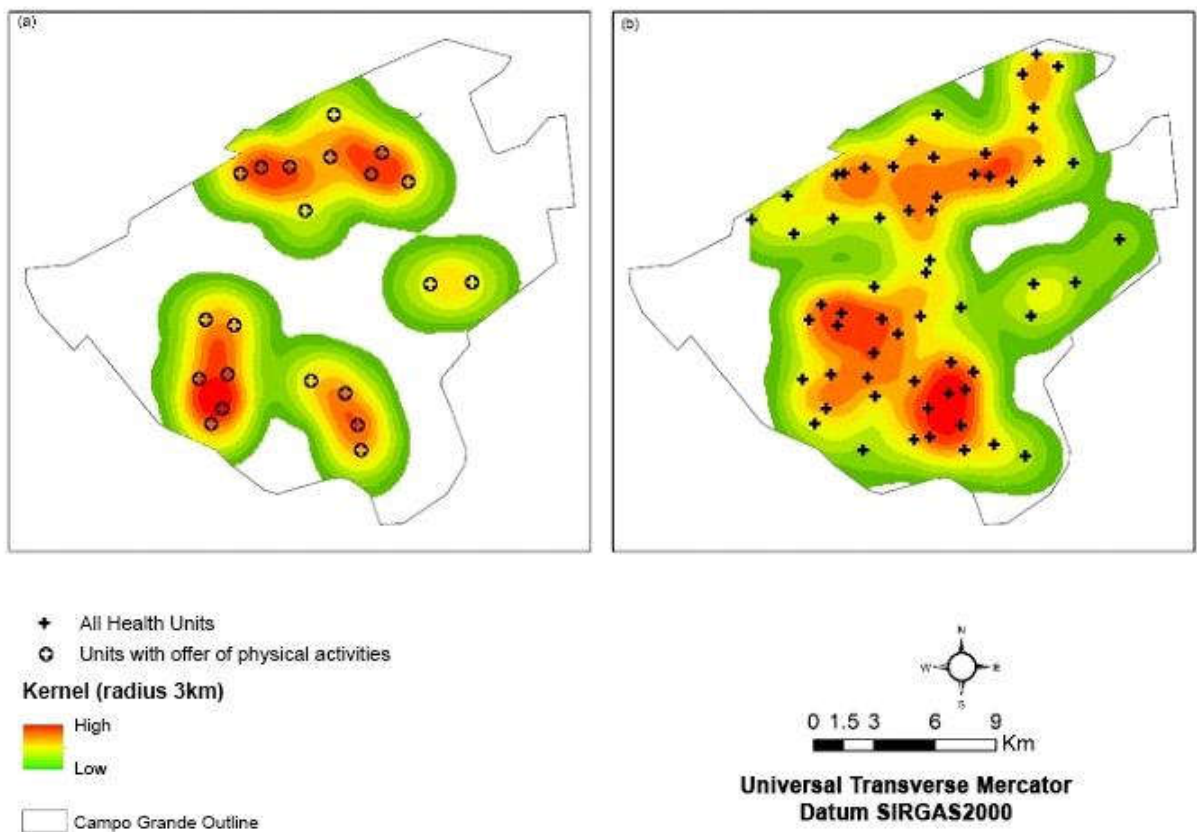


Figure 4. Distribution density of the health units and of the physical activity offer in the APS in the urban perimeter, Kernel method. Campo Grande – MS, Brazil, 2016

