

**Rio 2016: An assessment of the impacts of the
Olympic Games on health and physical activity of
women living in a low socio-economic status
community**

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Common abbreviations

PA	Physical Activity
SES	Socio Economic Status
PARs	Physical Activity Resources
LTPA	Leisure Time Physical Activity
TRPA	Transport Related Physical Activity
BMI	Body Mass Index
NCDs	Non-Communicable Diseases
IOC	International Olympic Committee
IPAQ	International Physical Activity Questionnaire
PARA	Physical Activity Resource Assessment
QI	Quality Indicator
WHO	World Health Organization
FDA	Foucauldian Discourse Analysis
NGOs	Non-Government Organisations
SDI	Social Development Index
OR	Odds Ratios
CI	Confidence Intervals

List of Papers

This dissertation is based on the following research papers:

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Sousa-Mast FR, Reis AC, Sperandei S, Gurgel LA, Vieira MC, Pühse U. Does being an Olympic city help improve recreational resources? Examining access to physical activity resources in a low income neighborhood of Rio de Janeiro. *Int J Public Health.* 2017; 62 (2): 263-268. doi: 10.1007/s00038-016-0827-7.

Sousa-Mast FR, Reis AC, Sperandei S, Gurgel LA, Vieira MC, Pühse U. Physical activity levels of economically disadvantaged women living in the Olympic city of Rio de Janeiro. *Women Health.* 2016; 56 (5): 595-614. doi: 10.1080/03630242.2015.1101745.

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Summary

In 2016, the XXXI Summer Olympic Games took place in Rio de Janeiro. In line with the bidding procedure and the hope for an Olympic legacy, the Brazilian government and the Rio de Janeiro City Council made commitments to deliver lasting improvements to the city's residents. These improvements relate to infrastructure like transport and facilities, but also residents' health and well-being. Such health benefits, in particular those concerning physical activity (PA), were promised to be delivered through national and regional policies and interventions. According to official documents, changes would begin to be implemented in the years preceding the Games and one of the legacy promises was to use the event to stimulate people to engage in LTPA/sport. The main purpose of this thesis was therefore to assess the impact of the 2016 Olympic Games on LTPA/sport participation of the local population. Specifically, the investigation focused on women living in Cidade de Deus, a low socio economic status (SES) community located closely to the Olympic park. A mixed-methods design using document analyses, interviews, observations and a questionnaire were used to produce data. The results of the investigation provided insights into sport policies delivered for this low income community, the physical environment for the practice of LTPA and sport available in Cidade de Deus, the PA patterns of women from this community and how public health discourses concerning health and PA have a significant impact in shaping the health and PA discourses of these women.

CHAPTER 1

Introduction

Physical activity and health

Regular physical activity (PA) has long been regarded an important component of a healthy lifestyle [1, 2, 3]. According to Reiner et al. (2013) and Kruk (2007), studies worldwide have reported that regular PA prevents the occurrence of many chronic diseases as well as reduces the risk of all-cause mortality [2, 4]. Specifically, studies have shown that regular engagement in PA is related to minimizing the risk of type 2 diabetes and coronary heart disease [5, 6, 7]. In addition, studies have constantly shown that physical inactivity is an important risk factor for a number of non-communicable diseases (NCDs), such as diabetes, heart disease and stroke [8, 9].

Interestingly, despite the wide scientific knowledge of the benefits of regular PA participation on health, one fifth of the world population remains physically inactive and therefore promoting and dealing with population patterns of PA engagement has increasingly become a major public health issue [1, 10]. However, it is important to highlight that the levels of PA are not equally distributed in society and some groups are far less active than others [10], and therefore, investigating the reasons for inequalities in PA is important for improving the world population health.

In order to contribute to the broadening of the existing scientific knowledge of PA and health, this study pays particular attention to the impacts of sport mega events on PA and health in a developing country context. Specifically, the study assesses the impacts of the 2016 Olympic Games, hosted in Rio de Janeiro/Brazil, on sport policies, physical activity resources (PARs), PA behaviours and PA/health discourses. To achieve its aims, this study analyzed:

- The sport policies and sport programs developed in Cidade de Deus, a low socio economic status (SES) community located close to the Olympic park;

- The public PARs available inside the boundaries of this neighborhood,
- The levels of PA of women living in this community and
- The perceptions of women from Cidade de Deus concerning the impacts of the 2016 Olympic Games on their and their community's health and leisure-time physical activity (LTPA)/sport participation.

The guiding questions of the investigation were:

(1) How has the Brazilian government been delivering LTPA/sport opportunities/programs for low SES groups in the context of significant investments in sport mega-events?
(2) How have people living in a low SES community benefited from government investments in sport mega-events?
(3) What is the quality of public PARs available in a low SES community of Rio de Janeiro?
(4) What are the PA levels of women from a low SES community of Rio de Janeiro, when one considers occupational, household, leisure time and transport-related physical activities?
(5) What expectations did women have for the 2016 Olympic Games regarding health and LTPA/sport?

Physical Activity and Female Population

Rates of PA are not distributed evenly in society and several studies indicate that women are less active than men during their leisure time [10, 11, 12, 13]. As a consequence, many women around the world do not reach the levels of PA for health enhancement. Additionally, many researchers confirm that women from low SES communities are even less likely to achieve the recommended levels of PA [14, 15, 16, 17]. According to Vrazel, Saunders and Wilcox's (2008) review, women lack the social support to adopt and maintain an active lifestyle [18].

In Brazil, studies also suggest that women are significantly more sedentary than men during their leisure time and that socioeconomic and educational levels also have considerable influence on the levels of LTPA in this country [10, 19, 20]. For instance, a study conducted by Gomes, Siqueira & Sichieri (2001) demonstrates that women in Rio de Janeiro are less active during their leisure time, choose activities that use less energy and have a

lower median duration when compared with men [21]. Importantly, these deficits in PA participation during self-directed time, according to these researchers, are also linked to women's levels of education and income [21].

Concerning the constant scientific reports of women's low participation in sport and LTPA, Fullagar (2003) points out that the current public health policies worldwide have gendered active leisure [22]. Importantly, the author claims that public health discourses universalized masculine experiences as the norm for healthy living, emphasizing that the biomedical and epidemiological discourses of health risk embedded in health policies do not contextualize the meaning and construction of women's active leisure. In fact, several authors have argued that many public health programs are symptomatic of a dominant medical culture that is moralistic, sexist and class prejudiced [23]. Furthermore, Fullagar & Brown (2003) highlight that health promotion campaigns and reports do not take into consideration the broader socio-political inequities that women experience in relation to household roles, work and leisure, and therefore describe these merely as barriers to participation in PA [24].

Physical Activity and Low Socioeconomic Status (SES) Individuals

It is important to note that women are not the only group in society that has been constantly reported as not achieving the public health recommendations of levels of PA for health improvements, and therefore considered as physically inactive or sedentary. Individuals with low SES profile or living in low SES communities have also been reported as having low levels of PA or being sedentary. For example, Carrol and colleagues (2011) show in their study that physical (in)activity and its health-related consequences have been constantly linked with socioeconomic levels [25]. Withall, Jago and Cross (2009) report that obesity and its associated chronic diseases are most pronounced in economically disadvantaged groups, arguing that low income impacts on the ability to purchase healthy food and to have access to sport/recreational facilities [26]. Cerin and Leslie (2008) add that individuals with higher income have more opportunities to choose activity-friendly environments to live in and to more easily obtain social and material resources that are helpful in maintaining an active lifestyle regardless of adverse conditions that may affect them (e.g., lack of family support; lack of facilities in the neighbourhood) [27]. In addition, Townshend and Lake (2011) argue that low SES neighbourhoods tend to have environments

that are less conducive to healthy lifestyle choices while, at the same time, providing easy access to large amounts of energy dense foods [28].

Kohl 3rd and colleagues (2012) report that in many Latin American countries rapid economic development and social changes have altered the population health trend from previous decades, going from undernutrition and micronutrient deficiencies to over-nutrition and obesity. In parallel, the aging of the Latin American population has led to an increase in the prevalence of NCDs. Based on these new health trends, the authors discuss the importance of developing strategies for LTPA targeting the Latin American population, where occupational, domestic, and transport-related physical activity (TRPA) tend to contribute more to overall energy expenditure [29].

Specifically in the Brazilian population, Hallal and colleagues (2012) highlight that although the prevalence of physical inactivity increased between 2002 and 2007 among individuals with low SES, no significant differences were reported against those in the higher income brackets. The authors argue that this change might have been caused by a decrease in occupational PA (more commonly performed by people on lower incomes) and an increase in LTPA (more common among people on higher incomes). In addition, the authors suggest that physical inactivity has not received significant attention as a serious public health issue from governments and policy makers in Brazil [30].

Physical Activity and Public Health

The high levels of physical inactivity or sedentarism in the world population and its health related consequences have been mostly promoted as a problem of individual behaviour or lifestyle, and therefore, most health promotion campaigns worldwide have taken a medical approach focused on changes in individual behaviour and lifestyle, largely disregarding cultural or socioeconomic issues that have been shown to strongly contribute to sedentary behaviour [31, 32].

Importantly, public health agencies worldwide have been focusing their attention on the need to increase PA as a priority to achieve global health improvements. With this recognition, it is also understood that levels and choices of PA are significantly related to environmental variables [33]. Townshend and Lake (2009) suggest that many contemporary urban environments do not support healthy lifestyle choices and are implicated in increased levels of obesity. Furthermore, they argue that the environment influences the high levels of

obesity mainly through food intake and PA [34]. According to Brownson et al. (2004, p. 473) “the physical, or built, environment is important in providing cues and opportunities for activities and it is associated with rates of PA in intervention studies and in large population-based surveys” [35].

Advances in public health, such as the reduction in rates of obesity, cardiovascular disease, diabetes, cancer, hypertension, depression and osteoporosis mean that some of the most harmful health problems are those that are within human control: healthy eating, engaging in PA, and living in a healthy environment. These habits are important factors that can improve the human quality of life and well-being [36]. In contrast to this individualized view of health, Owen et al. (2004) believe that substantial and long lasting environmental and policy initiatives can make choices related to PA easier and more realistic. If a public health agenda is to be pursued with confidence, research is needed to determine whether environmental initiatives (such as providing cycle paths and walkways, or public outdoor recreational facilities) increase the likelihood of more active behavioral choices [37].

Physical Activity and Built Environment

Many scholars (e.g. Foster and Giles-Corti, 2008; Humpel et al., 2002; Sallis & Glanz, 2006) have been interested in evaluating the impact of the built environment on levels of PA [38, 39, 40]. For instance, results have supported the conclusion that built environment is an important predictor for PA engagement [41, 42, 43]. Particularly, studies in this field have focused on the characteristics of the neighborhood of residence and their impact on PA behavior of the local population [44, 45]. Significantly, results have shown that living in a more walkable neighborhood increases the adoption of the habit of walking for exercise; PARs are less available in low SES neighborhoods; and the quality and maintenance of existent PARs is an economical strategy to increase PA participation [44, 46, 47, 48].

Interestingly, government agencies and organizing committees of mega sport events have promoted the environmental urban regeneration necessary for their hosting as a great opportunity for enhancing the number of sport facilities and consequently improving health quality through sport participation [49, 50, 51].

Physical Activity and Sport Legacies of the Olympic Games

The Summer Olympic and Paralympic Games have been claimed by organisers and governments alike as an event able to inspire and promote sport participation, play and other forms of PA as well as change the physical environment to provide more facilities for these to take place [52]. However, for Poynter and MacRury (2009), these claims need to be treated with caution. According to these researchers, the scope and cost of the Games demand that organizers deliver a range of non-sporting outcomes for the host city and nation [53]. Outcomes like increasing sport participation within the local population require dedication and commitment and need to be supported both financially and politically [54].

Significantly, in the Brazil's Candidature File for hosting the 2016 Olympic Games it is stated that the Olympic Games will leave important legacies for low SES communities [51]. However, the five initiatives described as a priority in Rio's sport legacy plan, all directly benefit the Brazilian elite sport (e.g. Athlete scholarship, Olympic training center, increased federal investments in sport for supporting Brazilian athletes and parathletes, legacy training facilities and national technical official trainings). In other words, the infrastructure for elite sport as well as sport programs for improving the Brazilian Olympic and Paralympic teams were given high priority and are thus often cited, while initiatives for increasing sport participation within the general population are not clearly described [51].

In light of this complex context, the main objective of this study was to assess the impacts of the 2016 Olympic Games on health and LTPA/sport participation of women living in a low SES community.

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CHAPTER 2

Literature Review

2.1. Public Policies in Sport and Physical Activity

2.1.1. Public Policies

Policies are actions organized by different sectors of society, such as, governmental, non-governmental and private organizations. Particularly, policies intend to achieve goals supported by specific strategies [1]. Policies determine how the environment should be modified to obtain desired outcomes and define the responsibilities of involved actors and allocation of resources [1]. Furthermore, policy can be formal or legal, and can be expressed in written form (such as legislation and other policy documents) or in an unwritten basis for example on practical programs [2]. Significantly, policies are typically the final results of a series of negotiations between various stakeholders and not merely decisions on particular topics/areas [3]. Specifically, public policy refers to policy developed or enacted by different levels of governments. According to Schöppe *et al.* (2004), “public policy is closely connected to people’s lifestyles because it sets the terms for individual choices. By the options it creates for institutions, groups and individuals it sets the bounds for what can be done” [1, pp. 7].

Importantly, there are several key elements of public policy that aim to affect change and therefore include: leadership that informs and motivates; economic incentives that encourage and facilitate change, and science that aims to move frontiers [4]. Significantly, in the 1980s it was recognised that a vast array of public policies have great potential for health promotion and that this potential should be developed [5]. Additionally, Schöppe, Bauman and Bull (2004) suggest that all public policies affect, directly or indirectly, health, and, consequently, all public policy sectors contribute to health public policy, and therefore, all policymakers should be aware of the health consequences of their decisions [1].

Furthermore, Schöppe, Bauman and Bull (2004) assert that supportive environments for physical activity (PA) and health promotion demand policy interventions beyond the

health and sport sectors. The authors argue that to develop supportive environments, other sectors, such as recreation, education, transport, urban safety, urban planning and environment, have to be integrated and actions have to be promoted by governmental and non-governmental organizations as well as private sectors[1].

Although sports promotion has a long history in many countries, examples of comprehensive national strategies that promote health through PA are still rare [6]. Notably, Schöppe, Bauman and Bull (2004) highlight that public policy concerning PA must develop strategies that contribute to increase active lifestyles among the whole population, giving that individual-oriented strategies produce small effects on population PA levels [1].

2.1.2. Sport and Physical Activity Policy

Sport, leisure time physical activity (LTPA) or active recreation as a public policy issue has not been prioritized by governments' political agendas worldwide [7, 8]. However, this trend has changed in the early twenty first century when countries diverse as Canada, China, Singapore and United Kingdom started to significantly support sport development-related activities [7]. Importantly, some researchers argue that the historical and political context of the countries, the heritage of institutions which deliver sport programs, projects and policies, and the collective social values of sport within each society guide the strategies implemented for sport and PA developments [7,9].

Interestingly, the ways in which sport or PA policy discourse has been or is elaborated by politics/governments contribute to privilege some sport manifestations and undermine others [10]. For instance, the manifestation of elite sport development as a key policy concern in the United Kingdom has been the political focus from the mid-1990s [10]. In Australia and Canada elite sport has been also privileged by government policies, despite some small changes recently [7, 11]. Indeed, research has reported that there is a lack of representation in sport policies for mass sport participation in Australia and Canada and more recently in the United Kingdom, where elite sport interests, values and beliefs are at the forefront of federal sport policy priorities [11]. Significantly, studies worldwide have shown that the pursuit of sporting excellence on international events have been perceived by politics as an important strategy to achieve other social goals related to sport and have consequently guided policy plans for sport development [11, 12, 13,14].

It is important to highlight that governments in different parts of the world tend to utilize sport programs/policies to achieve a variety of social goals, such as, increasing educational attendance among the young population, reducing youth crimes and drug addiction, enhancing population health, promoting social inclusion, and raising international prestige [11]. Researchers have oft contested the assumed broader positive social impacts of sport programs/policies on society [15, 16]. For instance, Waddington (2000) argues that policy makers take for granted that sport is a medicine for many social and health problems of the society without any empirical evidence [16]. Amongst the most acclaimed benefits of sport are: the improvements of physical and mental health; teaching to work co-operatively; helping to break down barriers of race/ethnicity, class and gender; and the building of friendship [15]. However, for Waddington, the reality not always corresponds to the above cited benefits, and therefore, sport may have positive consequences under certain circumstances and may have negative consequences under different circumstances [16].

Concerning sport policy implementation, the top-down approach has been perceived as a barrier for a more successful sport development in countries around the world. For instance, in the United Kingdom, during the preparation for the 2012 Olympic Games, many voluntary sport clubs were not aware of their role in the national sport policy or interested in complying with the top-down approaches of policy implementation [17]. Additionally, New Zealand has experienced significant changes in public sport policies, such as, the 'sport for sport's sake' approach in 1980s, to health and PA in the middle of 1990s, and more recently, to initiatives that intend to engage more school-age children in organized sport. The regional/local organizations responsible for implementing and delivering these policies have complained about the significant changes in sport policy approaches and the difficulties in fulfilling all new policy requirements [18].

Other issue regarding sport policy is the decline of sport-for-all approach in many countries. For example, in the UK public investment in sport and PA policies have moved away from a sport for all approach, where the aim was to provide a variety of sports and PA for the whole population, to a more targeted groups approach, which have particularly focused on children/youth and elite performance athletes [19].

A study conducted in the Netherlands suggests that despite the annual growth of public investments in both sport-for-all related programs and elite sport development, the increasing focus of sport policy on achieving the top 10 position in the global sporting stage

might have a negative effect on government support for sport-for-all activities in the near future [20].

In a Scandinavian study, the sport-for-all policies established in Denmark, Sweden and Norway were analysed and it concluded that despite the Scandinavian countries possessing more inclusive sport policies than many other countries, the sport organizations responsible for implementing the national sport policies are exclusive in at least two ways: low levels of participation in organized sport among adolescents and the patterns of participants favouring the middle class. Furthermore, this study suggests that sport-for-all policies are difficult to be entirely implemented in these countries, once the competitive approach dominate their sport system, and therefore, is extremely difficult to reconcile the implementation/delivery of sport-for-all policies with the competitive perspective of sport organizations [21].

It is interesting to note that despite the European Union being active in promoting the importance of sport per se and its educational and social values as well as the ratification in mid-1970s of the European sport-for-all charter, until the present day the member states of the European Union have not yet succeeded in implementing the ideals of sport-for-all described in the European Charter [9]. Not surprisingly, the challenge to implement the sport-for-all policies faced by sport organizations and sport systems in Europe is partially caused by a long-term emphasis on competition, physical improvement and performance as reference points for sport and recreational PA, and such a performance-oriented concept is not compatible with the sport-for-all goals, which emphasize recreation, amusement and relaxation and an equal opportunity of participation across all society groups [9]. After the description of how sport policies have been experienced by many western countries, the next step will be the description of sport policies in Brazil.

2.1.3. Sport and Physical Activity Policy in Brazil

The Ministry of Sport is currently the highest public agency for sport development in Brazil. However, since the beginning of the nineteenth century, different federal agencies have been responsible for developing sport policies in Brazil. For instance, from 1937 to 1970 the Brazilian sport system was under the control of the Physical Education Division of the Ministry of Education and Culture; after that, in 1970, the Department of Physical Education and Sport replaced the Physical Education Division, and in 1978 this department

was transformed into the Secretary of Physical Education and Sport. All of them, however, were always connected to the Ministry of Education and Culture [22, 23].

From 1995, sport started to be more predominantly featured in Brazilian politics. The Extraordinary State Ministry of Sports was created this year and subsequently replaced by the Ministry of Sport and Tourism in 1998 [22, 23]. Finally, in 2003, the then president Luís Inácio Lula da Silva (Lula) created the Ministry of Sport in order to have an institution that would be exclusively dedicated to sport and structured to implement the Brazilian Constitution of 1988, which classifies sport in three different dimensions: educational, recreational and elite [22].

It is important to note that the federal agencies responsible for developing sport in Brazil until the end of the military dictatorship in 1985 were more focused on promoting high performance sport, strengthening the Brazilian participation in the world stage, and improving the physical fitness of the population [24]. After the promulgation of the new Constitution in 1988, sport has been oriented toward a more democratic approach, with the constitution determining that sport is a social right, or, in other words, sport is a right of all Brazilian citizens [25].

Significantly, the Ministry of Sport was created to develop national sport policies through the proposition of laws, the designing of projects and the implementation of programs. To achieve its aims, the Ministry of Sport is divided in four secretariats: 1) Executive; 2) Sport, Educational, Leisure and Social Inclusion; 3) Soccer and Fan's Rights, and 4) High Performance, which is composed by the following departments: a) Grassroots Sport and High Performance Sport, b) Sport Excellence and Events Promotion, and c) Sport Infrastructure [26, 27]. Apart from the Ministry of Sport, at state and municipal levels there are organizations, normally named secretariats, responsible for developing their own sport policies with full autonomy [26].

Another important step towards a more democratic development of sport in Brazil was the creation of the National Sport Conference in 2004. This conference was the first opportunity for different segments of the civil society to discuss, deliberate and formulate public sport policies in Brazil. Its results were published in 2005 and suggested an urgent need to construct the National Sports Policy and National Sport System. In 2006, the second edition of the National Sport Conference was held and its main aim was to develop the National Sport System, which should contribute to the universalization and democratization

of sport in Brazil. However, the third edition of the conference that was held in 2010, one year after the Brazilian election to host the 2016 Olympics, changed completely its focus and concentrated discussions and efforts on building a ten-year plan for Brazilian sport that was high performance sport oriented [24].

Importantly, many studies in Brazil have shown that hosting sport mega-events have not contributed positively to the democratization of sport in the country. For instance, Almeida et al. (2012) reported that federal investments in sport from 2004 to 2009 prioritized elite sport and mainly the hosting of sport events, such as the 2007 Pan American Games, the 2014 FIFA World Cup and the 2016 Olympic Games. The authors found that 77% of all federal public resources allocated to sport were used to support elite sport development and mega-events, while less than 7% was allocated to mass and educational sport programs [22]. Castro et al. (2016) assert that sport mega-events have strongly influenced the amount and distribution of the public resources in sport in Brazil. The authors analyzed the budget planning and budget execution processes from 2004 to 2011 and they found that during the budget planning process the promotion of sport participation was considered a priority for the government, but during the budget execution process the elite sport and hosting the 2007 Pan American Games was prioritized. Official data analyzed by Castro and colleagues demonstrate that despite the program “Towards the 2007 Pan” lasting just from 2004 to 2007, it received the largest amount of federal resources spent on sport from 2004 to 2011, and it represents 37.35% of the total amount of money spent in sport during this whole period [28].

Despite investment in elite sport being a priority of Brazilian governments, research has shown that sport policy for a sustainable elite sport development has not been prioritized. Böhme et al. (2012) analyzed information about sport facilities encountered in the elite sport policy inventory and found that there are no public policies regarding the implementation and maintenance of sports trainings centers for elite athletes and that the scarce initiatives are concentrated in a few states. Furthermore, the authors also assert that the public financial resources required for building or renewing sport facilities have been spent by Brazilian governments in hosting sport events, which have been largely held in major economic centers like Rio de Janeiro and São Paulo [29].

In addition, another study shows that despite the availability of financial resources for the development of elite sport in Brazil, the strategic planning and integration in elite

sport policy are deficient. Mazzei and colleagues (2015) show that the lack of central guidelines for implementation of sport policies and the great autonomy given to non-governmental and governmental institutions to develop their own sport policies are not favorable to a consistent implementation of a national sport policy. Furthermore, the authors point out the ineffective management of financial resources regarding to policies with long-term goals, and they claim that for a sustainable elite sport development in Brazil it is important to increase the number of sport facilities and well-structured sport programs available for the whole population, to create and support organizations to receive young talents, and improve research centers and educational institutions for coach training [26].

Following this overview of the different deficiencies in the development of sport policies in Brazil, it is important to highlight that one of the most relevant issues concerning sport policy in the country is the mismatch between the priorities established by the Brazilian Constitution and the priorities established by Brazilian governors. The Brazilian Constitution determines that the state has to promote sport as a right of each citizen and public funding has to be priority directed to educational sport [22, 28]. However, constant investment in sport events and the prioritization of elite sport over educational and grassroots sports have interfered with the process of democratization of sport and recreational leisure in Brazilian society [28].

2.2. Discussing Physical Activity and Health in Disadvantaged Populations

2.2.1. Physical Activity, Health and Low Socioeconomic (SES) population

Research has constantly demonstrated that income inequalities have a significant impact on health and well-being [30], with some authors arguing that social class is the most important risk factor for diseases such as cancer, cardiovascular illnesses and hypertension [31, 32]. Significantly, despite the declining death rates worldwide, the health gap between those who are at the top social class gradients and those who are at the bottom has broadened and continues to increase every year [31, 33].

Importantly, also physical (in)activity and its health-related consequences have been constantly linked to socioeconomic status [34]. Research worldwide has shown that obesity and its associated chronic diseases are most reported within economically disadvantaged groups, individuals with higher income are better able to afford activity-friendly environments to live in and to obtain social and material resources that are helpful in

maintaining an active lifestyle, and that low income neighbourhoods tend to have environments that are less conducive to healthy lifestyle choices [35, 36, 37].

Significantly, studies have reported that in the last 30 years the population of developing countries have experienced progressive economic development as well as substantial changes in body weight, diet and PA levels [38]. The new health pattern of developing countries nations has been impacted by changes in lifestyle, for instance, the increasing of energy-dense diet consumption and the decreasing of overall energy expenditure (i.e. occupational, domestic and transport-related PA – “TRPA”) as well as changes in environment (i.e. urbanization growth) [38, 39].

Additionally, a study asserts that there is a dearth of research focused on the influence of SES on PA levels. This study suggests that the main influences of SES on levels of LTPA are: low availability of public physical activity resources (PARs) in low SES neighbourhoods; low SES individuals report to perform less vigorous intensity of PA during LTPA than their high SES counterparts, and lack of self-confidence towards LTPA/sport practices is greater in low SES populations [38].

In order to deal with the low levels of PA in low SES communities, the World Health Organization (WHO) has produced reports and guidelines that provide information and suggestions for governments to plan their own strategies to better tackle the health issues associated with low levels of PA in this population group [40, 41, 42]. However, a study based on the perceptions of community leaders and residents of a low SES neighbourhood in North Ireland concerning PA interventions and its implementation asserts that increasing the levels of LTPA in low SES communities is a complex task that requires better communication by service providers about the PA interventions programs and its benefits for the individuals/community, a greater community involvement in the planning phase of the project, and a sustainable intervention program (i.e. continuous funding for the sport/PA program and available facilities inside the community) [43]. Another study highlights that it is important to take into consideration the particularities of different target groups before the implementation of sport/PA programs in low SES communities [44]. For instance, individual and social factors were positively associated with LTPA, while individual, and social factors, as well as the walking environment were associated with TRPA in women from low SES neighbourhoods [44].

It is important to note that the prevalence of low levels of PA and high rates of obesity in low SES individuals have been reported not only in the adult population, but also in children and adolescents [45, 46, 47]. Research findings have shown that children from different ethnical backgrounds, with lower family income tend to be at a high risk of obesity, poor health and physical fitness than those children in higher family incomes [45]; children from low SES communities are more prone than children from higher SES to spend more time in sedentary behaviour, have low levels of PA and higher Body Mass Index (BMI), all of which increase health risks [46]; and a systematic review shows that despite research findings worldwide not being very uniform, adolescents from low SES communities are less physically active than their counterparts from high SES communities [47].

Interestingly, a Brazilian study highlights that the public health recommendations of increasing participation in PA are mostly focused on LTPA, which has a minimum impact on low income individuals [48] as they normally have less time for leisure as well as fewer safe areas or available resources to exercise [48, 49]. Therefore, funded sport programs may be an effective strategy to contribute to increasing PA participation and vigorous LTPA in this population group. In addition, public parks/spaces can be an important resource for the promotion of LTPA in low income individuals [48]. Significantly, a Brazilian study has reported that some population groups living in low SES communities are less engaged in LTPA than others. This applies, for instance, to female population [49]. Thus, females from low SES communities may need special approaches for sport/PA interventions given they seem to experience more barriers than men to engage regularly in PA [44, 50].

2.2.2. Physical Activity, Health and Women

As it was argued above, poverty is a significant barrier to achieving positive health outcomes; nevertheless, poverty tends to have a higher burden on women and girls' health given the social, cultural and economic factors that typically disadvantage them [51, 52]. The unbalanced power relationship between women and men, lower levels of education and limited paid employment opportunities in comparison to men, the strong focus on women's reproductive roles, and their experience of physical, sexual and emotional violence, are just some of the socio-cultural and economic factors that have great influence on women's health [53]. Furthermore, socio-cultural and economic inequalities as well as unbalanced access to resources, including health care, result in a higher burden of non-communicable

diseases (NCDs) among women across the globe [54].

Importantly, the increasing of NCDs rates in the worldwide population is strongly connected to physical inactivity [55, 56]. Research suggest that regular PA is effective in preventing NCDs such as diabetes, cancer, hypertension, obesity, depression and osteoporosis, and that there is a linear relation between PA and health status [57, 58].

In order to stimulate participation in PA among Americans, a public health recommendation on the types and amounts of PA necessary for health enhancement and disease prevention was published by the American College of Sports Medicine and the Centres for Disease Control and Prevention [59]. Today, these guidelines are internationally recognised and validated by many researchers [60, 61, 62], international health institutions, [63, 64], as well as national health departments [65]. However, Haskell et al. (2007) point out that many years have already passed since the recommendation of the American College of Sports Medicine and the Centres for Disease Control and Prevention was issued and the PA patterns of the world population has changed minimally [62]. According to Haskell and his colleagues:

“New science has added to our understanding of the biological mechanisms by which physical activity provides health benefits and the physical activity profile (type, intensity, and amount) that is associated with enhanced health and quality of life. The intent of the original recommendation, however, has not been fully realized. Physical inactivity remains a pressing public health issue (p. 1082) [62]”.

As an example of the low engagement of society in PA and sport, Pate et al. (2005)'s study points out that many American adolescents fail to meet national guidelines for PA and among this group obesity is prevalent. Furthermore, the authors emphasize that in the United States PA rates decline during high school years and are especially lower among adolescent girls [66].

Significantly, research and health reports worldwide have constantly asserted that women are less physically active than men during leisure time [65, 67, 68]. However, Fullagar (2003) argues that the scientific and political discourses about active leisure take into account the masculine experiences of LTPA as the norm for being healthy [69].

In order to understand the barriers and motivation for engagement in LTPA, Allender,

Cowburn and Foster (2006) analysed 24 qualitative studies to provide clues as to why the UK population do or do not participate in sport and PA [70]. Specifically, their research findings suggest that the management of weight, the development and maintenance of social networks as well as positive experiences in PE class were reported as important contributors for participation in LTPA and sport among girls and women; however, a masculine orientation of PE classes and organized or semi-organized sports were reported as important barriers for their participation in LTPA and sport [70].

A study conducted by Kilpatrick, Hebert and Bartholomew's (2005) compared motivations for sport participation and exercise among college students in the United States. Their results indicate that weight management and enjoyment are very important factors for exercising and practicing sport among female college students [71]. Another study conducted in the USA shows that childhood has a great influence on predicting participation in LTPA and sport in later life among college women [72]. Giuliano, Popp and Knight's (2000) study indicates that women's lower participation in sport can be attributed to childhood play activities, and therefore, the authors suggest that playing with masculine toys and games in male or mixed-gender groups leads to an increased likelihood of sport and LTPA participation [72].

In addition, a variety of social and cultural contexts seem to impact on women's participation in LTPA; nevertheless, these contexts have been frequently neglected in public health discourses [69, 73]. For example, women with young children have been often described as a population group with one of the lowest levels of LTPA, and therefore, at high risk of weight gain and postnatal depression. However, the public health recommendations of active living do not take into account, for example, how society's expectation of women/mother's roles and the discourses of the "ethic of care" and "good mothers" constrain the participation of women with young children in LTPA [73].

Besides, indigenous women living in remote rural communities report shame of performing LTPA and using sport clothes, household and family duties, and the lack of sport facilities and programs as impediments for being regularly physically active [74]. Therefore, Macdonald, Abbott, Jenkins (2012) argue that the perspectives of this population group concerning the body, familial obligations, and the provision of, and access to, active recreation as well as their living context, are inconsistent with Western notions that engaging in LTPA is merely a lifestyle choice [74].

A study with Latina women living in the USA shows that child-care responsibilities, household obligations, physically tiring occupations, long work hours, low income jobs, lack of affordable sport resources/sport activities are the most reported barriers experienced by this population group to engage in out-of-home LTPA as well as organized activity classes. Therefore, to increase LTPA in this group would be necessary promoting LTPA that takes place at home or in its vicinity, with little outlay of resources, and that can be undertaken in-between household obligations [75].

The above mentioned obstacles faced by women to engage regularly in LTPA, are only some examples of the broader socio, cultural, economic and political inequities experienced by women that limit their LTPA participation and consequently impacts on their health.

2.3. Physical Environment & Leisure Time Physical Activity

In the context of high rates of physical inactivity worldwide [76], many researchers indicate that not only individual choices impact on levels of PA, but also environmental and policy contexts have a great influence on the adoption of a healthy lifestyle, including regular and sustainable LTPA participation [77, 78]. Consequently, some studies have focused on assessing the influence of the built environment on levels of PA [79-84].

Physical activity resources (PARs) within park boundaries are settings able to provide a variety of recreation activities for different population groups, including families, children, and the elderly as well as institutions, such as schools and faith-based organizations. In America, parks and recreation facilities are provided by governments and they are generally accessible and available at low user cost to the population, and therefore have been positioned as important tools for increasing participation in LTPA and preventing NCDs [85].

A systematic review focused on European studies which assessed the impacts of the built environment on PA revealed that in Europe five environmental factors have a positive correlation with different PA domains (i.e. household PA, occupational PA, TRPA, and LTPA). Walkability was positively related to total PA (i.e. all four domains) and TRPA; access to shops/services/work to TRPA (walking and cycling); safety from traffic with LTPA (walking and cycling); degree of urbanization revealed a positive relationship with transportation cycling; and quality of the environment was positively related to total PA [86].

Some researchers have focused on the characteristics of the neighbourhood of residence and their impact on PA behaviour of the local population [87, 88]. Results indicate that living in a more walkable neighbourhood increases the adoption of the habit of walking as active recreation [89]; living in neighbourhoods with specific built environment characteristics (i.e. street connectivity, destination accessibility and residential density) is positively associated with TRPA and LTPA outcomes [90]; and individuals who live in active living-oriented zoning present significantly lower probability of no LTPA [91].

However, it is important to highlight that the built environment conducive to LTPA engagement is not equally distributed across society and results indicate that PARs are less available in low SES and minorities neighbourhoods [92-94]. Importantly, despite some studies reporting no direct relationship between the availability of parks or PARs and neighbourhoods' SES [95-97], the existent recreational facilities in low SES communities have been constantly reported as being of low quality [95, 98, 99, 100]. Furthermore, research has shown that not only the availability and quality of parks and recreational facilities play an important role on LTPA participation of individuals living in these areas, but also the high rates of vandalism and criminality [100, 101].

Significantly, the environmental changes necessary for hosting large scale sport events have been recognized by government agencies and event organizing committees as a great opportunity for increasing the number of PARs and enhancing health quality through sport participation [102, 103, 104], particularly in low SES neighbourhoods [104]. However, there is still a dearth of empirical evidence to support this claim [105, 106, 107], and therefore a discussion about the sport legacies of the Olympic Games is of great value and it will be the next focus.

2.4. The Olympic Legacies

2.4.1. Discussing the Olympic Legacies

The Summer Olympic Games is the biggest multi-sport event worldwide concerning the number of participants, media coverage, sport infrastructure and sponsors involved [108]. For the Olympic movement, the financial support of the private sector for the 1984 Los Angeles Games and the apparent success of these Games were important contributors motivating cities and countries around the world to apply again for hosting the Olympics, after the enormous financial problem faced by Canadians post the 1976 Montreal Olympic

Games [109]. After the introduction of commercialization and involvement of sponsors in the management of the 1984 Los Angeles Games, as well as new technologies in media coverage, the Olympics was resurrected and revitalized [109].

According to Dyreson & Llewellyn (2008) the Los Angeles Games left a powerful legacy for the Olympic movement, inventing the modern bid process, perfecting the Olympic village concept and marrying the Olympic Games to the modern entertainment industry thus turning it into a great spectacle [110]. The authors also assert that Los Angeles saved the Olympics from the perils of the Great Depression, the chaos of the Cold War and “americanized” the Olympics, and, as consequence, after 1984, the number of candidate cities for the Olympics rose dramatically [110].

However, despite of the growing involvement of private sector in supporting issues regarding to host the Olympics, the Games have still been mostly funded by local and/or national governments, with public money being constantly required for building sport venues and improving infrastructure, such as transport system and security [111]. In addition, Preuss (2004) asserts that the billions of dollars spent to stage an Olympic Games edition, covering all investment in the required sports venues and infrastructure, is too high for a host city/country. The author also argues that the ongoing gigantism of the Games raises questions as to whether the predicted legacies or benefits delivered by the Olympics justify the often hidden and unforeseen costs [112].

Importantly, in order to justify the large amounts of public investments in a sport event, organizers, governments and the International Olympic Committee (IOC) emphasize the benefits of hosting the Olympic Games for the host city and country [103, 104, 113, 114]. Despite the euphoric narrative of organizers supporting the various positive Olympic legacies, and the increasing number of candidate cities justifying their bids as an important opportunity to develop the city or region through increasing in tourism sector, employment generation, urban developments and changes in the images of the host city and country, the concept of the Olympic legacy remains vague and covers so many different aspects (i.e. social, economic, educational, environmental) that until to date there is no objective conclusion concerning the broad impact of the Olympic Games [115]. Furthermore, Thornley (2012) asserts that in terms of the Olympic legacies, promises concerning social and public benefits have often not materialized [115].

Leopkey & Parent (2012) highlight that the current importance of legacy within sport events has enhanced the interest of the legacy concept for various Olympic Games stakeholders such as the IOC, host cities, and governments who have financed the Games [116]. In this context it is important to note that the introduction of the word legacy in the Olympic charter as one of the mission and role of the IOC, in 2003, has reinforced the rhetoric that leaving positive impacts is an official concern of the IOC [117].

2.4.1. The Olympic Legacies History

Discussion about the Olympic legacies has recently appeared in academic and public spheres, the media and in IOC meetings. For Brownill, Keivani and Pereira (2013) it could be argued that the term legacy is part of the modern Games since Pierre De Coubertin, the founder of the modern Olympics, declared their aim to stimulate the athleticism and ambition of future generations [118]. However, according to the authors, it was only in the twenty first century that the term legacy has appeared in the Olympic agenda as a rationale for hosting the event. Furthermore, they highlight that the notion of the Olympic legacies has become more prevalent since the mid-1990s when images of empty stadiums post-games started to raise questions about the economic and environmental costs of such mega-events and the real benefits for the local population [118].

Tomlinson (2014) suggests that the term legacy was firstly reported in an IOC minute at the IOC meeting on 25-26 July 1984 in Los Angeles and it was mentioned by Frank King, chairman of the Organizing Committee of the 15th Winter Olympics at Calgary, who asserted that the objective of the Calgary Winter Olympic Games was to provide the greatest participation of athletes, spectators and officials, as well as to leave a legacy of Olympic facilities fully paid [119]. According to the author, the statement from King matched very well with issues addressed in the IOC session of the previous day, when the discussion focused on the need of strengthening the social forces to bridge gaps and to bring people together. Furthermore, the author also adds that the words ‘participation’ and ‘legacy’ now dominate Olympic bidding and planning discourse [119].

Brownill, Keivani and Pereira (2013) indicate that the word legacy is a fluid and contested concept that provides a variety of interpretations and in political debates and actions the term is not clearly defined in regards to its conceptualization and realization [118]. While the discourses of politicians, stakeholders and members of the IOC and

Nationals Olympic Committees emphasize the positive legacies of the Olympics Games, researchers are not so optimistic when describing the legacies delivered by the Games [118]. For Tomlinson (2014), the uncontrollable and recurrent increasing of costs to stage the Olympics has made necessary the appeal to legacy narratives [119].

Despite the Olympic Charter describing legacy as a goal of hosting the Olympic Games and the planned legacies being one of the criteria for bids' evaluation, there are no clear definitions of legacy in the bid documentation [118].

Significantly, the candidacy for the 2012 Olympic Games was the first time that an Olympic legacy plan was officially required for the candidate cities [118]. More specifically, according to Mansfield, Weed and Dowse (2010), the London 2012 Olympic and Paralympic Games were the first Games that planned to deliver a sport and PA legacy, therefore being the first time that direct strategies to enhance population levels of sport and PA were mentioned in an Olympic bid [120].

Despite the narratives of sport legacies being delivered for the whole British population, Mansfield, Weed and Dowse (2010)'s findings suggest that the Games have the power to inspire more sports-oriented people than non-sport participants. Therefore, the authors highlight that non-physically active individuals being inspired by elite athletes or sport events is more a political and ideologically-based assumption than evidence-based assertion [120].

2.4.2. The Sport and Health Legacies of the Olympic Games

Recently, researchers across the globe have paid particular attention to discussing the sport and health legacies of the Summer Olympic Games [109, 121, 122, 123, 124, 125, 126], one of the most promoted Olympic legacies of the London 2012 Olympic Games, as well as, one of the four legacies commitments of the Rio 2016 Olympic Games [104,121].

Lately, the rhetoric of the positive impacts of the Olympics on host population's health through increased sport and PA participation has been frequently present in the IOC and National Committees' documents [103, 104,114]. Importantly, the sport legacy statements made by these bodies seem to suggest that being a host city of the Olympic Games is sufficient to help the local population improve their health and well-being through increasing the motivation to participate in sport and PA. In other words, they promote the 'trickle-down' or demonstration effect of the Olympic Games as a guaranteed consequence

of hosting the Games without any empirical evidence to support such claim [107, 125, 129, 130].

Significantly, Weed et al. (2009) highlight that despite the lack of empirical evidence supporting that the Olympic Games and other sport mega-events can enhance sport and LTPA participation and contribute to health improvement through engagement in sport and LTPA, this does not necessarily mean that sport mega events are not able to leverage sport and PA participation and consequently improve the health condition of local population [107].

After reviewing in depth the literature regarding sport policies, LTPA/sport participation in disadvantaged groups, and the Olympic legacies, the next chapter will present the the objectives of the four empirical studies developed for this thesis.

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CHAPTER 3

PhD research objectives

As part of the bidding project for hosting 2016 Summer Olympic and Paralympic Games in Rio de Janeiro, the Brazilian government and the Rio de Janeiro city council made commitments to deliver long-term improvements for the city's residents. These promised benefits extended from infrastructural projects like transport and facilities to residents' health and well-being. Specifically, the health benefits of the 2016 Olympic Games were reported as the Games being a special opportunity for increasing physical activity (PA) participation among Rio de Janeiro residents, through improvements in national and regional policies as well as other interventions. Based on the gap in knowledge of the impact on sport participation and health legacies of the Olympic Games among low socio economic status (SES) residents of host cities, the aims of this thesis were as follows:

Background of study 1: Brazil has recently been successful in attracting sport mega-events. In 2007 Brazil hosted the biggest multi-sport event in the Americas, the Pan American Games, followed by the 5th CISM (International Military Sports Council) Military World Games in 2011, the FIFA Confederations Cup in 2013, the 2014 FIFA World Cup and the 2016 Summer Olympic and Paralympic Games. All of these sport mega-events have Rio de Janeiro as at least one of their host cities. As a result of attracting these events, sports in general have been at the centre of many Brazilian government actions, while an increase in participation in sport and PA has been specifically identified as a key benefit of hosting the events.

Aim of study 1: Within the context above mentioned, the aim of the study 1 was to discuss how the Brazilian government has been delivering sport and PA opportunities to Brazilian society, and the extent to which people are benefitting from the current scenario of increased government interest in sports. More specifically, the main objective of study 1 was to identify to what extent low SES communities have gained a sport and PA participation

benefit from the plans to host sport mega-events in Rio de Janeiro. Importantly, the aim of study 1 was to provide an initial discussion of the sport policy context of Cidade de Deus neighbourhood, Rio de Janeiro/Brazil, with its results expanded in the following studies.

Background of study 2: Researchers worldwide have suggested that environmental and policy contexts can play an important role in the adoption of healthy behaviours. Therefore, many scholars have tried to assess the influence of the built environment on levels of PA and their findings indicate that the built environment is indeed an important predictor for PA engagement. An important issue regarding built environment and leisure-time physical activity (LTPA) practice in the Brazilian context refers to the environmental urban regeneration necessary for hosting large scale sport events (i.e. the 2007 Pan American Games and the 2016 Olympic Games) which has been considered by Brazilian government agencies and event organizing committees as a great opportunity for enhancing the number of physical activity resources (PARs) and improving health quality through sport participation, mainly in low socio-economic status (SES) communities.

Aim of study 2: In this context, the main objective of study 2 was to evaluate and discuss the quality of public PARs available in a low SES community (Cidade de Deus) in the Olympic city of Rio de Janeiro. Therefore, the aim of study 2 was to provide an overview of the built environment available in Cidade de Deus neighbourhood conducive to LTPA practices and one of the intentions in conducting this study was the possibility to expand the results of study 1.

Background of study 3: In Brazil women are significantly more sedentary than men during their leisure time. Furthermore, socioeconomic and educational levels have been reported as important demographic characteristics that have a great influence on levels of LTPA in the country's population. Importantly, in recent years the Brazilian governments have strongly supported the hosting of sport mega-events and have claimed that it is an important strategy for changing the PA behaviour and consequently to improve the health of the Brazilian population. However, there is still a dearth of empirical evidence which demonstrates that sport mega events impact on PA and sport participation at the population level.

Aim of study 3: Thus, in order to discuss the PA levels, and therefore, the PA behaviour, of those who have been constantly reported in national health reports as well as in national research as those who are less likely to engage in LTPA, the aim of the study 3 was to analyse the current PA patterns of women living in the low SES community of Cidade de Deus, which is in close proximity to the 2016 Olympic park. Furthermore, the aim was to further discuss the impacts of the 2016 Olympic Games on sport/LTPA participation legacies and in this study the focus were the individuals instead of the sport/LTPA policies or facilities.

Background of study 4: Public health discourses worldwide have constantly emphasized both the importance of PA for health improvement as well as the damaging effects of physical inactivity. Therefore, a special focus of health promotion efforts has been on LTPA. At a structural level, sport mega-events have been claimed to contribute to increasing participation in LTPA among host residents. Significantly, there is still a gap in knowledge of how low SES communities have been impacted by these events and by the health promotion discourse associated with them.

Aim of study 4: To reduce the above mentioned gap in knowledge, the aim of study 4 was to discuss the sport/LTPA participation legacies of the Rio 2016 Olympic Games as perceived by residents of a local low SES community. In particular, this study focused on how women living in Cidade de Deus have perceived the impacts of the 2016 Olympic Games on their and their community's health and sport/LTPA participation levels. For instance, the aim of this study was to give voice to the women from Cidade de Deus and, therefore, expose their point of views about the sport/LTPA policies and facilities available in the community and well as their explanations about the meaning of sport/LTPA in their lives.

CHAPTER 4

Methodology

4. Methodology

4.1. Social Ecological Theory

This study adopted a social ecological approach to discuss the impacts of the 2016 Olympic Games on health and physical activity (PA) behaviour of women living in Cidade de Deus (further information about the community is provided in section 4.5 – Study Site), a low socio-economic status (SES) community in the Rio de Janeiro city. Importantly, the major assumption of the social ecological theory is that human behaviour, such as being regularly physical active, is influenced not only by individual's choices, but also by his/her social, economic, cultural, political, geographic and environmental contexts [1-4].

According to Lounsbury & Mitchell (2009), the psychologist Kurt Lewin (1890-1947) was the pioneer of the social ecological theory, defining that human behaviour is shaped by a relationship between the individual and his/her environment in a specific place and time [5]. Following Lewin's approach to the study of human behaviour, Bronfenbrenner (1977) adds that to understand human development/behaviour it is necessary to observe more than individual(s) behaviour in a specific setting. It is important to investigate the multi-settings where individual(s) is/are embedded, since human development/behaviour is affected by relations with and between the immediate settings as well as by the larger social context where the settings are located [6]. For Lounsbury & Mitchell (2009) the most important contribution of Bronfenbrenner to social ecological theory is his ecological systems theory, which is symbolized by the figure of concentric circles that represents four types of systems: The microsystem (the immediate setting where an individual is living, studying or working in); the mesosystem (two interacting microsystems; e.g., home and workplace); the exosystem (external environments that indirectly affect the individual's development/behaviour, e.g., the mother's place of work); and the macrosystem (the larger

socio-economic cultural context) and inside of this all systems is/are the individual(s), active agent(s) who is/are able to influence and to be influenced by the systems [5-7].

According to many scholars, in the past three decades, interest in ecological theories and the application of ecological models have dramatically increased among public health and health promotion researchers and interventionists [3, 8], and it has been partially caused by the more holistic approach of ecological theories/models to investigating and planning changes in population's behaviours that can reduce serious and prevalent health problems [3]. Additionally, Sallis, Owen and Fischer (2008), highlight that ecological theories/models distinguish themselves from behavioural theories/models because the former consider the impacts of individual characteristics, skills, proximal social influences (e.g. family & friends) as well as the broader community, organizational and policy influences on health behaviours, and therefore, they enhance human dignity moving the explanations of harmful health behaviours beyond individual responsibilities [3].

Furthermore, Grywacz & Marks (2001) argue that more than attenuating the possibility of victim-blaming, the ecological approaches can also contribute for a more sustainable change in individual and population health behaviour [9]. For instance, ecological models posit that enhancing environments is more beneficial than change in individual behaviour, once improving the environment can affect many individuals [10].

Recently, ecological approaches such as the social ecological theory have been applied worldwide by researchers who investigate the multiple factors that influence PA behaviour. For example, Fleury & Lee (2006) applied the social ecological model in their literature review to better understand the PA behaviour of African American women and have concluded that this theoretical approach is an important tool to guide PA intervention in this population group [11]; Nanayakkara (2012) used the social ecological theory to evaluate personal, societal and historical influences on the PA patterns of South Asian women [12]; Zahng, Somon, Gao and Kosma (2012), based on the social ecological approach, examined the influences of individual (barrier self-efficacy), social environment (support from parents, friends and physical education teachers), and physical environment (equipment accessibility, neighbourhood safety) on PA behaviours among middle school students in the United States [13]; Derom, VanWynsberghe & Scheeder (2015) have applied the health promotion concepts of systems (key element of the social ecological approach) in

the case of the Tour of Flanders to investigate how leveraging efforts can enhance PA participation [14].

This thesis was also based on social ecological approach. It investigates the different contexts/systems where the research participants are embedded and how these contexts/systems may have impacted on their PA behaviour, beliefs of healthy lifestyle, and perceptions of PA opportunities. In order to achieve its aim, this study concentrated its attention within three different systems (see figure 4.1 below): The macrosystem (the 2016 Olympic Games and its health and sport/PA legacies discourses and commitments), the exosystem (the Brazilian sport policies and programs), the microsystem (the community of Cidade de Deus and its PA resources). Specifically, this study assessed how the health and sport/PA legacies discourses/commitments of the 2016 Olympic Games promoted by Brazilian governments, Games' organizers and stakeholders have impacted on the sport policies available in the community of Cidade de Deus and the quality of PA facilities in this neighbourhood.

In this thesis, the macrosystem is represented by the health and sport/LTPA legacies discourses/commitments of the 2016 Olympic Games and it was discussed in all 4 studies. A particular investigation was conducting on the exo and micro-systems. For instance, the study 1 examined the sport/PA policies and programs available in the Cidade de Deus neighbourhood, and the study 2 assessed the quality of PA resources existent in this community. After investigating the political and physical environment available in the Cidade de Deus community, this thesis focused its attention on the individual level, and therefore, an investigation of the PA behaviour/pattern of women living in Cidade de Deus was conducted as well as an assessment of their perceptions of the impact of the 2016 Olympic Games on their health and sport/PA participation. In order to achieve the objectives of this thesis, quantitative and qualitative data was collected and analysed, that is, this study adopted a mixed-methods approach which is explained in the section 4.2. Mixed Methods.

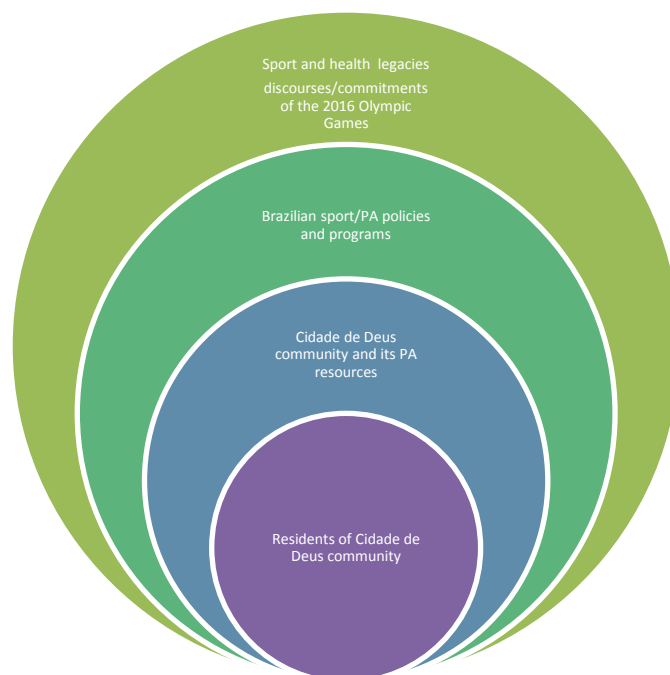


Figure 4.1: Ecological model of the health and sport/PA legacies of the 2016 Olympic Games in Cidade de Deus residents.

4.2. Mixed-Methods

4.2.1. Definition of Mixed-Methods

Mixed methods research is an approach that intentionally combines at least one qualitative and one quantitative method in a single study [15-17], attempts to consider multiple points of view, perspectives, positions, and standpoints (i.e. including the standpoints of qualitative and quantitative research) [18], has been developed as a viable alternative to quantitative and qualitative paradigms [19], focusing on research questions that call for real-life contextual understandings, and frames the investigation within philosophical and theoretical positions [15]. In addition, Bergman (2011, 2008) argue that the mixed methods research offers important advantages compared to the use of monomethod research and they are: Cross-validation or complementation of individual findings, the combination of different strands of knowledge, skills, and disciplines and the possibility of bringing the individual researcher into the centre of research activities [16, 20].

Importantly, Johnson, Onwuegbuzie & Turner (2007) assert that there is not yet a perfect or essentialist definition for mixed methods research, and therefore, they argue that dialogue and social construction of a workable definition is a worthwhile goal for this field, however, researchers have to keep in mind that definitions can change over time as the mixed methods approach or paradigm continues to develop [18].

Significantly, in the last 30 years mixed methods research has increased its popularity in the social, behavioural and health sciences [15, 16, 18, 21] and it has been recognized by many scholars as the third major research approach or research paradigm [17-19]. Despite its wide recognition and successes in academic and other types of research, many controversial issues and debates have limited the widespread acceptance of mixed methods research [20, 21].

For instance, the “paradigm-method fit” issue and the “best paradigm” issue have contributed for the debates concerning the philosophical basis of mixed methods research [21]. Regarding the “paradigm-method fit” issue Hanson and colleagues (2005) explain that many researchers have argued that postpositivist philosophical paradigm, or worldview, could be combined only with quantitative methods as well as naturalistic paradigm only with qualitative methods, and therefore, mixed-methods research is unacceptable since certain paradigms and methods cannot “fit” together, while other researchers have advocated that different philosophical paradigms and methods are compatible, once that not all quantitative procedures are objective and not all qualitative procedures are subjective, and therefore, the both methods should be mixed [21]. Furthermore, some scholars have supported the use of multiple methods in a single study to take advantage of the representativeness and generalizability of quantitative results as well as the in-depth and contextual nature of qualitative results [22, 23].

Concerning to the “best paradigm” issue, Hanson and colleagues (2005) recognize that are multiple philosophical paradigms that have been advocated as the best foundation for mixed methods research [21]. However, they present in their study only two different perspectives, for instance, the dialectical and the pragmatic [21]. The first perspective supports that mixed methods research have intentionally used competing paradigms (i.e. qualitative and quantitative paradigms) and have attributed each of them equal merit. Additionally, the supporters of this perspective claim that mixed methods should be viewed strictly as a method and that the most appropriate paradigm should be determined by the researcher and the research problem and not by the method. The pragmatic perspective is based on a set of ideas that advocate the use of diverse approaches, using “what works” and valuing both objective and subjective knowledge in one study [21]. This perspective has been recognized by many scholars as the most appropriated paradigm for mixed methods research [17, 18, 23, 24].

Interestingly, researchers worldwide have suggested different purposes for using mixed methods. For example, Johnson et al (2007) assert that mixed method approach should be used when the research question(s) and the study context, suggest(s) that this method is likely to provide superior research findings and outcomes [18]. Hanson and colleagues (2005) have indicated that a mixed methods investigation may be conducted to: “(a) better understand a research problem by converging numeric trends from quantitative data and specific details from qualitative data; (b) identify variables/constructs that may be measured subsequently through the use of existing instruments or the development of new ones; (c) obtain statistical, quantitative data and results from a sample of a population and use them to identify individuals who may expand on the results through qualitative data and results; and (d) convey the needs of individuals or groups of individuals who are marginalized or underrepresented” [21, pp. 226].

Some authors argue that triangulation, complementarity, development, initiation and expansion are the five main purposes of mixed methodological studies [15, 21, 23, 25]. For instance: 1) triangulation means that a researcher is using a mixed methods approach to seek convergence and corroboration of results from different methods; 2) complementarity happens when the researcher intends to elaborate, enhance, illustrate and/or clarify the results of one method with the results from the other method; 3) development is the use of the results from one method to help inform the other method; 4) initiation happens when using one method results in discovering paradoxes and contradictions which lead to a re-framing of the research question; and 5) expansion is when the breadth and range of inquiry is expanded by using different methods for different inquiry components [23]. Depending on the purposes for using the mixed methods approach, the mixed methods design needs to be different and these differences is presented in the next section.

4.2.2. Mixed-Methods Design Approaches

There are many different ways to design a mixed methods study, but there is no rigid formula for that. Many authors have presented distinct possibilities for designing a mixed methods study. According to Creswell, Klassen, Plano-Clark & Smith (2011) to design a mixed methods study it is important to consider: 1) the philosophy and theory of the study, 2) the resources (time, financial, skills) available, 3) the research problem, and 4) the reasons for conducting a mixed methods study. The authors also highlight that mixed methods design may be fixed or emergent, that is, in a fixed design the methods are chosen before the

research process starts while in the emergent design the methods emerge during the research process [15].

Additionally, Greene (2008) suggests some key dimensions that are important to designing a mixed methods study and they are divided into primary and secondary dimensions [25]. The primary dimensions are: Independence/interaction (i.e. the qualitative and quantitative methods are mixed at the end or throughout the inquiry), status dominance (i.e. the priority or dominance of one method, qualitative or quantitative over the other), and timing (the different methods being implemented at the same time or sequentially) [25]. The secondary dimensions reported by the author are: Transformative intent (the presence or not of a political agenda in the inquiry), study (single study or cross coordinated studies), strands/phases (the different strands that are mixed in one study), and methods characteristics (the extent of differences in the methods being mixed) [25]. For some authors these dimensions represent some relevant characteristics that distinguish one type of mixed method from another [15, 26].

Importantly, researchers based on the existent differences in mixed methods study designs, propound to divide the mixed methods in types as follows: 1) Sequential explanatory, 2) sequential exploratory, 3) sequential transformative, 4) concurrent triangulation, 5) concurrent nested and 6) concurrent transformative [15, 26, 27].

- Sequential explanatory design the quantitative data is/are collected and analysed first followed by the qualitative, qualitative data is primarily used to expand the quantitative data, and the integration of data occurs at the data interpretation stage;
- Sequential exploratory design is when qualitative data is/are collected and analysed first then the quantitative data, quantitative data is used to extend the qualitative data and the data integration happens at the interpretation phase;
- Sequential transformative design has a theoretical or conceptual framework guiding the study, qualitative or quantitative data is/are collected and analysed first, followed by the other, data analysis is usually connected and integration occurs at the data interpretation phase;
- Concurrent triangulation design quantitative and qualitative data are collected and analysed at the same time, the priority is usually equal and the integration normally occurs at the data interpretation stage;

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- Concurrent nested designs the qualitative and quantitative data are collected and analysed at the same time and the priority is usually unequal, and therefore, the priority is given to the primary data collection approach, data integration usually occurs at the data analysis stage;
 - Concurrent transformative design the data are collected and analysed at the same time, the study is guided by a specific theoretical perspective, the priority may be unequal and given to one form of data or other and the integration of data usually occurs at the data interpretation stage [15, 26].

The mixed-method designs used for the purpose of this study is presented in the section 4.3. Study Design.