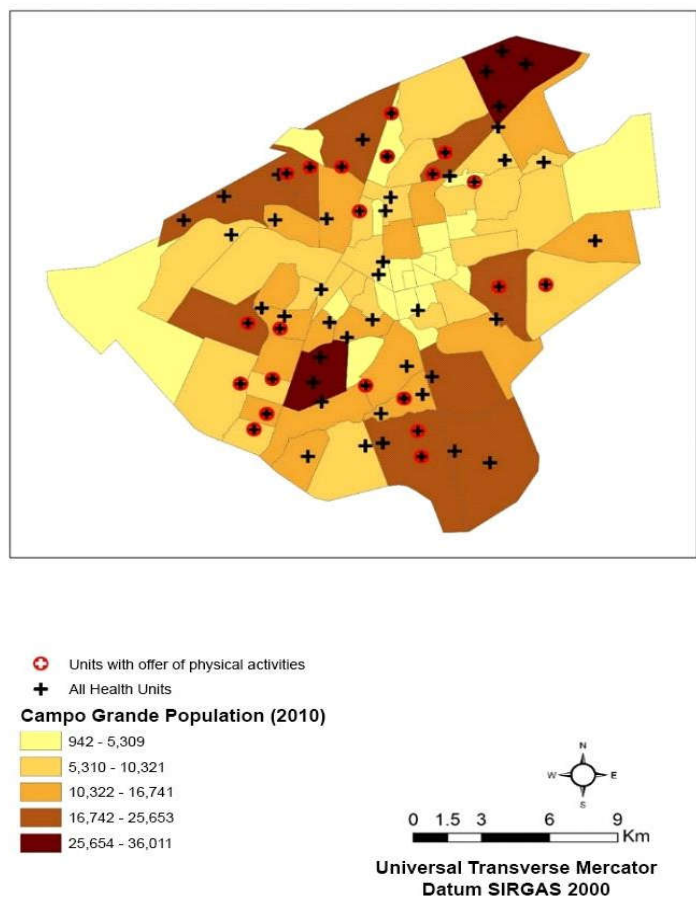


Figure 5. Distribution map of the health units, physical activity offer in the APS, and resident population per neighborhood, in the urban perimeter of the Municipality Campo Grande – MS, Brazil, 2016

Finally, Figure 5 presents the neighborhood distribution in the municipality of Campo Grande - MS, with the resident population and the health units in those locations, both the ones which offer physical activity practice and the ones which do not provide that service. The population density is presented with darker colors when there is higher concentration of people and, inversely, with lighter colors in places with lower population density. The offer of physical activities is distributed throughout several neighborhoods of the municipality, but in this study it was not possible to identify a pattern regarding its organization, since the offer includes the several population density ranges and, at the same time, there is an absence in a number of neighborhoods (Figure 5).

Knowing that the offer of physical activity practice was listed by the Brazilian Ministry of Health as one of the main actions to combat DCNT in the country (BRASIL, 2011), a larger range was expected in the public policy aiming to the goal of making the population of the municipality of Campo Grande - MS more physically active. However, the data on Figure 5 show that in two areas of the municipality (North and West), there are neighborhoods which are highlighted for having high population density and considerable concentration of health units, but with a lack of offer of physical activity practice. Possibly, this situation represents a frailty in the proposal to make and/or keep that population physically active through actions performed by the public health policy in the municipal scope. Analyzing the socioeconomic profile of the population residing in the municipality of Campo Grande - MS (CAMPO GRANDE, 2016), it was possible to identify the *per capita* income of the resident citizens in each neighborhood of the urban area, where the Health Districts and the health units are located, either with or without offer of physical activity practice. Firstly, it was apparent that most health units in the APS are present in the neighborhoods with lower *per capita* income and with high population density, a fact considered appropriate and recommended (JANCZURA, 2012). But physical activities are not on the same level of local population care, for both of the most populous neighborhoods of the municipality do not offer such activities together with the health units linked to the APS. In that sense, Carvalho and Buss (2012) warn about the importance of equal intervention distribution in the public health policies regarding the social welfare. Lastly, although the urban area of the municipality of Campo Grande - MS already has an offer of physical activity practice in the scope of the APS, there are frailties concerning its geographical distribution, exactly identified by the geo processing analysis employed here, which deserve better and deeper discussions with the local public power.

Conclusion

The spatial distribution of the offer of physical activity practice in the APS of Campo Grande – MS, Brazil, has shown to be heterogeneous, as that offer is distributed in health units of different neighborhoods of the municipality, but they did not present a “pattern” regarding their organization. As to the offered physical activities, a diverse repertoire was found, with higher frequency of art therapy, gymnastics, and walking exercises. Health units linked to the APS are present in every Health Districts of the municipality, including the neighborhoods with higher population density. However, the offer of physical activity practice is not present on those neighborhoods, a fact which may show a frailty in the proposal

to make and/or keep that population physically active through actions performed by the public health policy in the municipal scope.

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