4.3. Study Design

This study was based on the pragmatic perspective of the mixed methods research and therefore applied diverse research approaches (i.e. case study, observational tool, questionnaire and interview) as well as considering objective and subjective knowledges as important strategies to disclose the influences of the health and sport participation legacies discourses/commitments of the 2016 Olympic Games on different dimensions of Brazilian society (public policy and built environment) and consequently, how this legacy discourse and its influence on Brazilian public policies and built environment have impacted on the PA behaviour and the perceptions concerning health and PA of women living in a low income community. By using the mixed methods approach in this thesis, the intentions were: to consider different perspectives of the research problem, to focus on and give value to the contextual and cultural understandings related to the research problem, as well as to combine different knowledges to have a large picture of the research problem. Furthermore, following Hanson and colleagues' suggestions for using mixed methods [21], this research approach has also contributed to communicate the needs concerning the health and PA of women from Cidade de Deus after analysing the questionnaire and interviews.

Based on the five purposes for using mixed methods approach proposed by Onwuegbuzie & Leech (2005) [23], this study conducted a triangulation, and therefore, the findings of the qualitative and quantitative inquiries were converged to better explain the research problem.

Importantly, this study adopted two mixed methods designs in order to answer all research questions. For the first phase of the study, when the Brazilian sport

policies/programs and the built environment (PA resources) available in the Cidade Deus neighbourhood were the focus of the investigation, the mixed methods design used was the sequential exploratory. In this phase the qualitative method chosen was a case study of the sport policies and programs available in Cidade de Deus and the quantitative method was the application of an observational tool to assess the existent PA resources in this community. In this stage, despite qualitative and quantitative data being collected at the same time (in 2012), they were collected by different researchers, the data collection instruments were different and they were analysed separately. The quantitative data was used to expand the qualitative information. The integration of both data collected happened at the interpretation stage and is presented in the chapter 9 of this thesis.

In the second phase of this study the mixed method design was the sequential explanatory, and therefore, the collection of the quantitative data was conducted first while the qualitative data was collected later with the objective of expanding the quantitative data. The quantitative method chosen for this phase was a questionnaire, the International Physical Activity Questionnaire (IPAQ) [28]. The quantitative data was collected in 2012 and the qualitative data (interviews) were conducted one year later. All methods used in this study are explained in the section 4.4. Study Methods.

It is important to highlight that a great number of authors have advocated the use of both qualitative and quantitative techniques for data collection in PA studies [29-32]. Following Mason (2006) and for the purposes of this investigation, qualitative and quantitative data production strategies were adopted in order to answer the different research questions posed. Thus, to organize the data, this thesis was divided into four studies (see table 4.1 below): (1) Case study, (2) observational tool (3) questionnaire, and (4) interviews.

The quantitative data collection strategy (i.e. observational tool and questionnaire survey) focused on the following question: (1) What is the quality of public PA resources available for low SES communities' residents in Rio de Janeiro?, and (2) What are the PA levels of women from a low SES community of Rio de Janeiro, when one considers occupational, household, leisure time and transport-related physical activities? These strategies involved the use of the direct observational tool named Physical Activity Resource Assessment (PARA – see Appendix A) [34], which assess the quality of physical activity

resources (PARs), and the Portuguese variant of the self-administered long format of the IPAQ (see Appendix B), which assesses the level and rates of PA in the daily life of an adult.

The qualitative component produced data in relation to the following questions: (3) How has the Brazilian government been delivering sport and PA opportunities/programs for low SES groups in the context of significant investments in sport mega-events?, (4) How have people living in a low SES community benefited from government investments in sport mega-events?, and (5) What expectations do women have for the 2016 Olympic Games regarding health and PA? These three questions were answered using the two qualitative data collection tools mentioned earlier, i.e. case study, focusing on the contents of official documents concerning public health and PA, personal experiences and observations, and interviews with women from Cidade de Deus a low SES community in Rio de Janeiro (Themes for the interviews – see Appendix C).

Table 4.1: Summary of research methods

Studies	Data collection method:	Collected data:	Research question:
Study 1	Case study	Sport and PA projects and programs available in Cidade de Deus neighbourhood and supported by the Brazilian federal government.	How has the Brazilian government been delivering sport and PA opportunities/programs for low SES groups in the context of significant investments in sport mega-events? How have people living in a low SES community benefited from government investments in sport mega-events?
Study 2	Observational	The quality of PARs in the Cidade de Deus	What is the quality of PARs in

	tool	community.	Cidade de Deus neighbourhood?
Study 3	Questionnaire	Women's demographic and health information; Levels of PA in women daily life.	What are the PA levels of women from a low SES community of Rio de Janeiro, when one considers occupational, household, leisure time and transport-related physical activities?
Study 4	Interviews	Social-demographic information; Representation of health Representation of PA Representation of women health Women lifestyle	What expectations do women have for the 2016 Olympic Games regarding health and PA?

4.4. Study Methods & Analysis

4.4.1 Study 1: Case Study

The first study of this thesis was based on case study methodology. Gerring (2011) define the case study approach as an intensive study of a single case with the objective of understanding a larger set of cases [35]. For this author, case studies is more useful when the research strategy is more exploratory than confirmatory, when for internal validity prevails over external validity, when insight into causal mechanisms has priority over insight into causal effects, when propositional depth is highly valued over breadth, when the research focus is on heterogeneous population more than homogeneous, when causal relationships are stronger, when useful information about key parameters is available only for a few cases, and when the available data are concentrated rather than dispersed [35]. Importantly, Baxter & Jack (2008) argue that case study methodology gives researchers

important tools which facilitate the investigation of complex phenomena within their real-life contexts [36] and Rule and John (2015) says that a contextually sensitive and theoretically astute case study may contribute to the development of new theory and not only to the application or revision of existing theories [37]. Additionally, Schwandt & Gates (2018) state that the four main purposes for using a case study design are: (1) Description, (2) hypothesis generation or theory development, (3) hypothesis and theory testing, and (4) development of normative theory [38].

The case study proposed in this thesis focused on the low SES community of Cidade de Deus and on the challenges and issues faced by its residents within the context of Rio de Janeiro being the host city of many sport events. The purpose of using case study in this thesis was to investigate a present-day phenomenon in its real-life context (Baxter & Jack, 2008) [36], for instance the availability of public funded sport/PA programs/projects in Cidade de Deus. In order to do so it was conducted a descriptive case study which the objective was to develop a detailed description of the studied phenomenon (Schwandt & Gates, 2018) [38]. This research was used as an opportunity to learn from a particular experience whilst acknowledging its specific contingencies, and therefore, no claim for generalisability of the study findings was made.

The focus on one particular location is justified by the specific nature of this study which was to investigate how effective is the accesses to public sport and PA projects/programmes in low SES communities in Rio de Janeiro. Taking into consideration that poverty, and its related issues, such as unemployment and low levels of education, has been associated with immobility in Brazilian cities [39] and that the lack of opportunities to engage in sports and PA close to home is a well-known reason for non-participation in sport and PA [40, 41]. Thus, concentrating the investigation in one low SES community (i.e. Cidade de Deus community) was indeed an important strategy to discuss the access of its residents to public funded sport and PA programs.

Normally, the case study utilizes particular types of evidences, for instance, ethnography, participant observation, fieldwork, textual or historical research [35]. The present study utilised a combination of personal experiences, observations and secondary data. For example, several visits to Cidade de Deus were conducted between April and July 2012 to disclose all public recreational areas and sport facilities located inside of the community borders; informal interviews took place with the community leader and other

key informants from the community and publicly available policy and planning documents from the websites of Brazilian ministries and departments formed a significant part of the sources used.

Significantly, the local leader contributed to the identification of all local recreational areas and PA facilities and he also explained the issues experienced by the community in accessing government-funded sport/PA and leisure projects. Furthermore, several visits were conducted to two local public schools, one church and to the local public health care unit. These visits provided a great opportunity to meet and talk with local residents, including sport instructors of past or present government sport projects/programmes, school teachers, young people, elders and other community members.

Importantly, visits were also made to the city council's local management department located in Cidade de Deus in order to get information about the recreational areas and sport/PA facilities and programmes that were available to residents. Despite the focus of this study being on projects/programs funded by the federal government, contact with public institutions which have a straight link with community's residents were considered important once that many federal sport/PA projects/programmes are conducted in partnership with state governments and/or local councils. Furthermore, national sport policies tend to have real impact on local policies and programmes.

The final stage of data collection in this study was to gather official information about sport and PA projects/programmes developed in low SES communities in Brazil and Rio de Janeiro and particularly in Cidade de Deus and they were available on the websites of Brazilian Sport Ministry, Brazilian Justice Ministry, Municipal Secretary of Sport and Leisure, Sport's Observatory, Civil House, Rio de Janeiro's City Hall, Municipal Olympic Company, The Fitness Studio in the Square, and Favelas' Observatory [42-55]. The information encountered on these websites is further described in chapter 5 of this thesis. After gathering the official information about sport and PA projects/programs, they were compared to those collected in the field work, for instance, the observations and conversations with local leaders and residents.

Concerning the social ecological theoretical approach chosen for this thesis, the study 1 was an important step to elucidate how Brazilian political environmental context, for instance, the context of great amounts of public resources being invested in hosting

international sport events in the last 10 years have impacted on government's delivering of sport/PA projects and programs for those living in low SES community.

4.4.2. Study 2: Observational Tool (PARA Instrument)

The study 2 used the Physical Activity Resource Assessment (PARA) instrument [34] which is a direct-observational tool that was conceived to systematically document and describe the type, size, accessibility, features, amenities and incivilities of a variety of physical activity resources (PARs) [56, 57]. Importantly, the PARA instrument has been used internationally and previous studies have shown that this check-list instrument has a good inter-rater reliability ($ks > 0.77$) [56-58].

The data for this study were collected between April and July 2012 by two trained researchers in the application of the PARA instrument. Specifically, this study used the PARA instrument to assess the quality of sport/PA facilities inside the Cidade de Deus neighbourhood. For instance, the features (presence of PA infra-structure, e.g. football field, basketball court, exercise stations), amenities (supporting structures such as drinking fountains, bathrooms and lighting) and incivilities (elements that can discourage the use of the space, e.g. graffiti, litter) of all 29 'praças' (i.e. PARs) in Cidade de Deus was assessed. In Brazil, praças are important and traditional PARs and they have been described as open built areas that provide a space for passive and active leisure, and commonly presenting some basic PA infrastructure [59].

The scores for all variables measured were achieved by applying PARA's guidelines for measurement: 13 features and 12 amenities were assessed on a scale from 0 to 3, where 0 = not present, 1 = poor, 2 = mediocre, 3 = good; while 12 incivilities are scaled from 0 to 3, where 0 = not present, 1 = little/few, 2 = some, 3 = a lot [34]. After that, to establish the quality of all 29 public PARs in Cidade de Deus, a Quality Indicator (QI) was calculated by summing the scores assigned to the features and amenities categories and subtracting the score generated by the incivilities category [60]. The possible minimum and maximum values for QI were -36 and 75 respectively.

A k-means cluster analysis technique was used to investigate the PARs' quality based on the three components assessed: features, amenities, and incivilities. The number of clusters to be used was determined by the between-clusters inertia-increase criteria. In cluster analysis, between-cluster inertia indicates the degree of separation between clusters; the higher the between-clusters inertia, the higher the cluster separation.

Following the social ecological approach study 2 was a relevant step of the research project once that this study analysed the characteristics and quality of the PA facilities available in Cidade de Deus, and therefore, it disclosed the quality of the built environment conducive to sport and PA engagement in this community. It is important to highlight that researchers worldwide have shown that the characteristics of the neighbourhood of residence impact on PA behaviour of the local population [61-63]. Thus, conducting an investigation of the characteristics and quality of the PA resources available in Cidade Deus was of great value to discuss the PA pattern of its residents.

4.4.3. Study 3: Questionnaire (IPAQ)

In the study 3 a questionnaire was administered. The IPAQ is an instrument for cross-national monitoring of PA and inactivity and was developed by an International Consensus Group in the World Health Organization (WHO) [64]. According to Craig and colleagues (2003), the IPAQ can be administered by telephone interview or self-administration, with two alternate reference periods, either the “last 7 days” or a “usual week” of recalled PA [64].

The IPAQ started to be developed in Geneva in 1998, extensive reliability and validity testing was undertaken across 12 countries (14 sites) during 2000, and the final results suggest that these measures demonstrate acceptable properties for use in many settings and in different languages [65].

In Brazil some research groups took part in the international efforts to validate the IPAQ proposed by the WHO [66, 67]. In 2001 Matsudo and her research team validated the Portuguese short and long version of the IPAQ in Brazilian population [68], and in 2010 Hallal and colleagues added that “the transport-related and leisure-time sections of the long version of the IPAQ/telephone-based interview provide a useful tool to correctly classify Brazilian individuals into different groups of physical activity level (high, moderate or low, for example)” [69, pp. 408].

Specifically, the long version of the IPAQ questionnaire in this study was used to collect data on the rates of PA in daily life of women from Cidade de Deus. Therefore, following the social ecological model adopted in the thesis, the collection of the levels of PA was an important step to understanding how the characteristics of the environment (political and physical) investigated in study 1 and 2, may contribute to explain the PA behaviour of research participants. Thus, answering the long version of the IPAQ information

of the PA in four different domains was assessed, for instance, occupational, household, transported-related physical activity (TRPA) and leisure-time physical activity (LTPA).

Additionally, the participants answered some open-ended questions which provided an expanded profile of the sample. Firstly, the participants were asked to describe their current job (e.g., cleaner, office worker, etc.) in order to better assess the relationship between occupation and PA. Furthermore, to analyze the relationship of economic conditions with PA levels, the participants answered questions about monthly income, number of people living in the same household, employment status, etc., were also included in the survey. Finally, in order to have a broader picture of the participants' health, the Portuguese version of IPAQ asked participants to self-report their health as good, regular or bad and in this study four questions were added and therefore the participants were asked to indicate whether they have or not been diagnosed with diabetes and/or hypertension and, if so, when they were diagnosed. The intention of these questions was to assess whether these pathologies, frequently associated with sedentary lifestyles, had an association with participating women's PA behavior.

In this study, the IPAQ was applied with the researcher's supervision through the adoption of a face-to-face interview approach. Thus, it did not exclude illiterate or semi-illiterate people because they could give answers orally. Furthermore, the Brazilian health ministry conducted an annual survey on risk factors for non-communicable diseases which include questions about PA behaviour and for that it uses a landline telephone method of data collection [70]. However, the coverage of telephone lines has been reported in Brazil as problematic [71], particularly in low SES communities [71, 72].

The data were collected by two trained researchers stationed in five different sites inside the community Cidade de Deus, for instance, two public schools, one church, the local public health care unit, and a non-government organization (for further information of the study sites see section 4.5). The data collection was conducted between June and July 2012, on different days of the week, from 9 am to 8 pm. Additionally, other participants were identified through the snowball sampling technique [73, 74], and were surveyed at their own houses, located in different areas of the neighborhood.

For this study 146 women were approached, 140 accepted to participate, but due to missing data only 135 were included in the analysis. The data of this study were processed following IPAQ's guidelines [28], and therefore, after cleaning the data, the total MET-

minutes/week spent in each PA domain (occupational, household, TRPA, and LTPA) was calculated for each participant. After that, the levels of PA were re-organized into two categories: insufficient level of PA (those previously classified in IPAQ's low level category) and sufficient level of PA (those presenting moderate or high levels of PA according to IPAQ's classification).

In order to facilitate the comprehension of factors related to PA, demographic data were categorized. Age was divided into three categories (young adults, older adults and elderly); educational level was divided into four categories ("up to primary school," "more than primary, up to secondary school," "more than secondary, up to high school," and "above high school education."); employment was organized in two categories ("employed" and "unemployed"); the marital status were combined into two categories (with partner and without partner); the monthly income responses were organized in four groups ("no salary", "less than minimum wage", "minimum wage", and "more than minimum wage")

All variables described above were used in a multiple logistic regression model, providing odds ratios (OR) and 95% confidence intervals (CI) for variables associated with "insufficient" versus "sufficient" levels of PA as the dependent variable (more details of data analysis is available in chapter 7).

4.4.4. Study 4: Interviews

The fourth study of this thesis adopted interviews as a research method approach. Employing this research method was an important strategy to understand how women from Cidade de Deus perceived health and PA in their lives, community's lives and in the context of living in an Olympic city, and therefore, how their health and PA perceptions may contribute to explain their PA behaviour and patterns. The interviews was the most intrinsic level of the social ecological model applied in this thesis and collected the most personal information of the research participants, for instance, their opinion and beliefs.

Importantly, by using interviews, it was expected to have access to people's subjective experiences and attitudes [75] as well as individual opinions and beliefs [76]. This study adopted a focused interview where a particular topic directed the discussion, for instance, health and PA. This research strategy allows researchers to gain specific information and explanations [77]. In particular, this study focused on individual assumptions with regard to health, PA and sport in the context of the Rio 2016 Olympic Games were investigated.

During the interviews, women living in Cidade de Deus answered questions about their needs concerning health and PA, described their health conditions and the community health situation, their PA behaviours and the possibilities of practicing PA in their community and share their expectations regarding the 2016 Olympic Games, the improvements concerning the existents PARs in Cidade de Deus, and the sport and PA legacies promised in the Rio de Janeiro's candidature file to host the 2016 Olympic and Paralympic Games [78].

A semi-structured interview schedule was prepared and tested prior to the meetings. Data were collected in July 2013 in Cidade de Deus community. A community member helped with the recruitment of an initial selection of 15 women aged 18 and over, residents of Cidade de Deus. Through the snow-balling technique [73, 74] other women were invited to take part in the study. In total, 34 women were invited and 30 accepted to participate. Participants were aged between 24 and 73 years, and were mostly long-term residents of the community (average of 32 years). Their professional status varied from students to small business owners, housewives, the unemployed, retired, and those working in informal services (e.g. street vendors).

The interviews were conducted and analysed in Portuguese. All interviews were recorded digitally, transcribed verbatim, and the relevant quotes translated into English for the purpose of this study. The first stage of interview analysis was conducted by one of the researchers involved in this study and it was based on the identification of main themes emerging from each of the focus areas (i.e. meaning of health; meaning of PA; expectations of changes in health and PA; Rio 2016 Olympic Games) of this study. After that, the second researcher revised the material, reading notes, quotations and transcript material, and a series of discussions and reinterpretations ensued.

The interviews were coded using a thematic content analysis approach (Fairclough, 2013) [79], and therefore, new themes was added to previously developed themes (i.e. focus areas). This coding procedure has conventionally been used for the classification of research data into categories [80], and serves as a starting point for discourse analysis [81]. A Foucauldian Discourse Analysis (FDA) was employed to analyse the coded data from interviews [82-84]. FDA is a research method that is interested in understanding language and its influence on the constitution of social and psychological life [84] and it mainly differs from other qualitative methods since its focus is on identifying and understanding how specific ideas are considered as 'truth' [83]. Additionally, Waitt (2005) argues that

researchers adopt a Foucauldian approach in order to examine how particular knowledges socially affect the ways that people think, perceive and do [83]. In this study, the FDA approach was used to discuss how power and knowledge [85] intrinsic to the international health promotion discourses of active living that was promoted by the stakeholders of the 2016 Olympic Games through the health and sport/PA legacies discourses, have impacted on the way that women from Cidade de Deus signifying the 2016 Olympic Games, perceiving their and their community health condition as well as sport/PA opportunities in their community, and meaning healthy life style. The results of this analysis are presented in chapter 8 of this thesis.

4.5. Study Site

The site chosen for this study was the Cidade de Deus neighbourhood and included one non-government organization (CEACC - Centro de Estudos e Ações Culturais e de Cidadania), two public schools (Escola Municipal Alphonsus Guimaraens and Escola Municipal Alberto Rangel), one church (Paróquia Cristo Rei) and the local public health care unit located.

Cidade de Deus is a low SES neighbourhood in the western region of Rio de Janeiro city and it is an area of 120,59 hectares [86]. This neighbourhood is the most populated low SES community located in the vicinity of the Olympic Park (circa 6km), and has experienced significant urban transformations in the recent years leading up to the Olympic Games in August 2016. The community has a population of 36,515 inhabitants with 53.5% being under 30 years of age, approximately 38% being adult females, and 63% of the households being led by women [87, 88]. However, many local leaders argue that the population of Cidade de Deus is bigger than officially presented, namely around 65,000 people [89] and significantly, Cidade de Deus ranks 26th in the Human Development Index for the 33 administrative regions within the city of Rio de Janeiro [88, 90].

One neighbourhood was sufficient for this study because the characteristics of low SES communities or favelas in Rio de Janeiro are very similar. However, it is important to note that those visible low SES communities close to the Olympic venues, airports, harbour and more touristic areas, may have experienced different impacts of the 2016 Olympic Games on their population.

Importantly, the majority of low SES communities' residents have low levels of education, unskilled and informal works, and therefore earning low salaries [91].

Furthermore, in low SES communities in Rio de Janeiro, specifically, and in Brazil in general, there is a lack of urban infra-structure, such as, garbage collection, sewage system, water network, electricity and public lighting [92]. More than the paucity of urban infra-structure, the low SES communities' residents also suffer with the scarcity or low quality of other essential public services, such as, schools, health care centres and transport systems [93-95]. For instance, in Cidade de Deus there is no high school, only one health care centre (opened from Monday to Friday and from 8am to 5pm) and one hospital for emergencies. The official public transportation available in the community is only the bus and these do not cross the neighbourhood, passing only in the main street or on the community's borders, and therefore, this transport system is not an easy access to the whole community.

In addition, other relevant problem faced daily by residents of Rio de Janeiro favelas is the high rates of violence in their communities which is related to armed confrontation between different drug gangs or drug gangs and police force [96-98].

4.6. Ethical Concerns

This study was approved by Southern Cross University's Human Research Ethics Committee (approval number: ECN-12-068; see appendix D). An information sheet (see appendix E) which informed the study participants of all the intentions of the research project was provided to all involved. Furthermore, a written informed consent (see appendix F) was obtained from all study participants prior to the survey and interview data collection. Concerning to the sites used for collecting data, a permission request (see appendix G) was required from the persons responsible for each of them.

Confidentiality was maintained throughout the research process and result dissemination. For instance, during the questionnaire data collection, instead of writing the names of participant women a code was used with the first letter of all their names and their date of birth. For the interview data collection, the women were asked to say their names, but during the dissemination of the results their names were replaced by fictitious names.

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CHAPTER 5

Public policies and sports in marginalised communities: the case of Cidade de Deus, Rio de Janeiro, Brazil

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Public policies and sports in marginalised communities: the case of Cidade de Deus, Rio de Janeiro, Brazil

Abstract

Significant economic development has been experienced by Brazilian society in recent years, leading to important changes in its social structures. The country's success in attracting sport mega-events, has resulted in the media increasingly portraying the current period as Brazil's "sport decade". This paper considers the phenomenon of sport participation in Brazil in the context of significant investments in sport mega-events. In particular, it considers how the Brazilian government has been delivering sport and physical activity opportunities for low socio-economic groups and the extent to which people living in a marginalised community have benefited from these developments. This involves an analysis of sport and physical activity projects and programmes supported by the Brazilian federal government in the community of Cidade de Deus, one of the most densely populated *favelas* in Rio de Janeiro. The area is located close to the Olympic Park, which will host most of the key facilities for the 2016 Olympic Games and so is a community that could be significantly impacted, positively or negatively, by the hosting of the event. The results of the investigation provide insights into the developments that have occurred in the provision of sport and physical activity opportunities to this marginalised community and the role public policies play in facilitating access to sport and physical activity.

Keywords: sporting mega-events; low SES communities; policy; leisure time physical activity

Introduction

Brazilian society has experienced significant economic development in recent years, leading to important changes in its social structures. However, these changes have not extended to the physical activity participation rates of the Brazilian population. Epidemiological studies conducted in the past 10 years consistently show that the Brazilian adult population has lower levels of leisure time physical activity (LTPA¹) compared to the levels reported for developed countries [1, 2]. In addition, recent research indicates that lower income and less educated individuals are even less active than the average for the Brazilian population as a whole [2, 3]. Indeed, Reichert, Barros, Domingues and Hallal (2007)

support this conclusion and show that lack of money was the most frequently reported barrier to engaging in LTPA among adult Brazilians living in southern Brazil [4]. In Rio de Janeiro, where the present study was conducted, LTPA participation levels are slightly below the national average, with 30 per cent of adults being physically active during their leisure time. All other features of the national participation patterns, such as the lower levels experienced by lower income individuals, are repeated in Rio de Janeiro [2].

In regard to participation levels in specific sports, data have not been systematically collected in the country thus far. The only (inconsistent and unsystematic) data available focuses on listing the number of sport facilities and services available [5, 6], providing a broad overview of the different sports practiced across the country [7] or indicating what sport “means” to the general population [8].

The available data, however, provide a good indication of current overall levels of engagement in LTPA in Brazil and the findings are consistent with similar studies in this field across different countries and cultures (cf. Cleland *et al.*, 2010; Day, 2006; Lioret, Maire, Volatier, & Charles, 2007) [9, 10, 11]. However, several studies conducted in different parts of Brazil, including in Rio de Janeiro, have demonstrated that the distribution of resources for the practice of LTPA is extremely uneven, with fewer resources provided in low socio-economic status (SES) regions and neighbourhoods and therefore less opportunities for residents of such areas to engage in sports and other physical exercise [12, 13, 14].

Parallel to the economic development of the last few years, Brazil has recently been successful in attracting sport mega-events, and the media are increasingly portraying this to be Brazil's “sport decade” [15]. In 2007 Brazil hosted the biggest multi-sport event in the Americas, the Pan American Games, followed by the 5th CISM (International Military Sports Council) Military World Games in 2011 and the FIFA Confederations Cup in 2013; and it has won the right to host the two largest sport events in the world: the FIFA World Cup in 2014 and the Summer Olympic and Paralympic Games in 2016. All of these sport mega-events have Rio de Janeiro as at least one of their host cities.

As a result of attracting these events, sports in general have been at the centre of many Brazilian Government actions, while an increase in participation in sport and physical activity has been specifically identified as a key benefit of hosting the events [16, 17]. This is therefore an area that has received, and will continue to receive, particular attention from different levels of government [16, 18, 19].

Within this context, the study presented here discusses how the Brazilian government has been delivering sport and physical activity opportunities to Brazilian society, and the extent to which people are benefitting from the current scenario of increased government interest in sports. More specifically, the main question addressed is to identify to what extent low SES communities have gained a sport and physical activity participation benefit from the plans to host sport mega-events in Rio de Janeiro.

As a purported focus of the Rio de Janeiro 2016 Olympic and Paralympic Games legacy programme [16, 17], the focus of the article is on mass participation in *leisure time physical activity*, which means that we are consciously leaving aside consideration of other forms of physical activity policy, such as incidental or work-related physical activity, and other dimensions of sport policy, such as elite sporting success or the economic impact of sport events.

The paper is divided into two main parts. The first part is concerned with public policy for sport in general and in Brazil, while the second comprises a case study of three federal government-funded sport projects/programmes currently or recently in operation in the low SES community of Cidade de Deus, and how they reflect the current national scenario in terms of promotion of sport and physical activity participation in the country more generally, and in Rio de Janeiro more specifically. A short summary of findings concludes the paper.

Public policy concerning sport and physical activity participation

Policies are actions structured by governmental, non-governmental and private sector organisations to achieve goals supported by specific strategies, frequently determining how the environment should be modified to obtain desired outcomes, and defining the responsibilities of involved actors, as well as the allocation of resources [20]. They are not merely decisions on particular topics/areas, but typically the final results of a series of negotiations between various stakeholders [21]. Public policy, in particular, refers to policy developed or enacted by governments at various levels. According to Schöppe *et al.* (2004, p. 7), “public policy is closely connected to people’s lifestyles because it sets the terms for individual choices. By the options it creates for institutions, groups and individuals it sets the bounds for what can be done” [20].

Public policies concerning the promotion of LTPA are increasingly seen as important to combat the trend towards increasingly sedentary lifestyles and their effects on health [22, 23]. More specifically, sport participation is frequently seen as a good investment by governments because it is believed that it can deliver additional benefits, such as increased social capital and improved mental health [24, 25]. However, as Coalter (2007, p. 36, emphasis in the original) states, “participation in sport (however defined) is a *necessary condition* to obtain any of the potential benefits”, although it might not be a *sufficient condition* [24]. Nevertheless, despite this belief in the potential benefits of increased levels of participation in sport and active leisure pursuits, there is still a dearth of quality research looking at the issues involved in policy making and implementation in this field [25].

Furthermore, it has been argued that, insofar as sport and physical activity levels can be influenced by public action, successful policies will require a mix of economic, social, educational and environmental components to be successful: narrowly sports-related policies will not be sufficient [20, 25]. In spite of this complexity, available resources have limited this study to consideration of public policies emanating primarily from what Nicholson *et al.* call the more traditional sport-focused areas of government. Any consideration of wider policy activity must await future projects and funding [25].

The Brazilian LTPA policy context

Sport and physical activity promotion has featured frequently in the Brazilian public policy agenda since the beginning of the twentieth century. Initially guided by eugenic and hygienist conceptions of physical activity [26], in the late 1930s, with the first military regime, the focus was on high performance sports, particularly football [27], as a source of diversion and spectacle for the population – the infamous “bread and circus” approach [28, 29].

Since then, Brazilian public policies for physical activity, recreation and sport have all been associated with, or been seen as a path to, high performance sport practice [26]. Not even the recognition of the *Sport for All* movement in Brazil during the late 1970s and 1980s was able to modify this scenario significantly. Despite the focus of this movement on reaching the masses, the *Sport for All* programme in Brazil, in some respects similar to other countries (see Coalter, 2007 for some discussion on this issue) [24], was utilised by the military government to reinforce an approach to civil society organisation and sport practice

focused on discipline and social control, utilising the power of high performance sport to promote the achievements of the country both domestically and internationally [30]. Unsurprisingly, this disciplinary focus did not induce the increase in mass participation in sports and physical activity which had been anticipated by the government of the time [31]. After the end of the dictatorship regime in the 1980s, a stronger link between sport and physical activity and health slowly started to be advocated by different segments of society [32].

Despite the historical developments which led to the continuing underlying emphasis on high performance sports, particularly at a public discourse level [26], the inclusion of sport and leisure as "social rights" in the Brazilian Constitution of 1988 provided a significant statement of recognition of LTPA. The problem, however, has been in developing policies to operationalise this constitutional right. In Brazil this has proven particularly difficult, with programmes and policies lacking continuity, with only short-lived benefits, lasting just long enough to provide numbers which look good in published reports [33].

Structurally, public sport departments at the federal, state and municipal levels are responsible for developing public policies, implementing sport/physical activity programmes and supporting sport events. The main source of policy guidance, funding and programmes is the federal government [34]. In particular, the Ministry of Sport, established in 2003, is the government department that has most influence on sport and physical activity participation promotion in the country, setting the agenda to be followed by state and municipal sport departments [31]. In 2005 the ministry launched the current *National Sports Policy* [31]. This document established policy approaches to high performance sports and to mass sports participation, making it evident that "the State continues to have a strong presence at all levels of sports activities in the country, as well as aiming to be at the forefront of sports events, by stimulating, promoting or coordinating them" (p. 356) [34]. The ministry's mandate includes a strong focus on LTPA participation, as indicated in Table 5.1 (see below). It is therefore the first "port of call" for the discussion and development of policies to increase LTPA participation.

LTPA policy in the "sport decade"

Since the second half of the 2000s, with all the major sport events being hosted and planned for in Brazil, and particularly in Rio de Janeiro, public investments in new sport

infrastructure, especially large sport stadia and facilities, have been ever increasing. Significantly, in the Rio 2016 candidature file [17], the newly constructed sports venues and supporting infrastructure are presented in the "Social Transformation through Sport" key strategy as facilitators of social change for youth and disadvantaged communities. The document refers to the role of "state-of-the-art" sport facilities in attending to the needs of disadvantaged communities, indicating that the planned Olympic Training Centre (OTC) "will support programs in its neighbouring communities to stimulate sports participation and healthy lifestyles, particularly among the disadvantaged and young people" (p. 23) [17]. These investments, however, are surrounded by controversy. Recurrent embezzlement complaints, issues of overspending and privatisation of publicly-funded infrastructure, accusations of creation of "white elephants" and claims that facilities will never reach the so-called disadvantaged communities are just a few of the issues raised by the Brazilian media, activist groups and academics [35, 36, 37, 38, 39].

Less apparent than the infrastructure investments are the public programmes and projects focused on LTPA, or the implementation of actions that are designed to bring sports and physical activity, if not to all segments of the population, then at least to those whose needs are deemed to be greatest. Although general mention of "programmes" is frequently found in the Rio 2016 candidature file [17], concrete examples are lacking. An increase in sport and physical activity participation is identified in the bid document as a key legacy goal for the Games, and both the Organizing Committee and the Brazilian Government commit to increase the reach of the *Segundo Tempo* programme (discussed in the case study below), and to invest in sport infrastructure in public schools.

In addition, the document elusively mentions a state-run programme titled *Rio Olímpico* which "will consolidate a number of existing initiatives to enable increased investment in new sport infrastructure and programs. The funding will also be used to promote sport participation and community access to games venues, helping thousands live their passion through sport" (p. 25) [17]. *Rio Olímpico* was first established in 2008, prior to Rio's successful bid, with the aim of detecting sport talent to potentially represent Brazil in future Olympic Games. It was then expanded in 2009, after the city was granted the right to host the 2016 Games, to encompass all projects that were being run either by the Rio de Janeiro State Government's Sport and Leisure Department or by the federal government's Ministry of Sport, as well as any future projects developed by either of these public agencies [40]. The

programme is therefore a legislative mechanism to facilitate funding flows from the federal to the state government to projects related to LTPA, and not a new initiative or a long-term plan to engage the population in sport and physical activity.

It is within this context of a lack of concerted and clear efforts from the government to deliver long-term strategies and programmes to increase participation in LTPA among the general population, and the current lack of a transparent plan to achieve the Olympic legacy promises of increased sport and physical activity participation, that this study analyses the extent to which low SES communities have benefited from the sport mega-events which have taken place since the mid-2000s and are currently being planned for in Rio de Janeiro.

Case study: leisure time sport and physical activity in Cidade de Deus

Methodology

The case study focuses on Cidade de Deus and on the challenges and issues faced by this particular community within the context of the city's "sport decade" [15]. The use of a case study is justified by our intention to analyse "a contemporary phenomenon in its real-life context" (p. 59) [41], but one which is nevertheless not clearly distinct from its broader social landscape. In choosing such an approach we make no claim for generalisability of our findings, but use this as an opportunity to learn from a particular experience whilst acknowledging its specific contingencies.

The focus on one particular location is justified by the very nature of the research project. As we are investigating issues related to access to public programmes of sport and physical activity in low SES communities in Rio de Janeiro, we need to bear in mind that poverty, particularly related phenomena, such as unemployment and low levels of education, has been associated with immobility in Brazilian cities [42]. Therefore, opportunities for residents of low SES communities to engage in sport and physical activity need to be in close proximity in order to be appealing and effective. The lack of opportunities to engage in sports and physical activity opportunities close to home is a well-known reason for non-participation [43, 44]. The limited geographical focus is therefore further justified.

Case studies commonly use evidence from "fieldwork, archival records, verbal reports, observations, or any combination of these" (p. 58) [41]. In the present study we utilised a

combination of secondary data, personal experiences and observations. Publicly available policy and planning documents from the websites of Brazilian ministries and departments formed a significant part of the sources used. All of these documents, apart from the Rio 2016 candidature file, are in Portuguese and their content is translated here where necessary.

Several visits to Cidade de Deus were conducted between April and July 2012. The researchers, accompanied by a local leader, visited all public areas and sport facilities located within the community. These spaces were identified by the local leader, who discussed at length the issues experienced by the community in accessing government-funded sport and leisure projects. Several visits were also conducted to one local public school and to the local public health care unit. During these visits the researchers had the opportunity to meet and talk with local residents, including sport instructors (several of whom were involved with past or present government sport programmes), school teachers, young people, elders and other community members.

Visits were also made to the city council's local management department located in Cidade de Deus to obtain information on leisure spaces and sport facilities programmes available to residents. Even though the focus of this paper is on projects funded by the federal government, some of these programmes are conducted in partnership with state governments and local councils. In addition, sport policies at the national level tend to have a significant impact on local policies and programmes and therefore communication with the public institution in immediate contact with the community was deemed important for our research purposes.

At the latter stages of data collection, official information about sport and physical activity projects/programmes developed in the community were compared to those gathered through our observations and conversations with local leaders and residents and inform our findings and discussions below.

The study context: Cidade de Deus

Cidade de Deus is located in the western region of the city of Rio de Janeiro. It was built in 1960 as part of a government programme of slum clearance in the coastal areas of the city. Slum residents were forcibly removed from their shanty towns to Cidade de Deus, where social housing was to be provided. However, most of the houses were not completed

by the time the families arrived in Cidade de Deus and the housing conditions remained as poor as their counterparts in the coastal zone. Further influxes of residents occurred over time and illegal constructions were built next to planned houses [45, 46]. Since then Cidade de Deus has expanded substantially and now has one of the highest population densities in the city, with a population of some 47,000 in a land area of approximately 1.2km² [47].

Throughout its history several institutions, such as residents' associations, theatre groups, magazines, film clubs, churches, and dance and sport groups have been created to fight for the rights of the resident population and to counter the impacts of violence in the community [46]. Such efforts have meant that today Cidade de Deus is politically well organised with a strong presence in the social rights movements. In 2002 the success of the Oscar-nominated film *City of God* (a direct translation of the community's name) provided a new turn for the community, placing it under the intense scrutiny of the media, nationally and internationally, but also reinforcing the stigma of a dangerous and violent area and encouraging a wave of prejudice and discrimination [46]. On the other hand, due to this exposure, the community has also frequently received "special attention" from the government and other funding institutions, such as international non-government organisations (NGOs), which used the profile of Cidade de Deus within middle-class and upper-class groups in Brazil and within the international media to showcase and promote specific actions. It is therefore an area of political significance for the city, and for low SES communities in particular.

Despite its exposure, Cidade de Deus's social indicators are among the most critical of Rio de Janeiro: approximately 70 per cent of its residents earn a monthly family income of less than double the minimum wage of approximately US\$600; 33 per cent of its working-age population are unemployed; and 23 per cent are engaged in informal work (e.g. selling goods in the streets or working casually with no formal contracts). In addition, approximately 44 per cent of the adult population has not completed primary school education, with only six per cent have reached university [48]. The population of Cidade de Deus consists mostly of young people, with more than half of its residents (53.5%) being under 30 years of age [48].

Also significant for the discussions raised in this paper, is the close proximity (approx. 6 km) of Cidade de Deus to the 2016 Olympic Park, which will be host to the Olympic Village, Media Village and most of the competitions of the 2016 Rio de Janeiro Olympic Games. The

question therefore arises as to the extent to which the area will be impacted – positively or negatively – by the hosting of the event: first, because physical infrastructure developments in and around the Olympic Park area are likely to have direct effects, and second, because there is an underlying expectation, based on government discourse, that the quality of living in the area will be significantly improved due to these infrastructural changes, with opportunities to engage in LTPA, particularly sports, being but one of several areas to be affected by the large-scale investments being made.

Despite the geographical and political significance of Cidade de Deus, no formal sport development plans or strategies have been developed for the area by the municipal or state government. Aware of this deficiency, in 2004 the community, together with members of various organisations working in the area, developed an informal plan for community development [49], in which provision for sport was discussed as a key area for improvement. According to this document, Cidade de Deus had insufficient qualified sport professionals, the sport activities available were not diversified, the community lacked projects to develop grassroots sports and projects that provide activities for different ages, and there were only a few adequate spaces for sport and LTPA practice within the community. A list of potential actions to solve these problems by 2009 was outlined, most of them to be carried out by or in partnership with the public and private sectors. However, the plan has not been revisited as of 2013, and many of the issues raised then are still present, as some of our findings confirm.

Sport policy in action in Rio de Janeiro and Cidade de Deus

As previously mentioned, sport and physical activity programmes publicly available to the Brazilian population are supported by the different levels of government, in several instances also in partnership with the private sector and NGOs. Their focus and target groups differ from case to case and the setting varies from activities run in open spaces across the cities/towns, to those available inside institutions, such as public schools. Their common feature is that they are fee-free and the participants are mostly members of low SES communities. The programmes discussed below are of this type, and are part of initiatives directly supported by the federal government that focus on LTPA participation and that were available locally to Cidade de Deus residents in 2012 or, in one case, recently terminated.

The discussion of the three programmes focuses on the issues faced for their successful implementation in Cidade de Deus. It is a critical analysis providing a glimpse into the policy context within which the programmes are situated, as well as how these public initiatives have been so far implemented in this significant period in the lead-up to the hosting of the two largest sport events in the world. It is important to note here that it was not the aim of this study to assess in detail the success of the programmes in achieving their stated objectives, but more broadly to scrutinise their implementation in light of the current discourse of the “sport decade” and the investments being made by public agencies in Rio de Janeiro under the sport “banner”.

Segundo Tempo

The *Segundo Tempo* (Second Half) programme is an initiative of the Ministry of Sport and is one of the longest uninterrupted national sport programmes in Brazilian contemporary history. Established in 2003, the same year that the Ministry of Sport was created, *Segundo Tempo* is promoted as a “programme to encourage sport participation as a factor contributing to the development of fully participating citizens and to a better quality of life” (authors’ translation) [50].

Probably due to its magnitude and the alignment of its proclaimed aims with the Olympic Education ideals [34], *Segundo Tempo* was included in the Rio 2016 bid book as one of the main programmes to be used by the Organizing Committee to promote sport participation prior to, during and after the Olympics in Rio de Janeiro [17]. This inclusion was despite the fact that the programme was already well established at the time of the bid in 2007, and therefore could not of itself be regarded as an action derived from, or a legacy of, the hosting of the Olympic Games. The argument, however, was that there would be an increase of funding directed towards the programme by the federal government as well as a guarantee of its long-term continuation [17]. As noted above, discontinuity of programmes has been a key problem in Brazilian sport policy implementation.

The *Segundo Tempo* programme focuses on children and youth who are exposed to social risks and its objectives are summarised in Table 5.1. The programme is part of a wider agenda that seeks to encourage sport practice as an educational tool, providing elements that will:

facilitate a critical reflection about the different contexts of social risks, as well as reduce the time children and youth are exposed to the harmful effects of violence, family instability, drug trafficking, malnourishment, and lack of care, among many other factors that lead to denigration of human dignity (p. 23, authors' translation) [51].

It therefore sits within an agenda of “sport for development” [24], fitting the “diversion” and “pro-social development” mechanisms proposed by Nichols’s (2007) sport programme typology [52]. However, unlike some international examples in this area (c.f. Coalter, 2007; Nicholson *et al.*, 2010) [24, 25], the Ministry of Sport does not conduct a systematic assessment of the programme in regard to its effectiveness in reaching its aims,² nor are any formal monitoring measures embedded within the programme.

The programme is implemented through cooperation between the third sector and public institutions. Different organisations may apply to engage in the partnership, which consists of the Ministry of Sport funding a fairly standardised sport development project and the partner organisation delivering the project in its selected community. One partner organisation may run programmes in a number of centres, each referred to as a nucleus. The project is required to: reach at least 100 children/youth; offer each participant a choice of at least three types of LTPA, with a minimum participation frequency of three times a week, for 2–4 hours a day; run activities outside regular school hours; and provide snacks/refreshments as well as a uniform to all participants [53].

In each nucleus, the proponent is required to fund one general coordinator (full-time or part-time), and the Ministry of Sport funds one full-time pedagogical coordinator, and one part-time sector coordinator, covering a number of nuclei.³ In addition, for each nucleus the Ministry of Sport funds one part-time coordinator, one part-time sports instructor and one part-time instructor for “complementary activities”⁴ (e.g. educational, cultural, artistic). The standard duration of contracts is 15 months and can be renewed upon request, after financial acquittal is submitted.

In Cidade de Deus, according to the sports coordinator of the local community, the only nucleus of the *Segundo Tempo* programme within Cidade de Deus was based in a local public school and reached approximately 250 children. However, he indicated that it was terminated in 2009 because the government did not renew the contract with the organisation responsible for administering this specific programme, but the reason for this

was not clear. However, another resident involved with sport in the community indicated that the local *Segundo Tempo* programme had been available until 2010 and that its closure had been due to corruption-related scandals. Available information is conflicting, but a macro-scale incident sheds some light on the issue: in 2011 the former Minister of Sport, Mr Orlando Silva, was accused of diverting funds and making irregular contracts [54] as well as being involved in a series of allegations of fraud [55], all relating to the *Segundo Tempo* programme. In effect, despite the city being on the brink of hosting the Olympic Games, the longest standing sport programme in the country has not endured long enough in Cidade de Deus to be part of any Olympic legacy.

PELC/PRONASCI (Program of Sport and Leisure in the City/National Public Security with Citizenship Program)

Another federal government project focusing on the promotion of sport and physical activity engagement in Cidade de Deus is a joint initiative of two ministries: the Ministry of Sport and the Ministry of Justice. The Ministry of Sport's Program of Sport and Leisure in the City (PELC) is an umbrella programme that operates different projects in the broader area of LTPA participation. Its main stated goals are: 1. the training of managers and community leaders regarding the possibilities and importance of developing public policies for sport and leisure; and 2. the promotion of community integration by raising the self-esteem of participants and contributing to their access to this social right [56]. It runs what is referred to as "spaces of reference" for social interaction within communities, in places such as public squares, church halls and football fields, all involving sport and leisure activities. The Ministry of Justice's *National Public Security with Citizenship Program* (PRONASCI), on the other hand, involves several different types of action to reduce violence and criminality in the country, and is based on the articulation of security policies with government action in the social sphere [57].

The PELC/PRONASCI programme is an inter-ministerial action plan designed to tackle more effectively the causes and manifestations of violence through the medium of sport [56, 58, 59]. Details are provided in Table 5.1. It is intended to provide opportunities for the social reintegration of young people in conflict with the law or who are considered socially vulnerable, so that they find motivation in sport to develop personally and socially [59]. PELC/PRONASCI activities go beyond sports practice and involve other activities of interest

to youth, such as hip hop, graffiti and cinema workshops. The programme therefore, fits the “diversion” and “pro-social development” mechanisms in Nichols’s (2007) sport programme typology [52] and can also be considered a “sport for development” programme [24]. When deciding the locations for the physical establishment of the programme, therefore, priority is given to urban neighbourhoods with high rates of violence. In Rio de Janeiro, the programme was also supported by the city council’s Sport and Leisure Department (SMEL).

Similarly to *Segundo Tempo*, PELC/PRONASCI is implemented through partnerships with interested organisations (e.g. NGO, state/local government agency, university). Each local programme is referred to as a nucleus and is administered by a governance group, comprising a general administrator and representatives from stakeholder groups (e.g. the partner organisation, nuclei coordinators, the community) [51].

According to the Secretaria Municipal de Esporte e Lazer (SMEL), the PELC/ PRONASCI nuclei in Cidade de Deus were structured to operate in one *Praça da Juventude*⁵ (Youth Square) programme and three *praças* (public squares) within the area [59]. However, none of these were actually in operation when researchers visited the community. This was confirmed by visits to all *praças* and by consultation with local residents. In addition, the former coordinator of a PELC/PRONASCI nucleus, who was also a local resident, confirmed that the programme ran in the Cidade de Deus community for less than two years, until June 2012. Furthermore, the nuclei were located in different places from those indicated on the official website.

Local informants indicated that the project, when in full operation, reached around 800 children and adolescents outside of school hours, although numbers were not stable, sometimes falling to 500 participants. The numbers, per se, demonstrate the demand for such programmes in these communities. But local informants were highly critical of the conditions of work and delivery of activities provided by the programme. For example, it was claimed that the only activities offered were football, basketball and volleyball – activities that are already the most widely available for children in the community. There was no opportunity to develop other Olympic sports although several empty spaces in the community could have been used to accommodate better sport/physical activity infrastructure, including a longed-for public swimming pool.

Academia na Praça

The *Academia na Praça* (Fitness Studio in the Square) project is jointly financed by the Ministry of Sport (federal government), the Rio de Janeiro City Council (local government) and the Santander Bank (private enterprise). The project was designed by an NGO that is also responsible for managing and implementing a number of local programmes across the country. It was, therefore, an initiative of the third sector with government support and private sector funding. The project fell within a Ministry of Sport programme associated with the *Lei de Incentivo ao Esporte* (Incentives for Sport Law), which allows private enterprises to direct one per cent of their taxes to sport/physical activity projects approved by the government and, in return, have their brand associated with these (see Table 5.1). In Rio, this specific project was initially established on beaches adjacent to the more affluent areas of the city, but recently it has been established in three low SES communities, including Cidade de Deus [60].

Academia na Praça was the most visible public project for sport and physical activity promotion in Cidade de Deus, catering for individuals aged 15 years and above. It was established in June 2011 and comprised twenty-five stainless steel weight machines installed in the centrally located praça, with four physical education professionals employed to run fitness classes, supported by trainees [61]. Yoga, tai chi-chuan and capoeira classes were also offered and all activities were free of charge. The gym was open from Monday to Friday (6–10am and 4–8pm) and on Saturdays (7–10am), but was closed in times of rain as the cover is not sufficient to protect participants and equipment from getting wet.

While the programme was “free to all”, participants were still required to formally enrol, which included undertaking a medical exam to indicate whether they were fit to engage in physical activity. Individuals therefore needed to make an appointment with a medical practitioner, but in most cases local community members could afford to do so only in a public hospital or public medical care unit. However, public health services in Rio de Janeiro are notoriously deficient and there are often long waiting lists of sometimes days or weeks for basic medical appointments. Such a requirement was therefore an impediment for individuals who lacked the time (or patience) to obtain the medical exam. In fact, several residents indicated that the requirement of a medical exam to enrol in most, if not all, sport and physical activity projects available in the community was indeed a significant barrier to

participation. This was even more problematic for the elderly, who were usually required to go through an echo-cardiogram, a procedure that can only be undertaken in hospitals. Hence, a project that designed to reach a large cohort of community members and aimed at improving the health of the community from the outset presented a significant constraint to widespread participation.

Discussion

The three programmes described above are the most recent measures developed by, and/or implemented with the support of, the Brazilian federal government to promote sport and physical activity practice in Cidade de Deus. Two of them, with a focus on social vulnerability, can be categorised as “diversion” and/or “pro-social development” mechanisms designed to reduce social risks among children and youth living in low SES communities, while the third, involving the voluntary sector, has the more pragmatic approach of simply improving physical fitness and health.

Without seeking to assess the effectiveness of these programmes as “sport for development” initiatives in particular, our results indicate that there two key issues hindering the effective delivery of the sport and physical activity programmes examined in Cidade de Deus: instability/continuity and the “sub-contractual” nature of the programmes. These are discussed in turn below.

The instability and discontinuity of sport development programmes is a problem previously identified by other researchers in Brazil [62, 63] and internationally (c.f. Coalter, 2007; Nicholson *et al.*, 2010) [24, 25]. The main source of this problem is that publicly funded sport programmes depend on political will, with contingencies, programmes and projects typically being interrupted, or significantly modified, with every new election. The term “administrative discontinuity” has been attached to the practice of discontinuing programmes, successful or otherwise, developed and implemented by the previous government when it is of a different political party [64]. This is particularly challenging in Brazil, which hosts 27 different political parties, most of which have elected representatives in the legislatures of at least one level of government. Changes in political leadership and agendas are, therefore, common and “administrative discontinuity” is a consequent “pathology” of the system.

Problems of discontinuity are a feature of two of the three programmes described above, despite the relative political stability experienced by the country for the past ten years. However, in addition to the level of political stability at the national level, “on the ground” experiences seem far from stable. Although the *Segundo Tempo* project, for example, has been running across the country for a number of years, the longevity of each nucleus of activity is unstable, as the Cidade de Deus case indicates. A study conducted by Athayde and Mascarenhas (2009) presents even stronger evidence for the claim; the findings of an investigation of *Segundo Tempo* in the Brazilian Federal District between 2003 and 2006 showed that the number of nuclei in operation varied widely from year to year, and that only a few projects continued for more than one year [62]. In addition, newly established projects have no well-defined long-term aims and their continuity is never fully secured. As Suassuna (2007) argues, all sport programmes reviewed in this study are not part of an apolitical national sport policy programme with multi-party support at all levels of government [65]. They are but short-term or medium-term programmes established to attend immediate public demand. Such a situation is recurrent in developed and developing nations (c.f. Coalter, 2007; Nichols, 2007; Nicholson *et al.*, 2010) [24, 25, 52], reflecting the vulnerable position of sport and physical activity policy in the wider public policy agenda.

A further reason for the lack of continuity in Brazil is the internal conflicts within and between public administration bodies mentioned by Melo (2005) [26]. As programmes are usually implemented as partnerships between government and private institutions and NGOs, conflict regarding the different *modus operandi* of different organisations can lead to over-bureaucratisation and conflict of interest which can result in eventual discontinuation of programmes [62]. Although it has been advocated that effective policy interventions aimed at sport and leisure promotion need to go beyond the sport sectors [20], including, for example, the legal/judicial system as in the PELC/ PRONASCI programme discussed, this can present further difficulties arising from differing goals and professional practices.

The second major issue affecting the implementation of sport policies in Brazil relates to their “sub-contractual” nature, which transfers a great deal of the government's constitutional responsibilities to the non-government sector [66, 67]. Following the populist, but arguably neoliberal, agenda of the current Labour Party government in Brazil [67, 68], public policies such as the Incentives for Sport Law within which the “*Academia na Praça*” is located, are commonly justified by promoting their flexibility in terms of target groups being

reached, the variety of activities to be offered, the communities targeted, and also – most importantly – the engagement of the private sector to reduce the financial burden on the state. However, if this policy is critically analysed, some key weaknesses can be identified. First, the involvement of private sponsors exacerbates the problem of discontinuity, because they are not required to make a long-term commitment of support. Second, the problems of bureaucracy and conflicting objectives are increased [62, 67], since the main interest of private business is typically in the high visibility of the project and its marketing potential, thus placing small-scale projects or projects located outside important consumer markets at a disadvantage. Third, issues of accountability and consistency in content delivery may be jeopardised by delegating the task of managing the projects to a number of private or third sector institutions.

In effect, therefore, the approach to public sport policy encountered in Cidade de Deus represents a clear attempt to shift the responsibility for funding and delivering sport development programmes from the state to NGOs or private institutions that are interested in associating their names with “government-certified” sport programmes [66]. Within the context of the “sport decade”, this issue is of particular significance as billions of public dollars are being spent in the name of sports but do not seem to be directed towards the development of long term opportunities for low SES communities to access sustainable and coherent sport and physical activity programmes. This does not seem to be an isolated case in mega-events-related programmes, with South Africa having faced issues of a similar nature when hosting the 2010 FIFA World Cup [69].

Conclusion

In its march to attain international prominence as a prosperous and potentially powerful country, Brazil has engaged in the race to host sport mega-events. At the end of the second decade of the twenty-first century Brazil will have hosted the two largest sport events in the world – the FIFA Football World Cup and the Summer Olympic Games – and at least three other major sport events. According to the Rio de Janeiro Olympic Games bid book, one of the key aims of hosting the Olympic Games in Rio de Janeiro is to promote and develop sport in the country [17]. In fact, more than that: “In addition to the physical legacy of sporting facilities and trained sport volunteers resulting from the games, the Rio 2016 Legacy Plan includes initiatives to develop sport in Brazil, South America and the rest of the world” [17,

pp.17]. Our study was aimed at investigating the extent to which the Brazilian Government is preparing and delivering their stated sport participation legacies in one high profile location. It follows Horne's (2012, p. 2) suggestion that difficult questions about the hosting of sport mega-events, particularly the Olympic Games, need to be asked because, if "shedding new light on sport and the Olympics can lead to alterations and challenges to balances of power, this might bring about change in sport or the Olympics and thus contribute to wider progressive social change" [70]. However, our findings indicate that the initiatives so far proposed and executed in the case study area have not been extensively felt or successful in reaching the people who are in most need.

We conclude that it is not sufficient to implement scattered sport programmes across the city that have no long-term focus or commitment, and that do not engage with an approach to sport participation that is critical and empowering for the marginalised residents of the city. Within this context, it is difficult to avoid the conclusion that the overarching ideology behind the planning and delivery of sporting mega-events and their legacies in Rio de Janeiro is guided by a Western neo-liberal economic development philosophy that sees such events simply as tools for growth [71]. Priority for the spending of public money is given to large-scale stadium and other infrastructure construction, but little is spent to secure education and health benefits through mass participation sport programmes. We therefore concur with Cornelissen (2010) when she argues that the exceptional case of international exposure through sport mega-events lies within a political agenda that seeks more than just the purported economic and social gains these events may bring [72]. In fact, our results indicate that similarly to South Africa in 2010, the "targeting and actual patterns of public expenditure are at odds with the national government's purported focus on social development" (p. 525) [69]. Increasing mass sport participation in Rio de Janeiro does not appear to rank highly in any such agenda.

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Notes

1. LTPA is defined as “recreational and sport physical activity, including a range of activities conducted specifically for enjoyment, social, competitive or fitness purposes, performed in leisure or discretionary time” (p. 21) [73].
2. An assessment report was made publicly available for the first (and only) time in 2010. However, the evaluation was based on an opinion survey with a small, selected sample of participants and family members, focusing little on behaviour change and mostly on general practical issues such as the quality of facilities and enjoyment of activities.
3. Only for contracts that include more than 19 nuclei or 2,000 participating children/youth.
4. All nuclei need to offer LTPA activities plus “complementary” activities.
5. *Praça da Juventude* is yet another federal government project targeting communities located in urban areas which have limited or no access to public sport and leisure facilities. It is a programme designed by the Ministry of Sport and implemented with state and local government support, as well as through the abovementioned partnership with the Ministry of Justice [58].

Table 5.1. Federal government's (Ministry of Sport) main policies and programmes related to sport development and LTPA promotion.

Date	Policy/ Programme / Project	Partner Institutions	Aim and objectives	Focus (e.g. high performance, educational) and Promoted Outcomes
1995	<i>Centros de Excelência Esportiva</i> (CENESP) (Centres for Excellence in Sports)	Universities, Brazilian Olympic and Paralympic Committees and sport organisations	Use sport science to improve training and performance of athletes from different sport disciplines. The programme has six main objectives: 1) Detect/select/develop sport talents in Olympic/Paralympic sports 2) Support the training of high performance athletes 3) Up-skill human resources in the field of sport training 4) Improve access to scientific knowledge in the field of sport training 5) Develop and share new sport training technologies	High performance The following activities are in operation in the 9 established centres: 1) High performance athletes' assessments 2) Identification of new athletes 3) Funding of scientific and technological events and exchanges 4) Human resources training 5) Funding of research projects
1999	<i>Pintando a Liberdade</i> (Painting the Freedom Programme)	Other federal, state and/or municipal government departments and NGOs	Intends to promote the re-socialisation of prison inmates through the manufacturing of sport equipment/goods. Programme expanded scope through the <i>Pintando a Cidadania</i> project in at-risk communities under the same structure. Programme workers paid for their work/ production and prisoners have reductions in time served. Linked to other programmes such as the <i>Segundo Tempo</i> .	Educational Data available from 2007 ^a : 1. 90 production units across the country 2. 12,700 interns involved
2001	PIVA Law	-	2% of proceeds from the national lotteries be allocated to the Brazilian Olympic (85%) and Paralympic (15%) Committees (15% of sum for educational sport projects)	High performance

Table 1.(Continued)

Date	Policy/ Programme / Project	Partner Institutions	Aim and objectives	Focus (e.g. high performance, educational) and Promoted Outcomes
2003	<i>Programa Segundo Tempo</i> (Second Half Programme)	Other federal, state and/or municipal government departments and NGOs	<p>Promote/expand access to sports/active leisure among children/youth in socially vulnerable areas, as a means to improve quality of life.</p> <p>Provide educational activities; offer adequate conditions for the practice of sport; develop social values; improve physical abilities, self-esteem, health, social integration; reduce exposure to social risks – e.g. drugs, prostitution, teenage pregnancy, crime, child labour.</p>	<p>Educational</p> <p>Data available from 2010^a:</p> <ol style="list-style-type: none"> 1) More than 185,000 <i>Segundo Tempo</i> projects were in operation 2) More than R\$140 million invested (US\$70 million) 3) Approximately 1 million children/youth participants^a <p>Leisure and recreation</p> <p>In 2010^a the following PELC projects/activities were in operation across the country:</p> <ol style="list-style-type: none"> 1) PELC Nuclei, a sport and leisure project for all ages 2) ‘Healthy Life’, an LTPA project for the elderly 3) PELC/PRONASCI projects for youth-at-risk 4) funding for social policy research in recreational sport and leisure through the CEDES Network 5) scientific and technological interdisciplinary events; 6) collaborative governance of sport and leisure through workshops, seminars, etc.
2003	<i>Projeto Esporte e Lazer na Cidade</i> (PELC) (Sport and Leisure in the City Project)	Other federal, state and/or municipal government departments and NGOs	<p>Expand and universalise access to recreational sport and leisure to foster human development and social inclusion. Actions integrated with other public policies and also aim to increase knowledge in the field.</p> <p>Three central objectives:</p> <ol style="list-style-type: none"> 1) To manage centres for sport, recreation and leisure in different regions guarantee access for the entire population. 2) To manage the Network of Centres for Development of Recreational Sport and Leisure by encouraging and promoting the production and dissemination of scientific and technological knowledge. 3) To modernise and implement infrastructure for sport, recreation and leisure, including the construction and refurbishment of sport and leisure facilities. 	

Table 1.(Continued)

Date	Policy/ Programme / Project	Partner Institutions	Aim and objectives	Focus (e.g. high performance, educational) and Promoted Outcomes
2004	<i>Programa Bolsa Atleta</i> (Athlete's Scholarship Prog.)	n/a	Provides a monthly stipend for high performance athletes, primarily in Olympic and Paralympic sports. There are different categories of scholarships, from junior athletes to internationally acclaimed athletes.	High Performance In 2012, 4992 athletes were granted the scholarship.
2005	National Sport Policy	-	Expand access to sport and leisure; promote civic rights equality, ensuring access to sports practice/ knowledge in this field; decentralise the governance of sport; promote educational/grassroots sport participation; strengthen a sports culture identity; improve elite athlete performance.	All manifestations of sport, recreation and leisure
2006	Sports Incentive Law	-	Individuals and organisations can use 6% and 1%, respectively, of their taxes to sponsor a sport project that has been previously approved by the Ministry of Sport. The sponsorship can be directed to a sport federation, sport club, or other relevant associations.	All manifestations of sport, recreation and leisure
2006	<i>Timemania</i> (Team Mania Project)	Sport organisations	A lottery based on the three Brazilian football leagues, with 22% of the profits donated back to the participating teams, 3% to educational and social sport projects and 2% to the PIVA Law.	All manifestations of sport, recreation and leisure

CHAPTER 6

Does being an Olympic city help improve recreational resources? Examining the quality of physical activity resources in low income neighbourhood of Rio de Janeiro.

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Does being an Olympic city help improve recreational resources? Examining the quality of physical activity resources in low income neighbourhood of Rio de Janeiro.

Abstract

Background: The environmental urban regeneration necessary for hosting large scale sport events is frequently promoted as a good opportunity for enhancing the number of physical activity resources (PARs) available to the local population and therefore to improve general well-being and health through sport and physical activity participation. The objective of this study was to assess the quality of public PARs in a low socio-economic community in the Olympic city of Rio de Janeiro.

Methods: The Physical Activity Resource Assessment (PARA) instrument was used to assess the features, amenities and incivilities characteristics of all 29 public PARs in Cidade de Deus. In order to determine the quality of the PARs, a Quality Indicator (QI), based on PARA results, was calculated.

Results: The QIs ranged from -8 to 18 points, where the possible minimum and maximum values for QI were -36 and 75 respectively. The average QI of the PARs assessed was 1.3 ± 6.40 and the median was equal to 1 point, a considerably low score if compared to the average and median scores of public PARs across the city (13.6 ± 4.91 and 13 points respectively). Findings indicate that the high number of elements that can discourage the use of these spaces may help explain the low level of physical activity during leisure time that has been reported in a previous study conducted with residents of the same neighbourhood.

Conclusions: Despite having a reasonable number of PARs, our study showed that the quality of the facilities located in Cidade de Deus is very low. Policies to encourage physical activity, whether using the Olympic Games as a trigger or not, need to focus also on the built environment, particularly in socially vulnerable areas.

Keywords: Built environment; Physical activity resources; Rio 2016 Olympic Games; Low socio-economic status community

Background

Despite widespread knowledge of the health benefits of physical activity (PA), high rates of sedentary behaviours, particularly during leisure time, still predominate worldwide [1]. In Brazil, just 33.8% of the adult population achieves the recommended levels of leisure-time physical activity required to attain health benefits [2].

In the context of high rates of physical inactivity during leisure time [3], many authors suggest that not only personal choices are responsible for the low rates of PA, but also that environmental and policy contexts can play an important role in the adoption of healthy behaviours, including regular and sustainable PA participation [4,5]. Accordingly, many scholars have tried to assess the influence of the built environment on levels of PA [6,7,8], with results indicating that the built environment is indeed an important predictor for PA engagement [9,10,11]. Previous studies have found also that the levels of physical activity are higher among people living in neighbourhoods with green spaces [12,13] and that people living in green neighbourhoods have lower risk of presenting mental health issues as well as cardiovascular diseases [12,14].

A particular focus of research in this field has been the characteristics of the neighbourhood of residence and their impact on PA behaviour of the local population [15,16]. Results indicate that living in a more walkable neighbourhood increases the adoption of the habit of walking for exercise [17,13] and the levels of individual physical activity; physical activity resources (PARs) are less available in poor/minorities neighbourhoods [18]; and the quality and maintenance of existent PARs is an economical strategy to increase PA participation [15].

An important issue regarding PARs and levels of leisure-time physical activity practice in the context of this study refers to the sport mega-events being hosted in Brazil in this decade, particularly in the city of Rio de Janeiro (i.e. 2014 FIFA World Cup and 2016 Summer Olympic Games). The environmental urban regeneration necessary for hosting large scale sport events has been considered by government agencies and event organizing committees as a great opportunity for enhancing the number of PARs and improving health quality through sport participation [19,20,21], particularly in low socio-economic status (SES) communities [21]. However, there is still lack of empirical evidence to support this claim [22,23,24].

In this context, the main objective of the present study is to evaluate and discuss the quality of public PARs available in a low SES community in Rio de Janeiro.

Methods

Study Design

The Physical Activity Resource Assessment (PARA) instrument [25], a direct-observational tool, was used to assess the features (presence of PA infra-structure, e.g. football field, basketball court, exercise stations), amenities (supporting structures such as drinking fountains, bathrooms and lighting) and incivilities (elements that can discourage the use of the space, e.g. graffiti, litter) of all 29 'praças' (i.e. PARs) in Cidade de Deus. In Brazil, praças are traditional open built areas that provide a space for passive and active leisure, usually presenting some basic PA infrastructure and frequently hosting public sport and PA programs [26].

The scores for all variables measured were achieved by applying PARA's guidelines for measurement: 13 features and 12 amenities are assessed on a scale from 0 to 3, where 0 = not present, 1 = poor, 2 = mediocre, 3 = good; while 12 incivilities are scaled from 0 to 3, where 0 = not present, 1 = little/few, 2 = some, 3 = a lot [25].

The PARA instrument has been used internationally and previous studies have shown that this check-list instrument has a good inter-rater reliability ($ks > 0.77$) [15,27,28].

Data Collection

Data was collected in Cidade de Deus, a low SES neighbourhood in the western region of Rio de Janeiro, and focused on the assessment of public PARs available within this community. Cidade de Deus occupies an area of 1.2km², has a population of 36,515 inhabitants and a population density of 32,523 inhabitants per km². This neighbourhood presents social indicators among the most deprived in the city, ranking 135th in the Social Development Index (SDI), among 158 neighbourhoods in Rio de Janeiro [29]. Significantly, this low SES community is the most populated in the vicinity of the future Olympic Park (circa 6 km). Data were collected between April and July 2012 by two trained researchers in the application of the data collection instrument.

Analysis

In order to determine the quality of the public PARs investigated, a Quality Indicator (QI) was calculated by summing the scores assigned to the features and amenities categories and subtracting the score generated by the incivilities category [30]. The possible minimum and maximum values for QI were -36 and 75 respectively.

A k-means cluster analysis technique was used to investigate the praças' quality based on the three components assessed: features, amenities, and incivilities. The number of clusters to be used was determined by the between-clusters inertia-increase criteria. In cluster analysis, between-cluster inertia indicates the degree of separation between clusters; the higher the between-clusters inertia, the higher the cluster separation.

Results

The QIs of the PARs ranged from -8 to 18 points. The average QI of the areas assessed was 1.3 ± 6.40 and the median was equal to 1 point.

Figure 6.1 presents the increases in the between-clusters inertia. The highest increase is observed from two to three clusters. Three clusters were therefore used for the analysis as the increase in inertia after this point was too low to justify the increment in the number of clusters.

Figure 6.1: Between-clusters inertia according to the number of clusters.

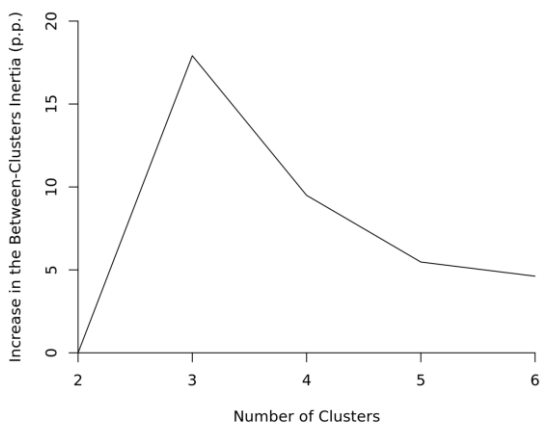
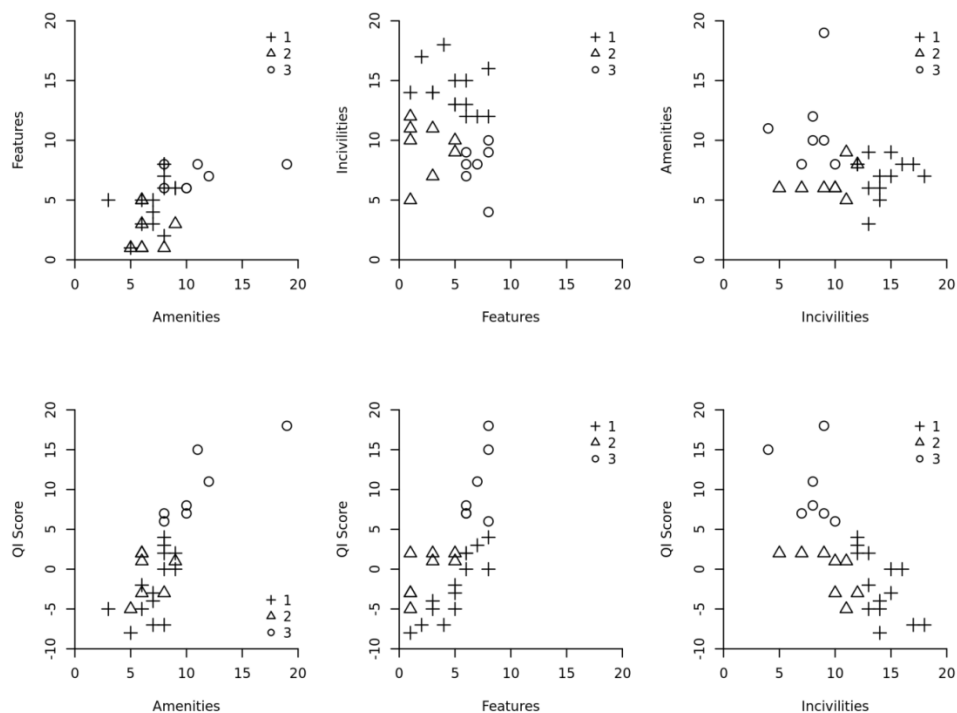


Figure 6.2 shows the three groups (1, 2 and 3) obtained by the combination of features, amenities and incivilities after the cluster analysis.

Figure 6.2: Distribution of praças according to the cluster, features, amenities, incivilities, and Quality Indicator.



Both groups 1 ($n=14$) and 2 ($n=8$) had negative QIs (-2.1 ± 4.02 and -0.4 ± 2.83 , respectively), presenting a combination of low scores for amenities and features and a high score for incivilities. Group 3 ($n=7$) had the highest QI among the three groups (10.3 ± 4.61), presenting the highest scores in the features and amenities categories and the lowest score in the incivilities category (Table 6.1).

Table 6.1. Results of assessment of the physical activity resources visited in Cidade de Deus, Rio de Janeiro, Brazil, April-July, 2012.

	n	Quality Indicator Total (mean \pm sd)	Features	Amenities	Incivilities
Group 1	14	-2.1 ± 4.02	4.9 ± 2.13	7.1 ± 1.64	14.1 ± 1.88
Group 2	8	-0.4 ± 2.83	2.5 ± 1.77	6.5 ± 1.31	9.4 ± 2.33
Group 3	7	10.3 ± 4.61	7.0 ± 1.00	11.1 ± 3.76	7.9 ± 1.95
Total	29				

Discussion

In general, the quality of Cidade de Deus' PARs is very low, with QIs ranging from -8 to 18 points, an average of 1.3 ± 6.40 , and the median equal to 1 point. With the exception of Group 3, which comprises praças with the highest QI, groups 1 and 2 had negative mean scores. Incivilities were shown to be the most important variable for the low quality of PARs in Cidade de Deus. Low scores were also found, however, in the features and amenities of PARs in Groups 1 and 2, which indicates that PA infrastructure is frequently either not available or not in good condition to be used.

As a point of comparison, Vieira and colleagues [30] analysed 38 PARs located in different neighbourhoods across Rio de Janeiro and found considerably higher QI scores (ranging from 7 to 20 points, average of 13.6 ± 4.91 and median equal to 13 points). In their study, the public spaces located in neighbourhoods with lower SDI levels were more likely to have a lower QI. However, even the PARs that presented the lowest quality scores in that study presented an average QI considerably higher (9.3 ± 2.16) than the average QI of PARs in Cidade de Deus. The fact that Cidade de Deus' SDI is lower than the lowest SDI neighbourhood included in Vieira et al.'s study [30] might be a potential explanation for such a difference. Studies outside Brazil have constantly indicated that low SES communities tend to have less availability of PARs and/or PARs of lower quality than those found in higher income neighbourhoods [31]. Importantly, in the Vieira et al.'s study [30] the averages found for features were similar in both high and low QI groups, with significant differences being found only for amenities and incivilities; in Cidade de Deus both features and amenities were of low quality and incivilities were also still largely prevalent. Similarly, Suminski et al.'s study [32] showed that parks located in neighbourhoods with higher percentages of racial/ethnic minorities, which is also the case of Cidade de Deus, present poorer quality features and amenities.

In regard to the different characteristics of PARs and how they affect the overall quality and use of these spaces, Adamus et al. [15] found that although the features and amenities of PARs that were free of charge were better than chargeable PARs, those free access PARs had a higher number of incivilities. Significantly, Heinrich et al.'s study [27], which investigated PARs located in public housing neighbourhoods in Kansas City, USA, observed that accessibility to free-of-charge PARs was positively associated with the number

of days per week in which local residents engaged in vigorous PA. However, the authors found that there is a negative association between the average number of incivilities present in the neighbourhood's PARs and the number of days local residents walk for leisure per week. In Cidade de Deus, where all PARs analysed were free of charge, incivilities were extremely frequent. Considering the findings of previous studies and the characteristics of the built environment for PA practice in Cidade de Deus, it is possible to suggest that the low engagement with PA during leisure time found among women residents of this neighbourhood [33] might be related to the low quality of PARs encountered in this community.

The strategic location of Cidade de Deus, in close proximity to the 2016 Olympic Games Olympic Park, suggests that this low SES community could greatly benefit from the public investments in urban regeneration being made across Rio de Janeiro. Importantly, the delivery of opportunities for PA practices well before and after the Games, particularly for low SES communities, was a stated commitment of the Rio 2016 Organizing Committee as part of their Olympic legacies program [21]. The results of this study indicate that efforts in this direction are overdue. Unfortunately, however, there is a lack of evidence to suggest that being an Olympic city contributes to increasing PA and sport participation at a local population level [34,35,36]. It is suggested that for such benefit to occur, clear investment in PA and sport infrastructure as well as positive changes in policy and practice must to be implemented as part of the hosting plans [37,38,39]. In this sense, the present study highlights the need for such investments to be appropriately made in Rio de Janeiro in general, and in low income communities such as Cidade de Deus specifically, as the 2016 Olympic Games fast approaches.

Conclusions

This study focused on analysing the quality of public PARs available in a very densely populated low SES community in the Olympic city of Rio de Janeiro. International studies have constantly indicated that low SES communities tend to have less availability of PARs and/or PARs of lower quality than those found in higher income neighbourhoods. Our study reinforces such findings with results indicating that despite having a reasonable number of PARs, the quality of the facilities located in Cidade de Deus is very low. Importantly in the

context of this study is the potential impact low quality PARs are having on PA levels of the local population.

It is important to note that the study presented here is a cross sectional study that did not attempt to analyse further improvements of the Cidade de Deus' PARs since data collection in 2012. A longitudinal study is required to show more accurately the relationship between hosting the Olympic Games and its impact on public PARs in low income communities. Findings reinforce, however, that policies to encourage PA, whether using the Olympic Games as a trigger or not, need to focus on the built environment, particularly in socially vulnerable areas, if we are to reach the PA levels necessary to achieve the desired health indicators.

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CHAPTER 7

Physical activity levels of economically disadvantaged women living in the Olympic city of Rio de Janeiro

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Physical activity levels of economically disadvantaged women living in the Olympic city of Rio de Janeiro

Abstract

The objective of this study was to analyze the physical activity (PA) patterns of women living in a low-income community located in close proximity to the 2016 Rio de Janeiro Olympic Park. Data (N = 140) were collected in June and July 2012 using the International Physical Activity Questionnaire. Findings indicated that the majority (54.8%) of participants reported high levels of physical activity. The domains that contributed the most to this pattern were occupational and household physical activity. Significantly, 88.1% of participants reported low physical activity levels during their leisure-time. In the transport related domain, participants were relatively more active, but more than half of them (57%) spent less than 600 MET-minutes/week in this domain. The results highlighted the discrepancies between different physical activity domains. In addition, the findings also suggested that low-income women in our study engaged little in physical activity during their leisure time. Therefore, the proposed commitments found in the Rio de Janeiro Candidature File to host the 2016 Olympic Games to increase sport/physical activity participation within low-income communities in Rio de Janeiro need to be implemented effectively if this physical activity behavior during self-directed time is to be changed.

Keywords: Rio de Janeiro, PA patterns, women, low-income communities, 2016 Olympic Games

Introduction

Despite the scientific evidence that physical inactivity is an important risk factor for a number of non-communicable diseases, such as cardiovascular diseases and diabetes [1, 2], 20% of the world's adult population can be considered physically inactive [3]. Therefore, promoting and dealing with population patterns of physical activity (PA) engagement has increasingly become a major issue in the public health agenda of countries worldwide [4].

In Brazil, non-communicable diseases are responsible for 72% of all deaths [5], a higher rate than the world average of 63% [6, 7]. This alarming rate notwithstanding, only

30.3% of the Brazilian adult population achieved the recommended levels of PA during leisure time, according to a survey conducted in 2011 by the Brazilian Ministry of Health [5].

Importantly, rates of PA are not distributed evenly in society, and several studies have indicated that, among other demographic differences, women are less likely to participate in PA than men [3, 8, 9]. In Brazil, women have been found to be significantly more sedentary than men during their leisure time [10, 11], and socioeconomic and educational levels also have been associated with the levels of leisure-time physical activity (LTPA) [5, 11]. As a consequence, public health strategies to enhance the number of people engaged regularly in PA should consider differences in gender and socioeconomic status [12].

According to Murphy and Bauman (2007), sport mega-events, such as the Olympic Games, are perceived as a great opportunity for changing the PA behavior of the population, transforming community sport euphoria into motivation for PA practice [13]. However, scarce evidence is available to support the notion that sport mega-events have an impact on PA and sport participation at the population level [14].

Despite this lack of evidence, in the candidature file to host the 2016 Olympic Games in Rio de Janeiro (Rio 2016), Brazil proposed that an increase in sport participation levels would be one of four key Olympic legacies [15]. In several instances, the document mentions future actions and programs to achieve such a goal, such as the Olympic Training Center (OTC), which is intended to “support programs in its neighbouring communities to stimulate sports participation and healthy lifestyles, particularly among the disadvantaged and young people” [15, pp. 23]. The document also states that competition venues built for the event will be “underpinned by a solid business plan ensuring long-term sustainability for Olympic and Paralympic sport development and community participation” [16, pp. 9]. More significantly, the Rio 2016 bid committee asserted that existing sport participation initiatives will be consolidated “to enable increased investment in new sport infrastructure and programs. The funding will also be used to promote sport participation and community access to Games venues, helping thousands live their passion through sport. [. . .] It is anticipated funding will grow from USD \$80 million to at least USD \$200 million by 2016 to support a variety of sport infrastructure and program developments” [15, pp. 25].

However, despite reference to a sport and PA participation legacy, the document is vague regarding the strategies that will be developed to achieve such a goal and, so far, 5

years from when the document was submitted, results do not seem promising [17]. No other document describing a consistent and strategic plan for increasing PA and sport participation among the Rio de Janeiro population has been made available to the public at the time of this writing.

In this context, the study presented in this article aimed to analyze the current PA patterns of women living in the low socio-economic status (SES) community of Cidade de Deus in Rio de Janeiro, which is in close proximity to the 2016 Olympic Park. The results of the study are intended to serve as an initial source to assist the planning of a PA/sport participation legacy and the development of strategies for health enhancement through PA engagement particularly for women living in low income communities in Rio de Janeiro.

Methods

Study sample

Selection and eligibility criteria for all participants were: aged 18 years or above, female, and resident of Cidade de Deus—a low SES community of Rio de Janeiro located in close proximity (circa 6 km) to the 2016 Olympic Park and that presents social indicators among the most critically low in the city [18, 19].

To achieve a sufficiently large sample size and demographic diversity through this approach, two sampling methods were used. First, participants were selected by convenience among adult women who were at one of the five sites in Cidade de Deus included for data collection (see below). The selection of sites was based on ease of access to a relatively varied sample of resident women. The selected sites were: two public schools, one church, the local public health care unit, and a non-government organization that provides sport and extracurricular education for children. At this stage, women who verbally confirmed meeting the eligibility criteria described above were invited to participate in the study and were informed about its purpose and the procedures involved.

The second method used was a snowball sampling technique [20, 21]. Participants who took part in the first stage were asked to identify other potential participants for the study. The researchers then personally contacted these individuals and arranged a time for a face-to face interview. Once consent was obtained, the same data collection procedures applied.

In total, 146 individuals were approached, all of them meeting the eligibility criteria, and 140 agreed to participate in the interview, resulting in a 90.4% participation rate. The six individuals who refused to take part in the study were part of the group approached directly at the five data collection sites (one at the first public school, three at the second public school, and six at the non-government organization; no individuals approached at the church and the local public health unit refused participation). No individual identified through snowball sampling ($n = 25$) refused to take part in the study. Five out of the 140 women interviewed had missing data and were therefore excluded from analyses as per International Physical Activity Questionnaire (IPAQ) guidelines [22]. The total number included in the analysis was, therefore, 135 participants.

Data collection

Given that the annual Brazilian survey on risk factors for non-communicable diseases used a landline telephone method to collect data [5] and that the coverage of telephone lines in many areas of the country is problematic [23], particularly in low SES communities,¹ this study chose to adopt a face-to-face interview approach. This approach intended to capture a population that was likely to have been underrepresented in the national survey [24], despite evidence that low SES populations tend to be less physically active during leisure time [5, 11].

This study used the Portuguese long-version format of the IPAQ previously validated in Brazil [25, 26]. As most participants had low levels of literacy, the questionnaire was administered using a structured interview method.

Data collection was conducted by two researchers stationed in the five sites previously selected within the Cidade de Deus neighborhood. In addition, as explained above, other participants were identified through snowball sampling, and were surveyed, after providing their informed consent, at their own houses, located in different areas of the neighborhood. Data were collected between June and July 2012, on different days of the week, from 9 am to 8 pm.

Measurements

IPAQ measures multiple domains of PA, including occupational, household, transport-related (TRPA) and LTPA [22]. The measurement unit used for the assessment is MET-minutes/week [22].

Other open-ended questions were added to the survey to expand our understanding of the profile of the sample. The first question asked participants to describe their current job (e.g., cleaner, office worker, etc.) to assess better the relationship between occupation and PA. To assess the relation of economic conditions to PA levels, questions about monthly income, number of people living in the same household, employment status, etc., were also included in the survey. Also, in addition to IPAQ's self-rated health question (i.e., participants' perception of their health), participants were asked to indicate whether they had ever been diagnosed with diabetes and/or hypertension and, if so, when they had been diagnosed. The intention was to assess whether these pathologies, frequently associated with sedentary lifestyles, had an association with participating women's PA behavior.

Data analysis

Data were processed following IPAQ's guidelines [22]. After cleaning the data, the total MET-minutes/week spent in each PA domain (occupational, household, TRPA, and LTPA) was calculated for each participant. Subsequently, the total PA energy expenditure (sum of the four previously cited domains) was calculated. Because TRPA and LTPA have been shown to be the two most accurate domains assessed by the IPAQ in the Brazilian population [27], individual PA levels from these two domains, as well as their combined energy expenditure (LTPA + TRPA), were categorized into one of the three levels below, following IPAQ guidelines [22]:

- (1) Low levels of PA: individuals who did not achieve moderate or high levels of PA requirements specified below;
- (2) Moderate levels of PA: individuals who engaged in PA for 5 or more days per week, for at least 30 minutes per day and who achieved a minimum of 600 MET-minutes per week; and
- (3) High levels of PA: individuals who engaged in vigorous-intensity PA for a minimum of 3 days per week and who achieved at least 1500 MET-minutes per week, or those who engaged in different intensity PA but who did it for 7 days per week and achieved at least 3000 MET-minutes per week [22].

Posteriorly, these levels of PA were re-organized into two categories: insufficient level of PA (those previously classified in IPAQ's low level category) and sufficient level of PA (those presenting moderate or high levels of PA according to IPAQ's classification). This classification into "sufficient" and "insufficient" levels of PA followed the international guidelines suggested by the World Health Organization (2010) [4] that is used by the Brazilian Ministry of Health [5].

Demographic data were categorized to facilitate understanding factors related to PA. Age was divided into three categories: young adults (18– 40 years), older adults (41–60 years) and elderly (61–69 years). Educational level was divided into "up to primary school," "more than primary, up to secondary school," "more than secondary, up to high school," and "above high school education." Employment was organized in two categories: "employed" and "unemployed" (i.e., women who declared not having any sort of paid work, being a full-time student, housewife, or retired were grouped in the "unemployed" category; all others were included in the "employed" category). Responses to the marital status question were combined into two categories: with partner (i.e., married or living with a partner) and without partner (i.e., single, divorced, or widower). The monthly income responses were grouped by the researchers into: "no salary"; "less than minimum wage"; "minimum wage"; and "more than minimum wage".²

All variables described above were used in a multiple logistic regression model, providing odds ratios (OR) and 95% confidence intervals (CI) for variables associated with "insufficient" versus "sufficient" levels of PA as the dependent variable. Modeling started with a full model containing all independent variables described. At each step, one non-significant ($p > 0.05$) variable was dropped from the model, and the model was assessed again, until the most parsimonious model containing only significant variables was reached [28]. A likelihood ratio test was used to assess the fit of the final model.

Ethics approval

This study was approved by Southern Cross University's Human Research Ethics Committee (approval number: ECN-12-068). Written informed consent was obtained from all study participants prior to survey data collection.

Results

The majority of the sample was in what is defined in Brazil as the “economically active age” (i.e., 18–60 years), and almost half of participants ($n = 67$) were aged up to 40 years. The educational level of the study population was low, with almost two-thirds of the sample (64.4%; $n = 87$) completing only up to secondary school (see Table 7.1).

More than half of the study participants (57.8%; $n = 78$) reported having some sort of paid work, but, of those, 60.3% ($n = 47$) earned only up to a minimum wage (approximately US \$300.00 per month). From those who declared being employed, 37.1% worked as maids/cleaners ($n = 29$). The majority of participants (53.3%; $n = 72$) were married or living with a partner; 40% ($n = 54$) had three children or more, and 30.4% ($n = 41$) lived with five or more people in the same household.

The self-reported health condition of study participants was mostly “regular” (45.9%; $n = 62$) or “good” (36.3%; $n = 49$), with only a very small percentage indicating having “bad” health (7.4%; $n = 10$). Diabetes was not prevalent among study participants, with only 8.9% ($n = 12$) reporting a positive diagnosis. Hypertension was reported by over one-third of participants (38.5%; $n = 52$).

Considering the sum of the energy spent by participants in the four different domains measured by the IPAQ, the majority (87.4%; $n = 118$) of participants reported sufficient levels of PA and spent, on average, $4,040 \pm 3,278$ MET-minutes/week (95% CI: 3,487–4,593 MET-minutes/ week) on PA (Figure 7.1).

Looking at the results per individual domain, in stark contrast to the reported overall high levels of PA by the study population, the majority of participants (88.1%; $n = 119$) had insufficient levels of LTPA. Moreover, 74.1% ($n = 100$) of participating women spent no energy in LTPA, and only 25 individuals (18.5%) spent 600 MET-minutes or more per week (i.e., they achieved the “sufficient” level, the minimum public health recommendation of energy expenditure for health benefits).

In the TRPA domain, participating women were relatively more active than during leisure time. However, more than half of them (57%; $n = 77$) were insufficiently active and spent less than 600 MET-minutes/week in TRPA.

When comparing LTPA levels alone to PA levels when leisure time and transport related PA were combined, the relation of TRPA to the levels of PA became clear. The

percentage of participants that reported insufficient levels of PA dropped from 88.1% (n = 119; LTPA alone) to 43.7% (n = 59; LTPA and TRPA combined) (Figure 7.2), showing the positive relation of TRPA to the overall levels of physical activity.

Focusing our analysis on LTPA and TRPA combined, the logistic regression model showed that educational levels, marital status, number of children, number of people living in the same household, or diabetes or hypertension diagnosis were not related to PA levels of this particular population. Among the variables included in the survey, only age and engagement with paid work were significantly associated with PA levels of the study population: 76.9% (n = 10) of women aged above 60 years presented insufficient levels of PA, while only 40% (n = 49) of participants aged up to 60 years reported the same pattern (Figure 7.3). In addition, 64.1% (n = 50) of those participants who had paid work (n = 78) were sufficiently active, while among the individuals without paid work (n = 57) only 45.6% (n = 26) were sufficiently active (Figure 7.4).

In addition, results from the multiple logistic modeling that included the two variables that were significantly associated with LTPA and TRPA levels combined showed that the reference group, composed of women who were older than 60 years and did not have paid work, only had a probability of 17.2% of being sufficiently active. In comparison, the probability of a woman in the same age group but who had paid work to be sufficiently active was 29.9% (OR: 2.06; 95% CI: 1.01–4.20; p = 0.047) (Figure 7.5). On the other hand, the probability of a younger woman (i.e., women aged up to 60 years old) who did not have paid work to be sufficiently active was 49.6% (OR: 4.74; 95% CI: 1.22–18.40; p = .024), while a woman of the same age group who had paid work had a probability of 66.9% of being sufficiently active (OR: 9.76; 95% CI: 4.83–19.71; p < .001) (Figure 7.5).

Discussion

The age distribution encountered in this study sample was consistent with official data on the Cidade de Deus' female adult population [18]. In addition, the majority of the study sample (64.4%) had only up to a secondary school education, a finding also consistent with official data that indicated that the average years of education in this community's female population was just over 5 years [18]. However, while 50% of the adult population of the entire Rio de Janeiro State have completed high school or more [29], only 35.6% of the sample population had reached (but not necessarily graduated from) high school or more,

reinforcing the low levels of education encountered in this community in general and in our sample more specifically.

Other demographic characteristics of our study sample proved to be consistent with research findings from similar studies. For instance, the relation of age to PA levels has also been identified in other studies in developing countries, which showed that older individuals were less likely to be active [30, 31]. In addition to this, our findings indicated that older individuals without paid work were even less likely to be sufficiently active than those individuals in the same age group who had paid work. This result suggests that an economically active individual of this age group was more likely to be physically active than those who were retired or unemployed, which seemed contradictory to the discourse that associates a sedentary lifestyle with lack of time [32]. However, as shown before, TRPA played a larger role than LTPA in increasing levels of PA among our study population; therefore, transport to and from work, as well as mobility associated with employment, may play a significant role in maintaining high levels of PA among this subsample of this population. On the other hand, it is also important to note that older individuals are often afflicted with motor pathologies that limit their mobility and, consequently, their ability to be physically active [33]. Early intervention during adult years is therefore highly recommended to ensure long-term mobility and ability to engage in physical exercise for health promotion [34] independent of transport-related activities.

Although educational levels have been consistently shown to be significantly related to LTPA [5, 11], results from this study did not indicate such a pattern. Azevedo and colleagues' (2007) research showed that women with lower levels of education were more likely not to achieve the recommended level of LTPA [11]. The same trend was presented in the Brazilian national survey, which reported that women with 12 or more years of formal education were twice as likely to achieve the recommended levels of LTPA than those who had studied up to 8 years [5]. However, at least a couple of potential explanations are possible for the small relation of educational levels to PA patterns found in our study that should be further investigated. First, as shown above, the sample was primarily composed of individuals with very low levels of education, and therefore little variation was expected within such a sample. Second, other restrictions experienced by women within this particular community, such as lack of or low-quality sport/PA infrastructure [35] or

unavailability of sport/PA programs targeting this group [36] may have been more related to engaging in LTPA than education levels.

An important and somewhat surprising finding of this study was that the PA level of the majority of the participants (54.8%), when all domains were analyzed, was high, and that a further 32.6% reported moderate PA levels. Combined, 87.4% of participants achieved at least the minimum recommended PA level, which, according to IPAQ guidelines [22] and public health recommendations [37], is 150 minutes of moderate PA per week or 600 MET-minutes/week. Participants were, therefore, sufficiently active with only 12.6% not achieving the recommended levels of PA. This percentage of physically inactive individuals is considerably lower than the suggested 18.7% prevalence of physical inactivity in developing countries [3]. Factors that contributed significantly to this PA pattern were the tasks performed by participating women at home and at work. In Brazil, household duties are frequently performed by women, as demonstrated by Bruschini's (2007) research, which found that 90% of women compared to 45% of men reported being responsible for household tasks [38]. This is potentially one explanation for such a substantial variation in the results.

Another important characteristic of the study sample was that many participants had physically active jobs, a finding supported by research on the direct relationship between physically demanding jobs and low salaries in Brazil [39]. In our sample, for example, 26.7% of women declared that they worked as maids or cleaners, which was consistent with our findings that their high PA pattern was greatly associated with their labor activities.

However, when the levels of LTPA were analyzed independently, the vast majority (88.1%) of participants did not reach the public health recommendation of energy expenditure. Similarly, the Brazilian national survey found that only 23% of women from Rio de Janeiro achieved the recommended levels of LTPA [5]. Significantly, research has shown that engagement in LTPA is reduced among low-income individuals and that potential reasons for this are lack of economic resources, of access to leisure infrastructure, and of time (long working days, heavy workload, and/or long time spent in transportation) [40-42]. Studies have also reported that women with lower SES or living in low SES communities are even less likely than men to achieve the recommended levels of LTPA [43-45]. One possible explanation for this lower engagement in LTPA by women is the unbalanced sharing of responsibility in household and childcare duties. For instance, a study by Skowron,

Stodolska, and Shiness (2008) found that one of the most frequent constraints for LTPA participation reported by women was lack of childcare support [46].

Following a previous study that found that TRPA and LTPA were the two most accurate domains assessed by the IPAQ in the Brazilian population [27], an analysis of the PA patterns of the study participants combining these two domains was conducted. Results demonstrated that patterns changed considerably when the two domains were combined. Nevertheless, the rates of reported low levels of PA remained high: the number of insufficiently active women reduced from 88.1% in LTPA to 43.7% in LTPA combined with TRPA. However, using only the IPAQ questionnaire, we cannot assert whether the PA pattern derived by the transport-related domain was based on a conscious decision to be more active or whether it was derived from circumstantial situations. A study conducted in Australia found that factors connected to choices of being active seemed to be less important for TRPA than for LTPA for women living in low SES communities [47]. A similar pattern might be present in Cidade de Deus.

In light of the above results, it is important to highlight that the impressive rate of respondents falling within the high and moderate levels of PA categories may not necessarily translate into enhanced health or reduction of risk factors for non-communicable diseases. As mentioned above, it has been previously documented that Latin American adults, including Brazilians, tend to overestimate their occupational and housework PA when reporting through IPAQ [27]. At the same time, occupational and housework PA are less likely to bring health enhancement benefits [47, 48]. Therefore, the significance of the LTPA and TRPA domains when assessing the levels of PA for health benefits is evident. In addition, in the specific context of this research, the LTPA and TRPA domains are the ones that can be affected by the hosting of a large-scale sport event, such as the 2016 Olympic Games. The sport participation legacy cited in the candidature file of the Rio 2016 Olympic bid [15] and the urban infrastructural transformations required for hosting the games are areas, which can be planned to have a positive impact on LTPA and TRPA levels and, consequently, achieve significant health benefits for the population.

In this sense, another factor that might be related to the reported low levels of LTPA and TRPA in this population was the social and physical environment of Cidade de Deus. Research has repeatedly demonstrated that the environmental characteristics of a neighborhood (i.e., existence of PA facilities, walking and bike paths, paved sidewalks, as

well as safety and cleanliness) may affect PA patterns of the local population [49, 50]. In Brazil, similar to other countries in the developed and developing world, basic services available in low SES communities are very precarious, and the physical environment is frequently less conducive for PA engagement [35, 51]. The infrastructural and urban development enhancements promised by the Rio 2016 Olympic Games bid committee have the potential to help reduce these barriers to participation in PA significantly if they are indeed established in communities, such as Cidade de Deus, where they are most needed. However, in the Rio 2016 candidature file [15, 16], as well as other public documents circulated by the different levels of government working on “Olympic legacies” [52-54], it is not clear what the strategies are to leverage the event to increase PA/sport participation among the local population. So far, no document has been made public delineating a plan for achieving the aim stated in the candidature file of increasing PA and sport participation among low SES community dwellers in Rio de Janeiro. A potential explanation for this is that current efforts of the government focus more on building infrastructure than planning and developing strategies to use these venues to increase sport participation among the entire population [17, 36].

Strengths and limitations

This study provided a significant contribution to the field as it investigated a difficult-to-reach population that has been largely neglected or unreached in studies in this field in Brazil, providing baseline data to inform future research. However, it is important to note that the data were derived from responses to the IPAQ questionnaire and thus, as with most PA assessment surveys, were based on recall, which may not provide accurate responses [27]. This approach may also have been subject to social acceptability bias, and therefore may have limited the accuracy of the results. In addition, the study used non-random, convenience sampling, limiting the representativeness of the sample and thus the generalizability of the findings. However, demographic results suggested that the profile of the sample included in this study was representative of the Cidade de Deus population, which strengthened the generalizability of the findings presented here. Finally, the relatively small sample size may have also resulted in inadequate statistical power to detect some meaningful associations as statistically significant, and the analyses potentially inadequately controlled for confounding variables.

Conclusion

The aim of this study was to analyze the PA patterns of women living in a low SES community neighboring the 2016 Olympic Park in Rio de Janeiro. The results of the study indicate that the majority of women from Cidade de Deus reported low levels of PA during leisure time and that their PA patterns changed considerably when other PA domains were taken into account. In particular, when LTPA was combined with TRPA, levels of PA increased but remained low for 43.7% of participants. These results suggested that the commitments of the Rio 2016 Olympic Games bid committee to increase PA/sport participation and to enhance the health quality of the population living in the most disadvantaged areas of Rio de Janeiro need to be critically and effectively assessed.

Notes

1. Landline telephone ownership and connection covers less than 45% of dwellings in Rio de Janeiro low-income communities [23] and only 35.5% in Cidade de Deus [55].
2. At the time of this study, the minimum wage in Brazil was R\$ 622.00 per month (40 h/week), equivalent to US \$303.62 [56, 57].
3. The criteria used to classify an individual as “sufficiently active” were not solely based on METs but also took into consideration frequency and duration of activities.

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Table 7.1: Demographic characteristics of the participants (n=135)

Variable	(n)	%
<i>Age Distribution (41.7 ± 14.5)*</i>		
18-40 years	(67)	49.6
41-60 years	(55)	40.8
61-69 years	(13)	9.6
<i>Education Level</i>		
Up to primary school	(27)	20.0
More than primary, up to secondary school	(60)	44.4
More than secondary, up to high school	(41)	30.4
Above high school education	(7)	5.2
<i>Employment</i>		
Employed	(78)	57.8
Unemployed	(57)	42.2
<i>Marital Status</i>		
With partner	(72)	53.3
Without partner	(63)	46.7
<i>Number of Children (2.4 ± 1.8)*</i>		
No children	(17)	12.6

One child	(21)	15.6
Two children	(43)	31.9
Three children	(27)	20.0
Four or more children	(27)	20.0
<i>Income</i>		
No salary	(47)	34.8
Less than minimum wage	(8)	5.9
Minimum wage	(39)	28.9
More than minimum wage	(26)	19.3
No answer	(15)	11.1
<i>Individuals per Household (4.0 ± 2.3)*</i>		
One	(12)	8.9
Two	(22)	16.3
Three	(29)	21.5
Four	(31)	23.0
Five	(15)	11.1
Six or more	(26)	19.3
<i>Self-reported Health Condition</i>		
Bad	(10)	7.4
Regular	(62)	45.9
Good	(49)	36.3
Very good	(6)	4.5
Excelent	(8)	5.9
<i>Previous Diabetes Diagnosis</i>		

Yes	(12)	8.9
No	(103)	76.3
No answer	(20)	14.8

Previous Hypertension Diagnosis

Yes	(52)	38.5
No	(80)	59.3
No answer	(3)	2.2

Note: * Denotes mean and standard-deviation.

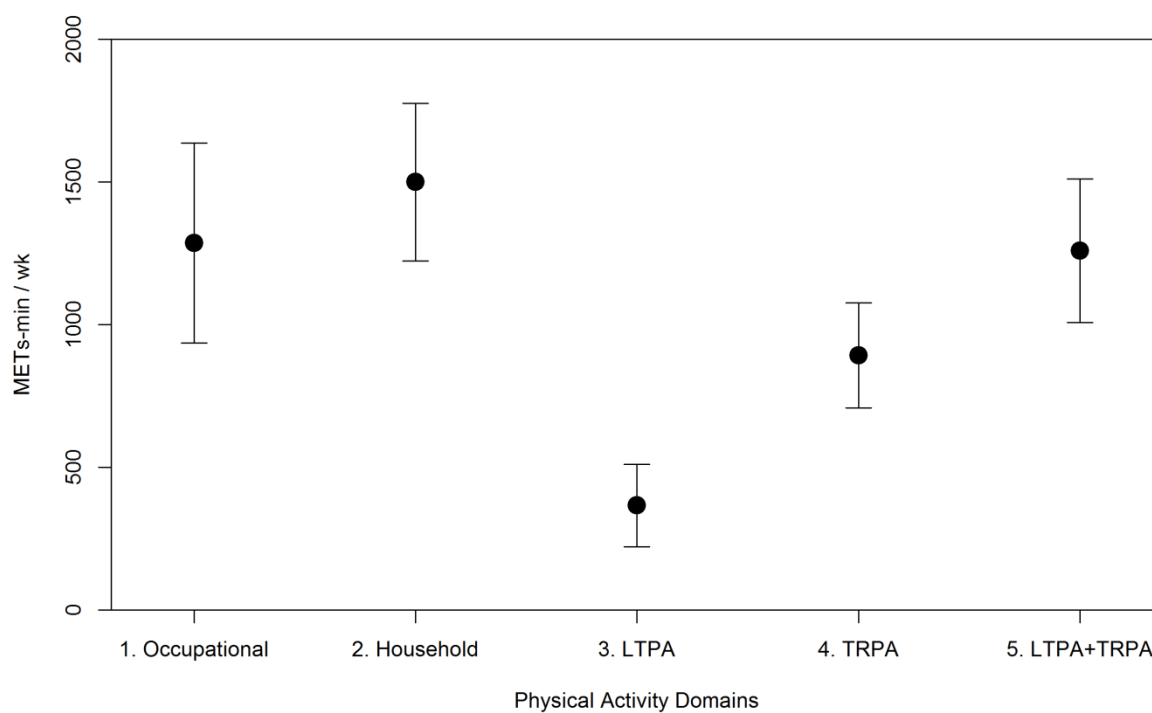


Figure 7.1: Mean energy spent in each of the four IPAQ domains, plus LTPA+TRPA combined. Points represent means. Bars represent 95% confidence intervals.

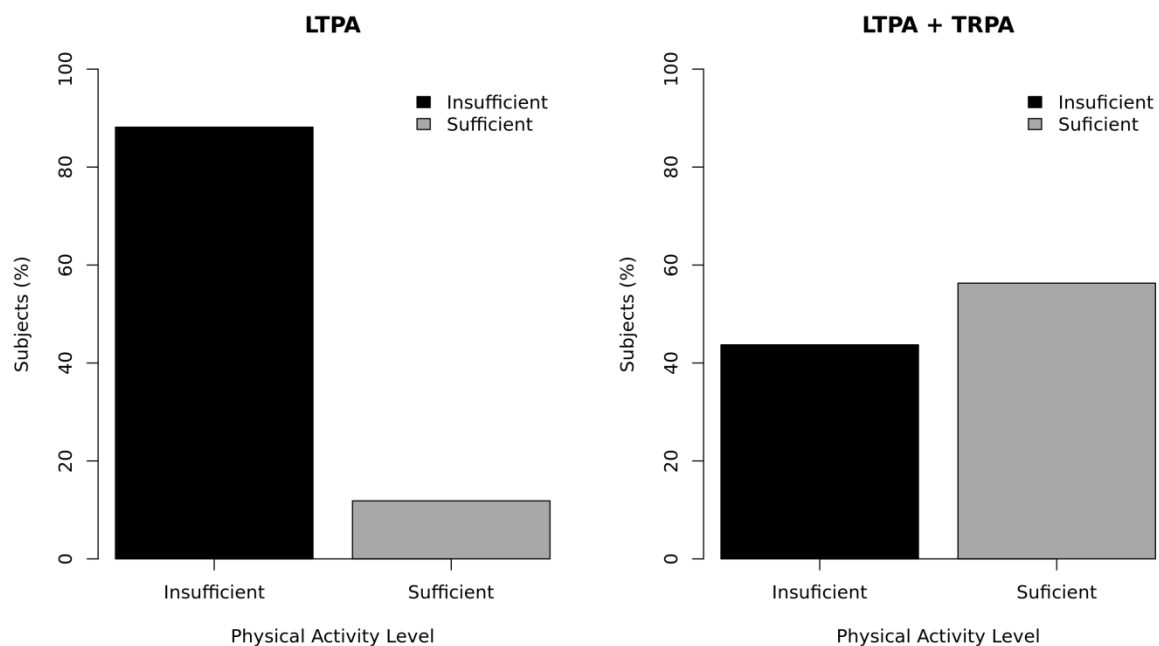


Figure 7.2 Levels of leisure-time physical activity alone, and leisure-time and transport-related physical activity combined.

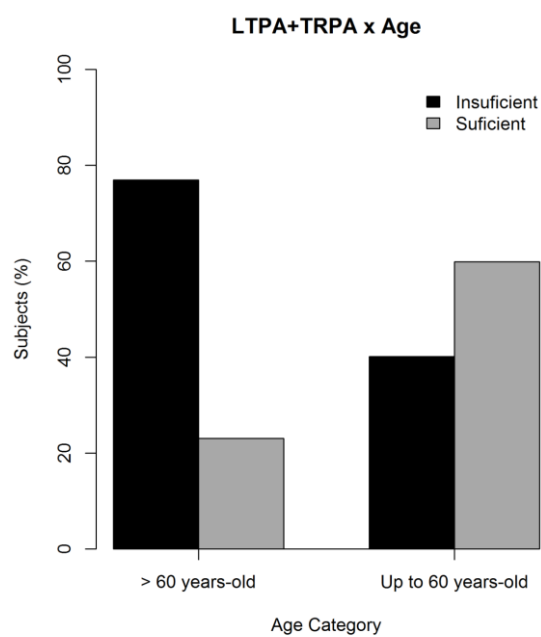


Figure 7.3: Levels of leisure-time and transport-related physical activity combined and according to age category.

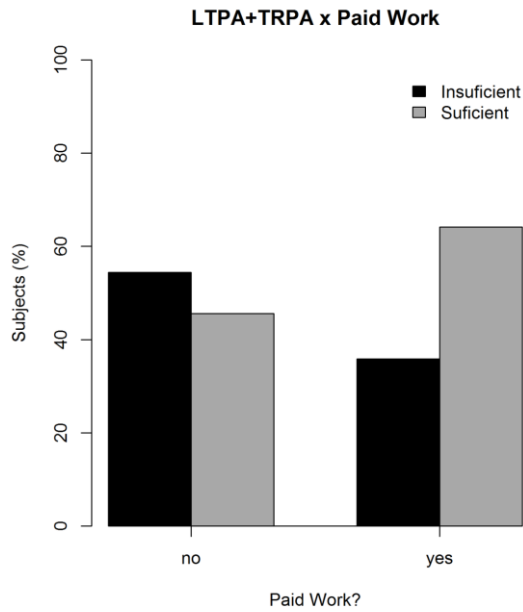


Figure 7.4: Levels of leisure-time and transport-related physical activity combined and adjusted for work status.

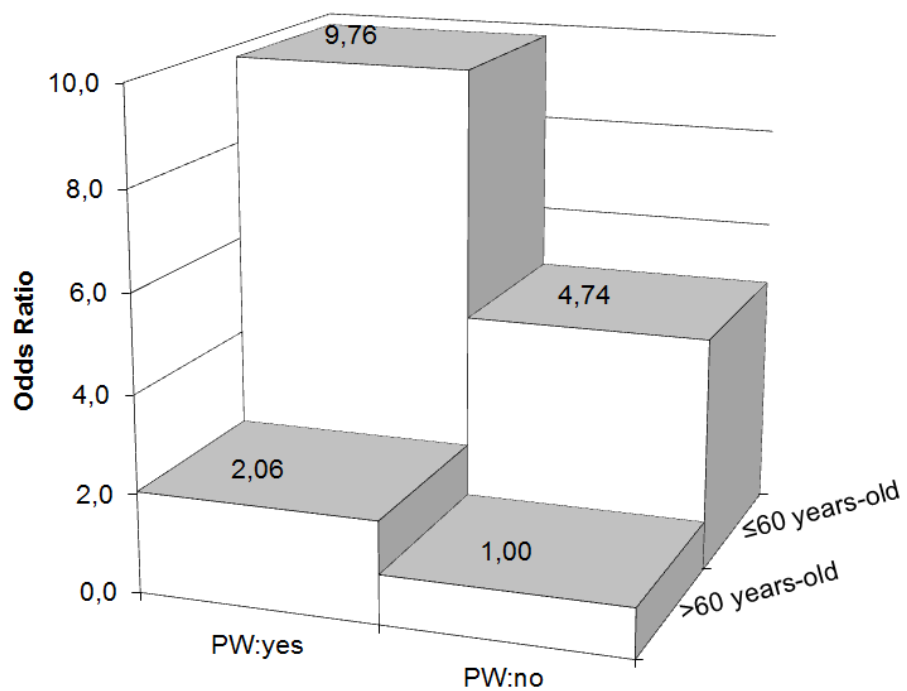


Figure 7.5: Odds to become sufficiently active depending on the age category and paid work status, compared to a non-paid work and older person.

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CHAPTER 8

Health and Sport Legacies of the Rio 2016 Olympic Games: The Perceptions of Women from a Low-Income Community

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Health and Sport Legacies of the Rio 2016 Olympic Games: The Perceptions of Women from a Low-Income Community

Abstract

Recently, health promotion efforts worldwide have focused on leisure time physical activity (LTPA). At a structural level, sport mega-events have been claimed to contribute to increasing participation in LTPA among host residents. Significantly, little research to date has focused on how low socio-economic status (SES) communities have been impacted by these events and by the health promotion discourse associated with them. This paper intends to reduce this gap in knowledge by discussing the physical activity (PA) participation legacy of the Rio 2016 Olympic Games as perceived by 30 resident women from a local low SES community. Findings suggest that their understanding of health is related to more acute needs, such as access to sewage and healthcare, and therefore the Olympic Games are not easily associated to health benefits. Significantly, results suggest that low SES communities in Rio de Janeiro are not aware of what the Olympic Games are, despite the event's clear physical presence in their lives through urban changes. We conclude that in the context of a developing nation ripe with extreme inequalities the Olympic Games and their potential public health legacies are part of a government discourse that is too alien to the realities of low-income populations.

Keywords: Rio de Janeiro, health promotion discourse, health legacy, low-income communities, women, Olympic Games

Introduction

Public health discourses worldwide have constantly emphasized both the importance of physical activity (PA) for health improvement as well as the damaging effects of physical inactivity [1, 2]. A special focus of health promotion efforts in recent years has been on leisure time physical activity (LTPA); research suggests that this is the most effective activity domain for health enhancement, surpassing occupational, household and transport-related PA [3, 4]. Research has also shown that LTPA is very sensitive to certain social and personal characteristics such as gender, level of educational attainment and socio-economic status, as

well as structural ones, such as the physical environment in which one lives and the public policies and programs in place for the local population [5-7].

At a structural level, sport mega-events have been claimed to provide a good opportunity to increase participation in LTPA among host city residents [8, 9]. However, to date, research has not found clear evidence that associates the hosting of these events with improvements in LTPA participation levels [10-13].

Significantly, little research to date has focused on how mega sport events PA participation legacies have affected the population of low socio-economic status (SES) communities [14]. This paper intends to contribute to reducing this gap in knowledge by discussing the PA participation legacies of the Rio 2016 Olympic Games as perceived by residents of a local low SES community. In particular, this study focuses on how women living in a marginalized community of Rio de Janeiro have been impacted and what their perceptions are regarding the Games' contribution to improving their health and PA participation levels as well as that of their community.

Physical (In)Activity in Health Promotion Discourse

The rising mortality and morbidity rates associated with non-communicable diseases in both developed and developing countries has led to the production of a series of documents and recommendations to improve individual health worldwide [1, 2, 15]. Significantly, health agencies have focused their attention on some risk factors more than others, and among them are unhealthy diets and physical inactivity [16-18]. When it comes to physical inactivity, most health promotion campaigns worldwide have taken a medical approach focused on individual behaviour and lifestyle, and it is argued that these campaigns disregard cultural or socioeconomic issues that have been shown to strongly promote sedentary behaviour [19, 20].

Importantly, Fullagar (2002) argues that health policy discourses that promote lifestyle changes based on individual behaviour aim to mobilize individuals to govern themselves in the name of freedom and choice, producing norms about the individual responsibility for healthy living [20]. Crawford (as cited in Wright, O' Flynn & Macdonald, 2006) labelled this relationship between health and normality as 'healthism', with individuals having the obligation of monitoring their own health constantly and mediating and investing in a lifestyle that is health-enhancing and can prevent illness [21].

As a case in point, Ayo (2012) critically analysed health promotion strategies based on healthy lifestyle (such as active living) in Western countries [22]. The author found that current health promotion policy and practice tends to ignore all major social determinants of health, and renders ill health to poor personal choices made by freely choosing citizens.

Importantly, this biomedical expert language has powerful bio-political effects [20]. From a Foucauldian perspective, power, truth, and knowledge are created collectively through forms of discourse [20]. These discourses are not liberating or repressive per se, but represent a different deployment of knowledge and power [23]. The relationship between knowledge, power, truth and the political-social interests of those who create and maintain certain discourses is crucial to the elaboration of dominant discourses [24].

It is important to note that Brazil also has been influenced by the Western discourse and practices of health promotion. Malta et al. (2009) report that in Brazil, since 2005, many health promotion events, projects, programs and policies have focused on PA as an important strategy for improving the health of the general population [25]. Bagrichevsky & Estevão (2005), Ferreira, Castiel & Cardoso (2012) and Teixeira (2009) agree and assert that health promotion campaigns based on healthy lifestyle discourses have strategically reinforced the message that it is a personal choice to be unhealthy [19, 26, 27]. The use of such blameful discourse is a way of suggesting how health policies work while disregarding the health implications of the countless social and economic problems experienced by the Brazilian population. It reduces the responsibility of governments and other stakeholders to enact social changes that effectively influence a sedentary lifestyle.

Significantly, Fraga (2005) argues that individuals who have been deemed as sedentary are usually those who, for a long time, have been positioned as ‘problematic’ population groups, such as individuals on a low income, members of ethnic minorities, those with low levels of education, and women [28]. It is to the latter group that we will turn our attention now.

Women, Health and Physical Activity

Fullagar (2003) questions the current gendered construction of active leisure in such discourses that universalize masculine experiences as the norm for healthy living, highlighting that the biomedical and epidemiological discourses of health risk embedded in health policies do not contextualize the meaning and construction of women’s active leisure

[29]. In fact, several authors have argued that many public health programs are symptomatic of a dominant medical culture that is moralistic, sexist and class prejudiced [30]. As a case in point, Fullagar (2003) analysed health promotion campaigns and reports in Australia and found paternalistic tones embedded in all of them [29]. In health agencies' reports, gender was conceptualized as a barrier that prevents women from participating in active leisure on equal terms with men, and hence assumes a masculine norm [29]. The broader socio-political inequities that women experience in relation to household roles, work and leisure are described merely as barriers to participation in PA and are separated from the complexities of everyday life, not taking into consideration power relations that govern and connect such barriers [29]. As such, health policies perpetuate a 'one-size-fits-all' approach to active living; that is, health promotion campaigns aim to enhance participation in PA without problematizing gender differences and power relations [29]. Similarly, Moore (2010) found that health policies in the UK were directed first and foremost at mothers, consequently giving women the burden of health promotion on behalf of other family members [31].

Fullagar & Brown (2003) highlight that policies and health promotion campaigns play an important role in governing the population through calculative discourses that employ leisure time as something to be measured and managed effectively in order to improve health outcomes [32]. According to Fullagar & Harrington (2009), a governmentality perspective enables us to consider how leisure, PA and lifestyle as objects of health promotion interventions are articulated through particular discourses that shape our thinking about risk, morals and conduct [33]. Rather than assume the 'state' is a singularly powerful governing entity, Foucault argues that power is dispersed through a range of state-funded, third-sector, and allied agencies that 'govern at a distance' [33]. Markula (2003) complements the argument by reminding us that power is not isolated in a specific social sphere (i.e. political or economic), but it is spread through society in a variety of institutions and individuals [23]. The ways in which healthy living is promoted by different agencies as a legacy of the Olympic Games and how different population groups perceive the enactment of these messages will be our next focus.

The Trickle-Down Effect of the Olympic Games and Health Promotion

Research focused on sport, PA and health legacies of the Olympic Games has expanded in recent years as governments increasingly justify their high investments in sport mega-events as a way to encourage the population to become more physically active [34]. However, to date, studies have not found clear evidence of a positive impact of the Olympic Games or other major sport events on sport/PA participation [11, 35]. Nonetheless, governments worldwide continue to assert that promoting elite sport will contribute to rising participation in sport [34, 36]. In this sense, the positive PA legacy of major sport events is based on a “trickle-down effect” discourse – that successful performance by elite athletes will benefit the broader community in the form of increased interest in sport and, as a consequence, increased participation. However, research findings have contradicted the trickle-down effect showing, for instance, that events such as the Olympic Games tend to serve as a stimulus only for those who are already involved in sport [37-39]. Indeed, Coalter (2004) argues that the elite sport role model is not effective for encouraging mass sport participation and that the Olympic Games should be just one strategy in a much broader long-term development program for increasing PA participation [40].

The London 2012 Summer Olympic Games were the first to provide a plan for the delivery of sport and PA legacies to the host community [41]. In official documents of the London 2012 candidature, the trickle-down effect discourse was highlighted, with assertions that hosting the Olympics would inspire a generation of youth to increase sporting activity [42]. Following a similar pattern, the Rio candidature for hosting the 2016 Olympic Games also used the trickle-down effect discourse to substantiate the promotion of its PA participation legacy, with the *Candidature File* [43] describing as sport legacy mostly infrastructural improvements in high performance sport venues and financial investment in elite sport.

To understand the tensions between notions of elite sport achievement and the assumed unproblematic legacy of widening sport participation, it is again important to understand how power and knowledge are connected and embedded in such a discourse. Piper & Garret (2013) argue that the Olympic legacy discourse has the ability to enunciate, name and describe situations in order to bring into existence particular ideas, ambitions and contemporary practices [44]. For these researchers, the International Olympic Committee (IOC) is a 'transmitting authority' that now expects legacies to be manifested in Olympic

candidatures even when a bid is unsuccessful. “In Foucauldian terms, this suggests power and knowledge are manufactured by knowledgeable experts who are able to ask the right questions and further understand the terms of reference, in order to influence prospective bids and help organize future practices” [44, pp.2].

Importantly, this paper intends to show how the messages of active living promoted in the sport legacy discourse of the Rio de Janeiro 2016 Olympic Games have been experienced by women from a low income community. To that end, we investigate whether the message of active living as a way of promoting health has impacted the lives of these women. We argue, following a Foucauldian perspective [45, 46], that there is a dominant health discourse that is promoted by different agencies, is supported by scientific knowledge and has power to undermine/hush other health discourses.

A particular case of women from a low SES community

Cidade de Deus is a low SES neighbourhood in the western region of Rio de Janeiro city. It is the most populated low income community located in the vicinity of the Olympic Park, and experienced significant urban transformations in the years leading up to the Olympic Games in August 2016. It has 36,515 inhabitants with 53.5% being under 30 years of age, approximately 38% being adult females, and 63% of the households being led by women [47, 48]. Cidade de Deus ranks 26th in Human Development Index among the 33 administration regions in the city of Rio de Janeiro [48, 49].

In relation to health, Cidade de Deus ranks second in infant mortality among all Rio de Janeiro communities [50]. According to Cardoso, Ávila, Ferreira, & Pereira (2009) more than 30% of children from Cidade de Deus have malnutrition problems and are likely to keep this pattern for the rest of their lives [51]. Other critical health problems identified by the authors were the low number of doctors and health care centres within the community, the high rates of death by firearm in its young population, and high rates of youth pregnancy and caesarean delivery compared to surrounding neighbourhoods. A recent study found that 88.1% of Cidade de Deus women report not achieving sufficient levels of LTPA, and 74.1% declared not spending any energy at all in LTPA [52]. Concerning PA and sport opportunities, the community presents low numbers of sport and PA programs/projects and low quality sport facilities [51, 53, 54].

Methods

Data were collected in July 2013 within the boundaries of Cidade de Deus. A community member helped with the recruitment of an initial selection of 15 women aged 18 and over, residents of Cidade de Deus. Through snowball sampling technique [55, 56] other women were invited to take part in the study. In total, 34 women were invited and 30 accepted to participate. Participants were aged between 24 and 73 years, and were mostly long-term residents of the community (average of 32 years). Their professional status varied from students to small business owners, housewives, unemployed, retired, and working in informal services (e.g. street vendors).

A semi-structured interview schedule was prepared and tested prior to the commencement of the study. During interviews women answered questions about the meanings they attached to health, their needs concerning health and PA, described their and the community's health conditions, their PA behaviours and the opportunities for practicing PA in their community, and shared their expectations of the Olympic Games. Thus, a focused interview approach was conducted in this study in order to gain specific information and explanations [57].

The interviews were conducted and analysed in Portuguese. All interviews were recorded digitally, transcribed verbatim, and the relevant quotes translated into English for the purpose of representation in this paper. The first author conducted the first phase of the interview analysis, where she identified the main themes emerging from each of the focus areas of this study. After this process, the second author revised the material, reading notes, quotations and transcript material, and a series of discussions and reinterpretations ensued.

A thematic content analysis approach [58] was used to code the interviews, and therefore, new themes were added to previously developed themes (i.e. focus areas). This coding procedure has conventionally been used for the classification of research data into categories [59], and serves as a starting point for discourse analysis [60]. A Foucauldian Discourse Analysis (FDA) was employed to analyze the coded data from interviews [45, 61, 62] in order to discuss how power and knowledge [46] of the international health promotion discourse which was embedded in the health and sport/PA legacies discourse of the 2016 Olympic Games have impacted the perceptions of women from Cidade de Deus concerning health and PA participation. The material presented herein reflects what the authors considered the main findings of the study.

Results and Discussion

In this section findings from interviews will be presented and discussed under three headings: The meaning of the Rio 2016 Olympic Games; The impacts of Rio 2016 on health, and; The impacts of Rio 2016 on PA participation.

The meaning of the Rio 2016 Olympic Games

Despite the Summer Olympic Games arguably being the biggest sport event in the world, women from Cidade de Deus were not aware of what they were in practice:

“I have no idea!” [Vitória¹, 60 years old]

“This thing, I don’t know anything about this thing. I can’t say much because I don’t know about this Olympic thing. I don’t like these things, no.” [Jacira, 48 years old]

Moreover, most of them got the 2016 Olympic Games and the 2014 FIFA World Cup mixed up, probably because the latter was coming to their city first, in the following year, and they were both ‘just’ large sport events that were being used to justify the phenomenal infrastructural changes being experienced throughout the city. These findings suggest how low income members of this society are completely disfranchised and marginalized, to the point of not even recognizing one of the major symbols of the modern era [63].

Importantly, the participants’ perceptions of hosting large sport events as being connected to the misuse of public money and corruption might be related to residents’ previous experience as recent hosts to other sport mega events. A study conducted in Rio de Janeiro suggested scepticism by sport and PA professionals of the potential of Olympic legacies, and also highlighted corruption and misuse of public resources as major impediments for positive legacies to unfold [64]. Nonetheless, support for such events was successfully gained and the legacy discourse was used to enunciate, name and describe only positive impacts without showing clearly the oft reported unbalanced costs and benefits of hosting sport mega-events [65, 66].

Several participants also declared not to be interested at all in these sport events, because it was felt they were a waste of public money and connected to political corruption.

¹ Pseudonyms are used to ensure participants’ anonymity.

“For me [these events] are nothing. Just another way of robbing the people.” [Beatriz, 24 years old]

“I only know about how much money the government is spending, that’s all. Nothing else.” [Rosangela, 27 years old]

“Oh yes, yes, that the mayor and the governor are making huge loads of money, with some renovations for the tourists to enjoy.” [Samanta, 51 years old]

The quotes above attest to the absence of participation at a population level in the processes leading to the nomination of Rio de Janeiro as a host city. However, despite their unawareness and disinterest, mega sport events have been hosted frequently in the city for the past 10 years (i.e. the 2007 Pan American Games, the 2011 World Military Games, the 2013 FIFA Confederations Cup and the 2014 FIFA World Cup), suggesting therefore the high commitment of the Brazilian governments in supporting sport events, despite investments of scarce public resources in such events not being a high priority for local residents.

Impacts of the 2016 Olympic Games on health

The positive sport and PA legacies of the 2016 Olympic Games described in the candidature file and promoted by the federal, state and local governments had not yet been perceived by women from Cidade de Deus as an opportunity for health improvements. Furthermore, they declared that the health system in their community and in the city in general had become worse in recent years, making perceptions of the Olympic Games negative, as participants felt that the money used to support the Games was taken away from the health sector:

“They are spending our money. I mean, they should spend more on health, education – they are so deteriorated. Particularly in health and education. How do they want to do this [event]? They should first improve health and education, and then think about this [Olympic Games].” [Marlene, 50 years old]

“Nothing. It has not contributed to anything. I haven’t seen any improvements. Not in health and not in the sports side of things, because there’s nothing [being done].” [Soraia, 35 years old]

The statements above suggest that the health promotion discourse based on active living promoted by different stakeholders of sport mega-events is not the strategy expected by these women to address their health needs. Instead, they expect public resources to be spent tackling the most urgent health and educational needs of the local population. As Ayo (2012) argues, current health promotion discourses and practices pay little attention to the prerequisites of good health [22]; in the case of our research participants, direct investments in the public health system, education and also in providing sport facilities and programs. In this context, it seems clear that the health promotion discourse based on active living is not suitable to reach and change the lifestyles of those who are acutely impacted by other more immediate health needs.

It is important to note that despite women from Cidade de Deus not perceiving positive changes in theirs or their community's health as a consequence of hosting the 2016 Olympic Games, the Brazilian government and allied stakeholders have succeeded in promoting the discourse of active living as a vector for a healthy life, and therefore have used biomedical expert language to govern the way the population views health [20]. In the Cidade de Deus' context, the active living discourse seems to have penetrated everyday lives, and have helped shape women's health narratives. When asked about what people should do to be healthy, the vast majority of participants answered that it is necessary to exercise:

"Doing exercise, which I don't. Don't smoke, don't drink, which I don't do – I don't smoke or drink. And eat well." [Diva, 30 years old]

"Mainly physical exercise and a good diet. This is what is most important to have a healthy life." [Gabriela, 51 years old]

"Eat better, exercise." [Elisa, 38 years old]

The quotes above illustrate how this health promotion discourse has been successful in minimizing the relevance of many socio-economic issues that might impact more on the health of this population than physical inactivity. Moreover, the active living discourse transfers the responsibility of attaining good health to the individual, despite research constantly demonstrating that LTPA participation is directly related to socio-environmental factors as well as public sport policies and practices [6, 7]. Importantly, the active living

discourse has been perversely overvalued in nations where health problems are as basic as having access to doctors and hospitals:

“I think health should be the priority but it is very precarious at the moment, particularly here at the health centre, it’s a total chaos. We get there and, unfortunately, there’s only paediatrics in the morning.” [Gabriela, 51 years old]

“Here in Cidade de Deus? In general, right? Because here or nowhere there’s anything. We need an emergency, there isn’t one. When there’s a paediatrician at the public health centre there is only one to look after everyone, there’s no way. We can arrange a consultation but it’s only for 3 to 4 months.” [Soraia, 35 years old]

The two sets of quotes above illustrate the conflict between their lived experience of disfranchisement and lack of access to resources – including to good quality healthcare services – and the power of the established discourse in shaping their own views about health and healthy living, a message that is constantly promoted in health promotion campaigns across Brazil [19, 26, 27].

Importantly, as discussed above, this kind of discourse strongly orients the way people should behave in order to contribute to a healthy society, being therefore a mode of governance [20]. In the case of women this mode of governance is even worse, given that these discourses often imply blame without questioning the cultural and socio-economic conditions that contribute to lower PA participation among women [29, 32].

“Improvements for health as well, right? Walking. At the moment, I don’t do much walking. Exercise, going to the gym... there’s a gym for the elderly over there, that I could go to, but I don’t because I take the kids to the pre-school, clean the house, then when I realize I have neglected that...” [Paula, 35 years old]

“Nowadays physical activity is not just for aesthetics, it’s part of being healthy. In my case, I don’t do anything, but I should, because of my high blood pressure.” [Pamela, 32 years old]

Arguably, this feeling of guilt experienced by women from Cidade Deus is an expected consequence of the messages disseminated by the active living discourse that is based around the notion that it is an individual’s choice to be (un)healthy, and consequently contribute to shaping the attitudes of these women in regards to risk, morals and conduct

[33]. The embarrassment expressed by the participants when describing themselves as someone physically inactive is, therefore, a result of notions of health and normality embedded in current public health discourses and practices that condemn individuals for their inability to prevent illnesses and avoid risk factors [21].

Impacts of the 2016 Olympic Games on physical activity participation

When participants were asked about opportunities to practice sport and PA in their community, the answers ranged from no perception of change to some small changes, such as modest refurbishment of facilities and availability of new sport/PA programs within the community.

“So, they have started on the public squares recently. They are getting one together over there and it will have a cemented football court. [...] But it’s not just one public square that will fix things. We need other spaces, because there are a lot of spaces with nothing there. They could fix them so the kids are not idle.” [Helena, 62 years old]

“The things [equipment] for the elderly were already there a long time ago. There were public squares before this Olympic thing. To me, nothing has changed. There is much to change but unfortunately [nothing has changed].” [Laura, 45 years old]

The quotes above go against claims of trickle-down effects and their consequent sport participation legacy for the whole population. Similar feelings were expressed by families living outside of London, who reported many barriers to engage in sport and PA despite the recent 2012 Olympic Games in the region [37].

Importantly, even those respondents who asserted having perceived some improvements in opportunities for sport/PA engagement within their community were also concerned about the continuity of such developments after the Games. Discontinuity and instability in the development of sport programs/projects is a recognized problem in Brazil and an already expected outcome of any intervention that is publicly funded [64]. A previous study conducted in Cidade de Deus found that sport programs financially supported by governments and spread across the city/country have no long-term focus or commitment [53].

“They will build [new facilities], they will create new programs, they will build new football courts in the public squares, a heap of things. I just want to see if they will give continuity to these projects. It’s useless to build a public square or stadium today and then abandon it, not letting anyone use it.” [Alice, 30 years old]

“Programs will ‘sprout’, but with day and time to finish.” [Dilce, 28 years old]

Participants’ concerns about the lack of long-term maintenance of the Rio 2016 sport infrastructure and the availability of these facilities for public use after the event seems to be well founded. Since the conclusion of the Games, Brazilian media have repeatedly reported that sport facilities built for the 2007 Pan American Games, the FIFA World Cup and the 2016 Olympic Games have become white elephants or have been rarely used [67-69].

It is interesting to note that some participants reported a perception that the Olympic Games could motivate participation in sport and PA. However, they also highlighted that long-term participation in sport and PA needs to be supported by the availability of appropriate infrastructure and projects inside their community, again challenging the “trickle-down” effect discourse.

“To practice sport now is trendy. Everyone wants to be an athlete. [The Olympic Games] do influence, but the gap between being motivated, wanting to do that, and you being able to do it, is very big. Here in Cidade de Deus there are no such spaces [for sport/PA practice]. We have requested several times through the popular committee but nothing ever came through.” [Marilucia, 57 years old]

It seems clear that strategies for increasing sport participation among the general population cannot rely on hosting mega sport events and on elite athletes’ achievements as supported by the “trickle-down” effect discourse, and therefore need to be well planned and receive financial and political support in order to contribute for changes in lifestyle and produce long-term benefits that might impact positively on the health of the population. Strategies to increase sport/PA participation in low SES communities are even more complex, given these communities tend to suffer from a lack of basic public services that have a direct impact on regular participation. Prior et al. (2014) argue that to increase rates of PA participation in areas of multiple deprivations it is necessary to move beyond the behavioural approach and take into consideration the social, political, and material context in which sport/PA programs/projects occurs [70]. The strategies proposed by Coalter (2004)

for increasing sport/PA participation in an Olympic city seem to not have yet been implemented in Cidade de Deus [40].

Conclusion

Findings of the present study show that women residents of Cidade de Deus had not perceived any benefits from the Olympic Games in the lead-up to the event, particularly as they related to the sport and PA participation legacies promoted by organizers and government officials. Significantly, the socio-economic marginality of research participants was evidenced by their lack of awareness of the 2016 Olympic Games that was soon to take place in the vicinity of their homes.

Despite their marginality and lack of awareness of what the Olympic Games are and what they stand for, the health narratives of women from Cidade de Deus are still highly framed around international health promotion discourses of active living and, therefore, have contributed to governing their understanding of health and their presumed responsibility for their good health. Such a perspective demonstrates how the active living discourse has been overvalued in Brazilian public policy and how health promotion strategies supported by governments, which have in recent years incorporated the hosting of mega sport events, have mainly focused on individual behaviour change. Importantly, this super valorisation of the active living discourse provides evidence of the neoliberal rationality embedded in health policies and practices that disregard the socioeconomic determinants of health.

Significantly, the active living discourse also embedded in the “trickle-down” effect idea does not seem to be relevant to the day-to-day reality of women from Cidade de Deus. The chaotic health services available to this community as well as the socioeconomic disfranchisement of these women prevents them from making a feasible connection between hosting sport mega events and public health improvements through sport/PA participation.

Finally, it is not the intention of this study to generalize results; however, it is argued that these findings provide an important step in reducing the gap in knowledge about health and sport legacies of mega sport events. Significantly, studies giving voice to the host population and to marginalized groups need to receive considerably more attention from the academic and non-academic communities.

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CHAPTER 9

Synthesis, discussion and perspectives

Research worldwide has long reported the positive impacts of regular participation in physical activity (PA) as well as the harmful impacts of physical inactivity on health [1-5]. At the end of the last century, public health recommendations on types and amounts of PA for health enhancement and disease preventions was published and internationally recognised and validated [1, 6, 7]. Nevertheless, despite this consolidated knowledge, the majority of the world's population do not achieve the recommended levels of PA [1, 8] and some population groups, such as, women and low socio economic status (SES) individuals have often been reported as having low levels of PA [7-10]and, consequently, a higher probability of poor health [11, 12].

Significantly, researchers across the world have challenged public health policies focus on changing individual lifestyle as the best way for health enhancement, advocating that social, economic and cultural issues have a great impact on health. Their studies have shown that physical environment (i.e. physical activity resources – PARs), public policies, individual SES level and culture are important factors that play an enormous role in determining health and well-being [13-19]. All these issues were reviewed in-depth in the chapters 1 and 2 as well as some of them being empirically examined in this study and presented in the chapters 5, 6, 7 and 8 of this thesis. Now the main findings of the 4 empirical studies are briefly presented below, since they have been discussed at length in their respective chapters.

Summary of the main results

***Aim 1:** The aim of the study 1 was to discuss how the Brazilian government has been delivering sport and PA opportunities to Brazilian society, and the extent to which people are benefitting from the current scenario of increased government interest in sports. Specifically, the main objective of this study was to identify to what extent low SES communities have*

gained a sport and PA participation benefit from the plans to host sport mega-events in Rio de Janeiro.

After analysing three sport and leisure-time physical activity (LTPA) projects/programs, including the Segundo Tempo, PELC/PRONASCI and Academia na Praça projects/programs developed by and/or implemented with the support of the Brazilian federal government, that was in operation or had been recently terminated its activities in Cidade de Deus, a low SES community in Rio de Janeiro, the findings of the study 1 (available in the chapter 5 of this thesis) indicate that two key issues limit the delivery of efficient sport policies in this community: the instability/continuity and the “sub-contractual” nature of the sport and LTPA projects/programs.

Instability/continuity of sport projects/programs is a recognised problem, nationally and internationally [20-23], and the main reason for this is that government funded projects/programs are subordinated to political wills and are often impacted by every new election [24], especially in Brazil (the host of 27 political parties). Therefore, sport projects/programs supported by governments and delivered to Brazilian society are not part of an apolitical national sport policy with support of all levels of government and all political parties [25]. Significantly, the issue of instability/continuity was experienced by the Cidade de Deus community in two of the three sport and PA projects/programs examined there.

The second problem that affected the delivery of effective sport policies in the Cidade de Deus community is the “sub-contractual” characteristic which is experienced by the *Academia na Praça* project. This project is financially supported by a private bank and is delivered by a non-governmental organization, and therefore, the government's constitutional responsibilities were totally transferred to the non-governmental sectors. Importantly, the “sub-contractual” nature of the sport and PA projects/programs exacerbate such problems as discontinuity since a long-term commitment is not required. The uneven delivery arises from the main interest of private business being the high visibility of the project, thus small-scale projects and communities are at risk of not being supported; and finally, accountability and consistency in content being delivered may be guided by the interest of the private or third sector institutions and not by the needs of the population.

Aim 2: *The main objective of the study 2 was to evaluate and discuss the quality of public Physical Activity Resources (PARs) available in a low SES community (Cidade de Deus) in the Olympic city of Rio de Janeiro.*

The physical activity resource assessment (PARA) [26], an observational tool, was used to assess the quality of all public PARs existent in Cidade de Deus community and it was the study 2 of this thesis, available in chapter 6. The findings of study 2 suggest that the quality of Cidade de Deus' PARs is very low, with quality indicators (QIs) ranging from -8 to 18 points and the possible minimum and maximal values for QI were -36 and 75, respectively. The average QI of the PARs accessed was 1.3 ± 6.40 and the median was equal to 1 point. With the exception of one group of PARs (group 3), which presented the praças (traditional PARs in Brazil that provide opportunities for passive and active leisure) [27] with the highest QI, groups 1 and 2 attaining negative mean scores. Importantly, incivilities were the most important variable for the low quality of PARs in Cidade de Deus. Nevertheless, low scores were also found in the features and amenities of PARs in groups 1 and 2, which suggests that the LTPA infrastructure in Cidade de Deus is generally not available or not in good condition to be used.

Aim 3: *The aim of the study 3 was to analyse the current PA patterns of women living in the Cidade de Deus neighbourhood, a low SES community located in close proximity to the 2016 Olympic park.*

The study 3 of this thesis, available in chapter 7, used the International Physical Activity Questionnaire (IPAQ) to disclose the PA patterns of women who live in the Cidade de Deus community. An interesting finding was that the majority (54.8%) of participants reported high levels of PA. Furthermore, considering the sum of the energy spent by participants in the four different domains measured by the IPAQ (i.e. occupational, household, transport-related and leisure-time PA) [28], the majority (87.4%; $n = 118$) of participants reported sufficient levels of PA and spent, on average, $4,040 \pm 3,278$ MET-minutes/week (95% CI: 3,487–4,593 MET-minutes/ week) on PA. However, the occupational and household PAs were the two domains which contributed most to this pattern.

Significantly, looking at the results per individual domain, it is possible to identify a stark contrast to the reported overall high levels of PA, and therefore, 88.1% of participants reported low levels of PA during their leisure-time. In addition, 74.1% ($n = 100$) of participating women spent no energy in LTPA, and only 25 individuals (18.5%) spent 600 MET-minutes or more per week, achieving the minimum levels of PA for health benefits.

In the transport-related physical activity (TRPA) domain, participants were relatively more active, but more than half of them (57%; $n = 77$) spent less than 600 MET-

minutes/week in this domain, and were insufficiently active. However, when comparing LTPA levels alone to TRPA and LTPA levels combined, the influence of TRPA to the levels of PA became clear. The percentage of participants that reported insufficient levels of PA dropped from 88.1% (n =119; LTPA alone) to 43.7% (n = 59; LTPA and TRPA combined) showing the positive relation of TRPA to the overall levels of PA. Importantly, the results highlighted the discrepancies between different PA domains and suggest that the participant women engaged little in PA during their leisure time.

***Aim 4:** The aim of the study 4 was to discuss the PA participation legacies of the Rio 2016 Olympic Games as perceived by women residents of Cidade de Deus neighbourhood. Particularly, this study focused on how women living in this community have been impacted and what their perceptions are regarding the Games' contribution to improving their and their community's health and increasing LTPA participation.*

In study 4, presented in the chapter 8 of this thesis, interviews with women from Cidade de Deus were conducted. The results of interview analysis showed that women from this community were not fully aware of what the Summer Olympic Games means in practice. They also confounded it with another sport mega event, for instance the 2014 FIFA World Cup, which took place in Rio de Janeiro, two years before the 2016 Olympic Games. Furthermore, many of the study participants also asserted that they were not interested at all in sport events, because they perceive the hosting of large sport events as a waste and misuse of public money and connect these events with political corruption.

Concerning the impacts of the 2016 Olympic Games on the health of the Cidade de Deus residents, the participant women perceived the Games as something negative for the public health sector, and consequently, for their health and their community's health. Importantly, the women from Cidade de Deus suspect that public money used to support the 2016 Rio Olympic Games was taken away from the health sector. In addition, the statements of these women suggest that the health promotion discourse based on active living which has been promoted by different stakeholders of sport mega-events is not the strategy expected by these women to address their health needs, and they preferred public resources to be invested in the most urgent health and educational needs of the local population. However, it is important to note that despite the participating women perceiving negatively the impacts of the 2016 Olympic Games on health, their health discourses have been impacted by the active living discourse promoted by international and national health

agencies as well as the Brazilian government. When they were asked about what people should do to be healthy, the vast majority of participant women answered that it is necessary to exercise, thus their discourse minimized the social and economic issues experienced by the community and themselves that might have much more influence on being healthy than LTPA per se.

Now regarding to the impacts of the 2016 Olympic Games on the sport/LTPA participation of the Cidade de Deus community, the perception of the women ranged from no change at all to some modest refurbishment of sport/LTPA facilities and availability of new sport/LTPA projects/programs within the community. The statements of these women challenge the claims of trickle-down effects and their consequent sport participation legacy for the whole population, since their experience reveals how difficult is for low income residents to engage in sport and LTPA even after Rio de Janeiro had been the host of many large scale sport events in the last ten years.

Furthermore, even those respondents who have perceived some infrastructural improvements in sport facilities and/or more opportunities of sport/LTPA projects within the Cidade de Deus community, were also worried about the continuity of such ameliorants after the end of the Games, since discontinuity and instability in the sport programs/projects is a symptomatic problem in Brazil and an expected outcome of any intervention that is publicly funded [24, 29].

Finally, it is important to highlight that despite the perceptions of some participants that the Olympic Games could motivate participation in sport and LTPA, they also emphasized that long-term participation in sport and LTPA needs to be supported by the availability of appropriate infrastructure and projects/programs inside their community, again challenging the “trickle-down” effect discourse, which claims that hosting sport mega events and showcasing the success of elite athletes are important strategies to increase sport participation among the general population [30, 31].

Discussion

To assess the impacts of the 2016 Olympic Games on the sport/PA participation and health of a low SES community's residents of Rio de Janeiro city, this study adopted a social ecological approach. This theoretical framework was chosen because of its holistic approach to explain human behaviour. Importantly, the social ecological theory surpasses the

understanding of human behaviour as a simple individual choice, and claims that human behaviour is also influenced by a range of issues, such as, the socioeconomic, cultural, political and environmental (32-35). In this study social ecological theory was an important approach that enabled the researcher to investigate non-personal evidence, for instance, the sport/LTPA political and environmental contexts available in the Cidade de Deus community, in a period of huge public investments to host sport mega-events in the city of Rio de Janeiro as well as in Brazil [36, 37], that might contribute to the sport/LTPA behaviour of women living in this community and their perspectives regarding the impacts of the 2016 Olympic Games on sport/LTPA participation and health .

Taking into consideration that bidding for and hosting the 2016 Olympic Games in Rio de Janeiro were actions promoted and supported by different levels of the Brazilian governments [38], it is possible to assume that such actions have the power to affect positively or negatively the national sport policies as well as sport infrastructures available for the Brazilian population. In order to understand to what extent the political decision of hosting the 2016 Olympic Games impacted on sport policies and sport infrastructure available for low SES communities residents, this study focused on the sport/LTPA programs/projects and accessed the sport/LTPA infrastructure available in the Cidade de Deus neighbourhood. Following the social ecological approach, studies 1 and 2 of this thesis were the initial steps towards the understanding of the sport/LTPA behaviours of Cidade de Deus residents' and their perceptions concerning the impacts of the 2016 Olympic Games on their and their community sport/PA participation and health.

Furthermore, according to the social ecological theory, investigating the impact of hosting the 2016 Olympic Games on sport/PA political and environmental contexts is essential to disclose the characteristics of the different systems (i.e. macro, exo and microsystem), where the host residents are embedded; to demonstrate how these systems are connected to each other; and to show how the characteristics of and interaction between these systems might play an important role on individuals' sport/LTPA behaviour and perceptions.

To gain a broader picture of the sport/LTPA political and environmental contexts, this study was based on the mixed-methods approach, for instance, study 1 was a qualitative inquiry and used a case study method (i.e. personal experiences, observations and secondary data) to analyse the sport/LTPA programs available in Cidade de Deus, while

study 2 was a quantitative inquiry and used a check-list (direct-observational) instrument to assess the quality of public PARs available in this neighbourhood. The mixed-methods design used for these two studies was the sequential exploratory design; the qualitative method was collected and analysed first and the quantitative data was used to expand the qualitative information [39, 40, 41].

The results of study 1 showed that the sport/LTPA projects/programs supported or implemented by the federal government were inefficient in providing opportunities for a sustainable sport/LTPA participation in the Cidade de Deus community; their main characteristic being a short-term duration that could not be considered a durable sport legacy of the 2016 Olympic Games.

Importantly, two of the three sport/LTPA programs (i.e. Segundo Tempo & PELC/PRONASCI) evaluated in this study had finished in Cidade de Deus before the beginning of the 2016 Olympic Games. The Segundo Tempo program terminated its activities in 2011 and the PELC/PRONASCI in 2012. Noteworthy, the Segundo Tempo program was described, in the candidature file for Rio de Janeiro to host the 2016 Olympic and Paralympic Games, as one of the sport legacies of the Games and the government commitments were to increase its capacity from 1 million to 3 million of participants by the year 2016 across the whole country[42]. However, two studies which have recently analysed the Segundo Tempo program have showed some evidences that the government promises concerning the growth of Segundo Tempo program have not been so successful, at least for those people living in vulnerable situation. For instance, the studies demonstrated that the Segundo Tempo program have been inefficient in reaching populations who live in municipalities where social vulnerability is high (i.e. small towns of up to 20,000 inhabitants with low tax collection, or municipalities where the social development index is very low or low) [43, 44]. Furthermore, the study of Moraes et al. (2017) revealed that most of the locations which have provided the Segundo Tempo program in Central-West region of Brazil were in operation for a maximal period of 24 months and none locations worked for more than 75 months [44]. Additionally, these two terminated sport/PA programs had children as its target group, and therefore, did not attend the needs of other population groups living in Cidade de Deus.

The third evaluated sport/LTPA project was the Academia na Praça (Fitness Studio in Square). This is a LTPA project financially supported by a private bank through the *Lei de*

Incentivo ao Esporte (Incentives for Sport Law), which allows private enterprises to direct one per cent of their taxes to sport/LTPA projects approved by the government and, in return, have their brand associated with these projects; it is delivered by a non-governmental organization. The Academia na Praça project provides LTPA for individuals from 15 years and above and it consists of an uncovered public fitness studio located in the main square of the Cidade de Deus community and besides one of its main streets. Thus, the LTPA practitioners are exposed to air pollutions, have no privacy to exercise and are not able to use the fitness studio in rainy or very hot days. However, these were not the only problems of this project, its “sub-contractual” characteristics, that is, the dependence upon the financial support of a private bank and its delivery by a non-governmental organization, transferring the government's constitutional responsibilities to the non-governmental sectors increased the problem of discontinuity, since in this kind of partnerships no long-term commitment is required.

After analysing the three sport/LTPA and projects/programs (i.e. Segundo Tempo, PELC/PRONASCI and Academia na Praça) developed by and/or implemented with the support of the Brazilian federal government, that was in operation or had been recently terminated its activities in Cidade de Deus, study 2 evaluated the quality of all public PARs existent in this community, for instance, those sport/LTPA facilities that are financially supported and managed by municipal government. The results of this study showed that the quality of Cidade de Deus PARs is very low with QIs ranging from -8 to 18 points while the possible minimum and maximal values for QI were -36 and 75. Importantly, most of these PARs had low scores in features and amenities and high scores in incivilities, and therefore, were not likely to be attractive sport/LTPA facilities for Cidade de Deus residents to practice sport and LTPA, since incivilities in public PARs have been often reported as an important barrier for sport/LTPA participation [45 - 47].

Significantly, another study conducted in Rio de Janeiro which used the PARA instrument to assess 38 public PARs located in different neighbourhoods across the city, shows that public PARs located in neighbourhoods with low social development index (SDI), (as it is also the case of Cidade de Deus community i.e. ranking 135th in the SDI among 158 neighbourhoods), were more likely to have lower quality of PARs [48]. Therefore, study 2 of this thesis and the study of Vieira and colleagues (2013) [48] reinforce the argument that the built environment conducive to LTPA engagement is not equally distributed across society,

either by being less available in low SES and minorities neighbourhoods or because of its low quality in such communities [49-54]. Furthermore, the results of study 2 challenge the government discourses which claim that an increase in sport/LTPA participation is a key benefit for hosting sport mega events in Brazil [42, 55].

Deploying social ecological theory, the results of study 1 and 2 demonstrate that the exosystem (sport/LTPA policies) as well as the microsystem (sport/LTPA infrastructure) available for Cidade de Deus residents are not conducive to sport/LTPA participation. Moreover, the results of these studies provide some evidences of the lack of commitment of the Brazilian politicians to provide opportunities for low SES residents to engage sustainably in sport/LTPA and to improve their health through sport/LTPA participation. Interestingly, the recent focus of health promotion policies supported by the federal government is to increase LTPA participation as an important strategy to improve the health of the Brazilian population and to tackle the high rates of non-communicable diseases (NCDs) in the country [56, 57]. However, according to the results of the studies 1 and 2, low SES community residents seem not to be a priority of the current national health promotion policies.

Additionally, according to Malta et al. (2011, 2012), the increasing investment of the federal government in LTPA participation is part of a ten year strategic plan for coping with NCDs. It was launched in 2011 and involves different Ministries and levels of governments, has school age children as well as the general population as target groups, and significantly, this plan was reported by the government as one of the legacies of hosting sport mega-events in Brazil [57, 58].

However, the results of the studies 1 and 2, or in other words, the analysis of the exo and microsystems existing in Cidade de Deus, showed that this community has not sustainably profited from this 10 year strategic plan and, therefore, three years before the 2016 Olympic Games take place in Rio de Janeiro, they had not experienced the sport/LTPA legacies of the Olympic Games and other major sport events hosted in Rio de Janeiro.

As the results showed some policies strategies or sport/LTPA projects/programs have been implemented/supported by the federal government (i.e. Segundo Tempo, PELC/PRONASCI and Academia na Praça programs/projects) in Cidade de Deus community, but they were not long enough to be considered an Olympic legacy or they do not have any guarantee of a long-term existence to provide sustainable sport/LTPA participation. Regarding the agreement between different levels of government to promote sport/LTPA

participation in general population as part of the ten year strategic plan for coping with NCDs [57, 58], the quality of public PARs available in Cidade de Deus provide an additional evidence, since the management of these sport/LTPA facilities were under the responsibility of the local government, that promoting sport/LTPA participation in low SES communities may not be a priority in governmental agendas.

Interestingly, even the annual national health survey reported that individuals with low SES profile are less likely to engage in LTPA than those with high SES profile and, therefore, being more exposed to this risk factor for the NCDs [59], the public investment in long-term sport/LTPA projects/programs and local sport/LTPA infrastructure in low SES communities like Cidade de Deus seems not to be at the fore front of the ten year strategic plan.

Importantly, the use of mixed-methods in the study 1 and 2 was of great value. The qualitative study, based on the case study method, provided an overview of the political scene in Brazil regarding sport/LTPA policies and the impacts of the current sport/LTPA policies strategies on the Cidade de Deus community. Specifically, study 1 focused on understanding how the federal government have delivered sport/LTPA projects/programs for Cidade de Deus residents, and examined in-depth the exosystem where this population is embedded. The results demonstrated clearly that the federal government is not fully committed to providing a sustainable sport/LTPA projects/program for the residents of this community. Additionally, the quantitative method explored the microsystem (sport/LTPA facilities) of Cidade de Deus and extends the results of the qualitative study since it evaluated the quality of the public PARs available in this community that is managed by the local government. For instance, study 2 revealed that the municipal government, responsible for the maintenance of the 29 public PARs assessed in Cidade de Deus community, have not prioritized investment in those PARs as an important strategy for a sustainable engagement in sport/LTPA in this community. Both studies corroborate that, in the era of many sport mega events being hosted in Brazil and Rio de Janeiro, sustainable public investments to increase sport/LTPA participation through the availability of long-term sport/LTPA projects/programs and high quality of PARs in low SES communities seems not to be the priority among the different levels of governments.

Studies 3 and 4 were more focused on assessing the most intrinsic part of the socio ecological model proposed in this thesis and, therefore, aimed to investigate the sport/LTPA

behaviours and perceptions of the Cidade de Deus residents. To discuss the possible impacts of the macro, exo and microsystems, where the research participants were embedded, on their sport/LTPA behaviours and perceptions concerning the influences of the 2016 Olympic Games on their and their community sport/LTPA participation and health, study 3 was based on quantitative methods and used the International Physical Activity Questionnaire (IPAQ) to disclose the PA patterns of women living in Cidade de Deus. Study 4 used a qualitative approach and conducted interviews with the resident women of this community. Thus, these two studies were also based on the mixed-methods approach. However the mixed-methods design approach differed from the two initial studies. The mixed-method design of studies 3 and 4 was sequential explanatory which means that the quantitative data was collected and analysed first and the qualitative data was collected later to expand the quantitative data.

Importantly, the results of the study 3 showed that the majority of the research participants (54.8%; n=78) reported high levels of PA and 87.4% (n=118) of them reported sufficient levels of PA for health improvements, according to public health recommendations [60], when all domains (i.e. household, occupational, TRPA and LTPA) were taken into consideration. However, when the focus of the analysis turned its attention to the LTPA domain, the results indicated that the researcher participants engaged very little in LTPA with 74.1% (n = 100) of participating women spending no energy in this PA domain, and only 25 individuals (18.5%) achieved the minimum levels of LTPA for health benefits. Another interesting result of study 3 was the analysis of the PA patterns of the research participants when the focus was the TRPA. In the TRPA domain, they were relatively more active than in LTPA, but more than half of participant women (57%; n = 77) spent less than 600 MET-minutes/week in TRPA, and therefore, were insufficiently active for health improvements. In addition, when the analysis combined TRPA and LTPA domains it was possible to observe the influence of TRPA to the levels of PA, and therefore, the percentage of participants that reported insufficient levels of PA dropped from 88.1% (n =119; LTPA alone) to 43.7% (n = 59; LTPA and TRPA combined).

Considering that the LTPA and TRPA domains are the most accurate domains assessed by the IPAQ, to explain PA patterns in the Brazilian population [61], that they are more likely to be affected by the hosting of sport mega events, as part of a variety of infrastructural changes/investments, and they can be directed impacted by sport/LTPA policies, they were the focus of this discussion.

Importantly, according to the results of studies 1 and 2 and the social ecological approach, the pattern of sport/LTPA behaviour of these women can be partly explained by the characteristics of the macro, exo and microsystems where they are embedded. For instance, studies 1 and 2 demonstrated that there is a lack of governmental long-term investments/commitments in sport/LTPA projects/programs as well as in sport/LTPA infrastructure in this community. Significantly, researchers worldwide have constantly shown that public sport/LTPA projects/programs, availability of sport/LTPA facilities and the characteristics of the built environment (i.e. presence of sidewalk or cycle paths) in the neighbourhood of residence play important roles in the LTPA and TRPA patterns of the local population [45, 62, 63]. Therefore, the LTPA and TRPA patterns of women residents in Cidade de Deus seems to be compatible with the results of these studies and also provide evidence for Bronfenbrenner's assumptions concerning human development/behaviour. The author argues that individual(s) development/behaviour is influenced by the different systems (i.e. macro, exo and micro), or in other words, by the characteristics of these systems, as well as, by the interaction of the individual(s) with these systems [64, 65]. Thus, the low levels of LTPA and also TRPA of women from Cidade de Deus show that the government needs to invest more in the micro and exosystem in order to help this community and, probably, other low SES communities in Rio de Janeiro/Brazil, to engage regularly in sport/LTPA as well as to stimulate them to be more active in transport-related activities.

Specifically, the results of study 3 refuted the discourses of the Olympic Games' stakeholders who have claimed that investments in sport mega events contribute to increasing sport/LTPA participation [42, 66, 67], showing that the vast majority of the research participants, four years after Rio de Janeiro being granted to host the 2016 Olympic Games, did not engage at all in LTPA. The results of study 3 reinforce the findings of other studies which have reported that to leverage sport/LTPA participation in the general population of sport mega events host cities it is necessary to promote/support other strategies alongside the host of these events. For instance, these studies have suggested that the development of sport/LTPA policies, the increasing of availability of grass root programs, and the better interaction between sport mega events' organizers and local sport organizations are good strategies to leverage sport/LTPA participation [68-70]. In the case of Cidade de Deus community, such strategies (i.e. investments in its exosystem or sport/LTPA

policies and its microsystem or sport/LTPA infrastructures) seem to not be well-implemented or not implemented at all, as was shown by the findings of the studies 1 and 2 and consolidated by the results of the study 3 which demonstrated that the LTPA levels of the research participants were extremely low.

To better understand the personal reasons for these low levels of LTPA in women from Cidade de Deus, study 4 of this thesis focused on interviewing some women of this community. This qualitative inquiry was indeed an important step in this research, not only because of its possibility in expanding the understanding of the quantitative data (IPAQ survey) produced in study 3, as it was the intention for using the sequential explanatory mixed methods design, but also because of its potential to show how the residents perceive the impacts of sport mega-events on sport/LTPA policies and infrastructure available in Cidade de Deus community.

Regarding the expansion of study 3, study 4 found that despite the majority of women from Cidades de Deus not being engaged regularly in sport/LTPA, they recognize sport/LTPA participation as a key strategy to facilitate health improvements. This result showed how these women have been strongly impacted by the active living discourse, embedded in the sport/LTPA and health legacies discourses, as a vector for a healthy life. Interestingly, despite the women acknowledging that the public health system available in their community, specifically, and in the city/country, in general, is very chaotic, the vast majority of the participants said that to be a healthy people it is necessary to exercise or be regularly engaged in LTPA.

In addition, women from Cidade de Deus also expressed their bad feelings for not participating regularly in sport/LTPA. This result demonstrated that the Brazilian government have succeeded in shaping the health/active living narratives of Cidade de Deus women and, consequently, have transferred the responsibility of being physical active and healthy to personal choices, disregarding the variety of cultural or socioeconomic issues that have been shown to have great influence on sedentary behaviour [71,72]. Therefore, the sport/LTPA and health legacies discourses contributed subtly to minimize the government accountability in providing a good health system and sustainable sport/LTPA policies. Moreover, the sport/LTPA and health legacies discourses has the power to reduce the importance of other health discourses of Cidade de Deus community, which are based on different socio-

economic problems experienced by its residents that might have much more influence on their health than low levels of LTPA.

Significantly, the sport/LTPA and health legacies discourses of the 2016 Olympic Games have been supported by different health institutions which have often promoted LTPA participation as an important strategy for health improvements of the general population [56] and, therefore, these institutions have contributed to the empowerment of the sport/LTPA and health legacies discourses. Importantly, the findings of study 4 corroborate the argument of Azzarito and Solomon (2005) who claim that dominant discourses are produced by the relationship between knowledge, power, truth and political-social interests [73]. For instance, in Brazil, health promotion campaigns have used the results of epidemiological studies (i.e. the national surveillance of the risk and protective factors for NCDs) to highlight the low levels of LTPA in the women population, then these campaigns emphasize that women health improvements could be easily achieved through 30 minutes of exercise a day without any further consideration of women daily duties [74], as well as, the influences of their SES profile on regular participation in LTPA.

The other two important findings of study 4 were: The impacts of the 2016 Olympic Games on opportunities to practice sport/PA in Cidade de Deus community and the meaning of the 2016 Olympic Games for women from Cidade de Deus. Interestingly, the perceptions of these women concerning the impacts of the Games on sport/LTPA facilities and projects/programs available in their community, three years before the 2016 Olympic Games took place in the city, range from no change at all to small improvements. Additionally, they asserted that sport/LTPA policies or infrastructures to provide the community a sustainable sport/LTPA participation need to have long-term focus and commitments, and their arguments challenge the “trickle-down” effect discourse which supports the idea that successful performance by elite athletes will benefit the general population of host cities through increasing interest in sport/LTPA, and therefore, participation [75, 76]. However, according to the research participants, to engage regularly in sport and LTPA and improve their health through sustainable sport/LTPA participation, the host residents, at least those living in low SES communities, need much more than elite athlete inspirations, they need political commitments and financial support.

Regarding the meanings of the 2016 Olympic Games for women from Cidade de Deus, study 4 showed that despite being the Summer Olympic Games the biggest multi-sport

event concerning number of participants, media coverage, sport infrastructure and sponsors involved [77], the majority of these women have no idea of what the Games are in practice. Most of them have confounded it with the 2014 FIFA World Cup or declared not be interested in any sport event at all, because all of them are related to the misuse of public money and political corruption. Significantly, despite the dissatisfaction of Cidade de Deus residents, and probably other low SES residents, with scarce public resources being directed to hosting sport mega events instead of being spent in more urgent problems, such as improvements in health and educational systems, the Brazilian government have, in the last ten years, financially supported five sport mega events in Rio de Janeiro.

Importantly, the intention of using the interview in the last phase of this study was to give voice to the residents of Cidade de Deus community. It was an opportunity to discuss the research problems of studies 1 and 2, including the impacts of the 2016 Olympic Games on sport/LTPA policies and the infrastructure existent in this neighbourhood, from the point of views of its residents. Furthermore, the interviews were also significant in providing personal information to understand the relevance of LTPA to the lives of Cidade de Deus women given that their engagement in LTPA was very low, as was revealed by study 3.

Thus, the findings of study 4 contributed to corroborating the findings of studies 1 and 2, which showed that there is a lack of governmental support to leverage sport/LTPA participation by individuals living in low SES communities of Rio de Janeiro, as well as, provide extra explanations about the meaning of the LTPA in the life of the participant women. This study demonstrates through the lens of women residents in Cidade de Deus, how the contexts of the macro, exo and micro system where they are embedded have impacted on their sport/LTPA participation, and consequently, sport/LTPA behaviour. In addition, study 4 contributed to fulfil one of the purposes for conducting mixed methods, that is, to communicate the needs of individuals who are marginalized or underrepresented [78], as it is the case of low SES individuals living in developing countries.

Overall Conclusion

The main objective of this thesis was to assess the impacts of the Rio 2016 Olympic Games on sport/LTPA participation and, consequently, on the health of individuals living in Rio de Janeiro city. Specifically, this thesis focused on women living in the low SES community of Cidade de Deus. To achieve the study aim, four empirical studies in a mixed

methods design were developed. Case study, observational assessment, questionnaire and interviews were the methodological approaches used to produce data. Importantly, all these studies were based on the use of social ecological theory. Therefore, the sport/LTPA policies (exosystem) and infrastructure (microsystem) available in the Cidade de Deus neighbourhood were analysed as initial points to discuss the sport/LTPA behaviour of women living in this community followed by the study of their perceptions concerning the impacts of the 2016 Olympic Games on their and their community's sport/LTPA participation and health.

The social ecological theory used in this thesis was very important to show that human behaviour is indeed influenced by different contexts, such as, economic, cultural, political, geographic and environmental where the individuals are embedded. The strength of this methodological approach was to enable the researcher to analyze the objective (government policy/practice) conditions and subjective responses within the community or, in other words, to examine the macro framework that inter-acts with the micro level. Thus, the social ecological approach facilitates a more holistic analysis.

Regarding the different systems analyzed in this thesis, the findings of studies 1 and 2 revealed that the sport/LTPA policies (exosystem) and infrastructure (microsystem) available in Cidade de Deus were not conducive to sport/LTPA practices of the community residents. According to the studies' findings the community lack of sustainable governmental commitments for increasing sport/LTPA participation. For example, the governmental negligence regarding improving sport/LTPA participation was observed in the instability/discontinuity of the sport/LTPA projects/programs available in this community, in the transference of governmental responsibilities to providing sport/LTPA projects/programs to non-governmental sectors, and in the low quality of the sport/LTPA facilities available there.

Importantly, when the focus of this thesis turned to the individual level and therefore, assessed the women's PA behaviour and their perceptions about the impacts of the 2016 Olympic Games on their sport/LTPA participation and health, the research findings have confirmed that their PA behaviour and perceptions have indeed been influenced by the macro, exo and micro-systems that they are part of. For instance, the low levels of LTPA participation of women from Cidade de Deus provide evidence that the problems experienced by the community to have access to assured long-term sport/LTPA

projects/programs as well as good quality of sport/LTPA facilities, found in studies 1 and 2, have played an important role in shaping their LTPA participation. This evidence was also confirmed by interviews with women from Cidade de Deus. According to their narratives LTPA is considered an important component for health improvements. However, they asserted that the community lacked appropriate sport/LTPA places as well as projects/programs.

Furthermore, study 4 contributed to a better understanding the impacts of the macrosystem (i.e. the health and sport/LTPA legacies discourses/commitments of the 2016 Olympic Games) on the exo and microsystems available in Cidade de Deus as well as on the life of women living in this community. Significantly, the Brazilian government and other stakeholders of the 2016 Olympic Games have claimed that hosting the Games in Rio de Janeiro would contribute to motivate the population to be more engaged in sport/LTPA and would also increase the government investments in sport/LTPA for the general population, and mainly for those living in disadvantaged areas [42]. However, all studies conducted in this research project have proved otherwise. For example, study 1 showed that sport/LTPA projects/programs have not received enough support from the federal government; study 2 demonstrated that the local government have neglected the maintenance of sport/LTPA facilities in this community and, therefore, most of this facilities presented low quality; study 3 revealed that despite living in an Olympic city, the vast majority of women from Cidade de Deus do not engage at all in LTPA; and, finally, study 4 showed that the activating living discourse, which assumes that health improvements through sport/LTPA participation is an individual choice to be or not be healthy, and it is embedded in the sport/LTPA and health legacies discourses of the 2016 Olympic Games, have shaped the narratives of the research participants concerning the meanings of health and sport/LTPA. However, even being influenced by the active living discourse or the sport/LTPA and health legacies discourses of the 2016 Olympic Games, the women from Cidade de Deus have easily recognized the variety of problems faced by their community to be healthy as well as to engage sustainably in sport and LTPA.

Concerning the mixed methods approach used in this thesis, the results of the four empirical studies provided evidence of the benefits of this methodological approach to studies conducted in the sports science field. First, the mix methods approach contributed to producing a wider framing of the research problem (i.e. the impacts of the 2016 Olympic

Games on sport/LTPA and health of women from Cidade de Deus), and in the first phase of this thesis it was used to reveal broadly the governmental investments in sport/LTPA in Cidade de Deus community. For instance, the qualitative method focused on evaluating the sport/LTPA projects/programs and the quantitative on assessing the sport/LTPA facilities. In the second phase of this thesis, the quantitative approach was used to measure the PA patterns of women from Cidade de Deus and the qualitative provided information on their perceptions concerning the impacts of the 2016 Olympic Games on the sport/LTPA participation and health. Thus, deploying the mixed methods approach was important to discussing in depth the research problem and, consequently, to better understand it. Furthermore, the use of qualitative and quantitative methods, in both phases of this research project, contributed to produce subjective and objective data which enriched the understanding of the research problem once they were assessed from multiple points of view and perspectives.

Perspectives

This study was an initial step to understand how the governments of developing countries, which host sport mega events, have delivered opportunities to low SES communities' residents to engage in sport/LTPA. For instance, this research focused on assessing the impacts of the 2016 Olympic Games on the sport/LTPA participation of women resident in a low SES community in Rio de Janeiro city and it was based on social ecological theory and used mixed methods design. Specifically, this study looked at the sport/LTPA programs and facilities available in Cidade de Deus community as well as the PA patterns of its residents and their perceptions of the impact of sport mega events on their lives.

The study findings demonstrated that the use of the social ecological theory to investigate the sport/LTPA behaviour of low SES individuals is indeed of great value. Significantly, in this study, the social ecological theory contributed to reveal how some external (i.e. macro, exo, meso and micro-systems) influences played an important role on the sport/LTPA participation of low SES residents. For instance, the macro, exo and micro-systems examined in this study provided significant information about the political and environmental context of Cidade de Deus residents which might be more significant to explain their sport/LTPA behaviour than intrinsic factors.

Future research exploring how other external factors, such as, media and educational and cultural issues impact on the sport/LTPA behaviour of low SES residents would be very important to provide a broader picture of the external factors that most constrain low SES residents to engage regularly in sport/LTPA. A larger knowledge of the external issues that are impairments for low SES residents, who live in cities that host sport mega events, to participate in sport/LTPA may contribute to government better planning sport/LTPA policies before, during and after hosting the event as well as its sport/LTPA legacies.

Research focusing on the impacts of sport mega events on low SES residents' personal motivations to engage in sport/LTPA may provide additional and important information that can contribute to governments developing and delivering more appropriate sport/LTPA projects/programs as well as sport/LTPA infrastructure for this population group.

Increasing the use of mixed methods approach in research related to the impacts of sport mega events on sport/LTPA participation of local residents may be an interesting strategy to gain an in-depth knowledge of the positive and negative issues that can contribute to or prevent host city residents to benefit from sport/LTPA legacies, mainly those living in marginalized communities. Importantly, researchers as well as policy makers can take advantage of using the mixed methods approach, instead of mono-method research, because this approach enables them to benefit from the strengths of both qualitative and quantitative methods, for instance, the generalizability of the quantitative methods and the contextual nature of the qualitative [79, 80].

For the Olympic movement a continued evaluation of the impacts of the Olympic Games on sport/LTPA participation of the host cities/countries residents is an important value. First, because one of the missions of the Olympic Games, described in the Olympic charter, is the development of sport for all [81]. Thus, understanding how different countries have planned, delivered and managed strategies to increase sport/LTPA participation in their population, in the lead up to hosting the Olympic Games, can contribute to create better definitions of what are sport/LTPA legacies and what kind of sport/LTPA legacies should be expected by the host population and delivered by Games' organizers. Furthermore, the frequent assessment of sport/LTPA legacies can provide information of the positive and negative experiences in planning and managing sport/LTPA legacies of the Olympic Games, and it may help candidate cities to better organize their sport/LTPA legacies strategies and, consequently, to increase its chance to deliver positive sport/LTPA legacies for the whole

society, and mainly for those who the needs are great, such as, the low SES community residents.

Finally, a follow-up study is intended and it would focus on how Cidade de Deus residents as well as other low SES community residents may have benefited from the hosting of the 2016 Olympic Games in the post games period. For instance, whether they have had opportunities to make use of the sport venues built for the Games, whether other infrastructure built for the Games have impacted their sport/LTPA behaviours, whether governments have increased investments in sport/LTPA projects/programs and infrastructures available in low SES communities and whether the provisions of sport/LTPA projects/programs have targeted different population groups, such as, women, disabled, and elderly. The intention of a future research is to get a broader picture of how the 2016 Olympic Games, after its ending or in the legacy phase, have impacted or not on the sport/LTPA participation of different population groups living in low SES communities of Rio de Janeiro and, therefore, provide information that can contribute to think about new strategies for leveraging the sport/LTPA legacies of sport mega events, mainly for those who are in most need.

Furthermore, a research focused on the dominant health and LTPA discourses of Brazilian society should be pursued in the follow up study in order to better understand the power of some institutions in shaping and disseminate dominant discourses in this country. For instance, research should lay emphasis on how health and LTPA discourses have been shaped, supported and propagated by the Brazilian media and national health campaigns and surveillances. Such investigation could provide additional information about the power of the dominant health and LTPA discourses, for instance, those discourses that have maximized the individual responsibility for their own health situation and minimized the government accountability in providing and implementing sustainable health and LTPA policies, mainly in a period of large public investments being directed to host sport mega events.

The narratives of women from Cidade de Deus have briefly showed that the Brazilian government has succeeded in transferring to the individual its responsibility in providing effective health system, long-term sport/LTPA projects/programs and good quality of sport/LTPA facilities, and therefore, it has promoted, through different strategies, that being healthy is a personal choice and it is related to individual behaviour and life-style [74].

However, the studies' findings of this thesis have shown that the lack of sport/LTPA programs/projects and good quality of sport/LTPA infrastructures inside the Cidade de Deus community were significant constraints to the sport/LTPA participation of Cidade de Deus residents. Even this external problems being also recognized by Cidade de Deus women as important impediments to engage regularly in sport and LTPA, they have declared being guilty for not participating in sport and LTPA. Thus, understanding how the dominant discourses of health and LTPA have been imposed on Brazilian society and mainly on those living in low SES community, where the lack of government support for health improvements and sport/LTPA participation is clearly experienced, it would be of great value to discuss new strategies to find ways to highlight and value other health and sport/LTPA discourses.

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APPENDIX

Appendix A – Physical Activity Resource Assessment Instrument (PARA)

1) Date _____ 4) Time start: _____ stop: _____	2) Data col _____ 5) Phone Call departure: _____ arrival: _____	3) HD/PA Resource ID _____	
6) Type of Resource 1 fitness club 2 park 3 sport facility 4 trail 5 community center 6 church 7 school 8 combination _____		7) Approximate Size: 1 sm 2 med 3 lg 8) Capacity (indoor) _____ 9) Cost 1 Free 2 Pay at the door 3 Pay for only certain programs 4 Other _____	
10) Hours a) open _____ b) close _____		11) Signage – Hours yes <input type="checkbox"/> no <input type="checkbox"/>	
12) Signage – Rules yes <input type="checkbox"/> no <input type="checkbox"/>			
Feature	Rating	Amenity	Rating
13) Baseball field	0 1 2 3	26) Access Points	0 1 2 3
14) Basketball courts	0 1 2 3	27) Bathrooms	0 1 2 3
15) Soccer field	0 1 2 3	28) Benches	0 1 2 3
16) Bike Rack	0 1 2 3	29) Drinking fountain	0 1 2 3
17) Exercise Stations	0 1 2 3	30) Fountains	0 1 2 3
18) Play equipment	0 1 2 3	31) Landscaping efforts	0 1 2 3
19) Pool > 3 ft deep	0 1 2 3	32) Lighting	0 1 2 3
20) Sandbox	0 1 2 3	33) Picnic tables shaded	0 1 2 3
21) Sidewalk	0 1 2 3	34) Picnic tables no-shade	0 1 2 3
22) Tennis courts	0 1 2 3	35) Shelters	0 1 2 3
23) Trails – running/biking	0 1 2 3	36) Shower/Locker room	0 1 2 3
24) VB courts	0 1 2 3	37) Trash containers	0 1 2 3
25) Wading Pool < 3 ft.	0 1 2 3		
Incivilities	Rating	Incivilities	Rating
38) Auditory annoyance	0 1 2 3	44) Graffiti/tagging	0 1 2 3
39) Broken glass	0 1 2 3	45) Litter	0 1 2 3
40) Dog refuse	0 1 2 3	46) No grass	0 1 2 3
41) Dogs Unattended	0 1 2 3	47) Overgrown grass	0 1 2 3
42) Evidence of alcohol use	0 1 2 3	48) Sex paraphernalia	0 1 2 3
43) Evidence of substance use	0 1 2 3	49) Vandalism	0 1 2 3
Comments: 			

Appendix B – International Physical Activity Questionnaire**INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE**

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** and **moderate** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal.

PART 1: JOB-RELATED PHYSICAL ACTIVITY

The first section is about your work. This includes paid jobs, farming, volunteer work, course work, and any other unpaid work that you did outside your home. Do not include unpaid work you might do around your home, like housework, yard work, general maintenance, and caring for your family. These are asked in Part 3.

1. Do you currently have a job or do any unpaid work outside your home?

Yes

No



Skip to PART 2: TRANSPORTATION

The next questions are about all the physical activity you did in the **last 7 days** as part of your paid or unpaid work. This does not include traveling to and from work.

2. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, heavy construction, or climbing up stairs **as part of your work**? Think about only those physical activities that you did for at least 10 minutes at a time.

_____ **days per week**

No vigorous job-related physical activity



Skip to question 4

3. How much time did you usually spend on one of those days doing **vigorous** physical activities as part of your work?

_____ **hours per day**

_____ **minutes per day**

4. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads **as part of your work**? Please do not include walking.

_____ **days per week**

No moderate job-related physical activity



Skip to question 6

5. How much time did you usually spend on one of those days doing **moderate** physical activities as part of your work?

_____ **hours per day**

_____ **minutes per day**

6. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time **as part of your work**? Please do not count any walking you did to travel to or from work.

_____ **days per week**

No job-related walking



Skip to PART 2: TRANSPORTATION

7. How much time did you usually spend on one of those days **walking** as part of your work?

_____ **hours per day**

_____ **minutes per day**

PART 2: TRANSPORTATION PHYSICAL ACTIVITY

These questions are about how you traveled from place to place, including to places like work, stores, movies, and so on.

8. During the **last 7 days**, on how many days did you **travel in a motor vehicle** like a train, bus, car, or tram?

_____ **days per week**

No traveling in a motor vehicle



Skip to question 10

9. How much time did you usually spend on one of those days **traveling** in a train, bus, car, tram, or other kind of motor vehicle?

_____ **hours per day**

_____ **minutes per day**

Now think only about the **bicycling** and **walking** you might have done to travel to and from work, to do errands, or to go from place to place.

10. During the **last 7 days**, on how many days did you **bicycle** for at least 10 minutes at a time to go **from place to place**?

_____ **days per week**

No bicycling from place to place



Skip to question 12

11. How much time did you usually spend on one of those days to **bicycle** from place to place?

_____ hours per day

_____ minutes per day

12. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time to go **from place to place**?

_____ days per week

No walking from place to place



***Skip to PART 3: HOUSEWORK,
HOUSE MAINTENANCE, AND
CARING FOR FAMILY***

- 13. How much time did you usually spend on one of those days walking from place to place?**

_____ hours per day

_____ minutes per day

PART 3: HOUSEWORK, HOUSE MAINTENANCE, AND CARING FOR FAMILY

This section is about some of the physical activities you might have done in the **last 7 days** in and around your home, like housework, gardening, yard work, general maintenance work, and caring for your family.

14. Think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, chopping wood, shoveling snow, or digging **in the garden or yard**?

_____ days per week

No vigorous activity in garden or yard



Skip to question 16

15. How much time did you usually spend on one of those days doing **vigorous** physical activities in the garden or yard?

_____ **hours per day**

_____ **minutes per day**

16. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** activities like carrying light loads, sweeping, washing windows, and raking **in the garden or yard**?

_____ **days per week**

No moderate activity in garden or yard



Skip to question 18

17. How much time did you usually spend on one of those days doing **moderate** physical activities in the garden or yard?

_____ **hours per day**

_____ **minutes per day**

18. Once again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** activities like carrying light loads, washing windows, scrubbing floors and sweeping **inside your home**?

_____ **days per week**

No moderate activity inside home



***Skip to PART 4: RECREATION,
SPORT AND LEISURE-TIME
PHYSICAL ACTIVITY***

19. How much time did you usually spend on one of those days doing **moderate** physical activities inside your home?

_____ **hours per day**

_____ **minutes per day**

PART 4: RECREATION, SPORT, AND LEISURE-TIME PHYSICAL ACTIVITY

This section is about all the physical activities that you did in the **last 7 days** solely for recreation, sport, exercise or leisure. Please do not include any activities you have already mentioned.

20. Not counting any walking you have already mentioned, during the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time **in your leisure time**?
_____ **days per week**

No walking in leisure time

**Skip to question 22**

21. How much time did you usually spend on one of those days **walking** in your leisure time?
_____ **hours per day**
_____ **minutes per day**

22. Think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **vigorous** physical activities like aerobics, running, fast bicycling, or fast swimming **in your leisure time**?
_____ **days per week**

No vigorous activity in leisure time

**Skip to question 24**

23. How much time did you usually spend on one of those days doing **vigorous** physical activities in your leisure time?
_____ **hours per day**
_____ **minutes per day**

24. Again, think about only those physical activities that you did for at least 10 minutes at a time. During the **last 7 days**, on how many days did you do **moderate** physical

activities like bicycling at a regular pace, swimming at a regular pace, and doubles tennis **in your leisure time**?

_____ **days per week**

No moderate activity in leisure time → **Skip to PART 5: TIME SPENT SITTING**

25. How much time did you usually spend on one of those days doing **moderate** physical activities in your leisure time?

_____ **hours per day**

_____ **minutes per day**

PART 5: TIME SPENT SITTING

The last questions are about the time you spend sitting while at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television. Do not include any time spent sitting in a motor vehicle that you have already told me about.

26. During the **last 7 days**, how much time did you usually spend **sitting** on a **weekday**?

_____ **hours per day**

_____ **minutes per day**

27. During the **last 7 days**, how much time did you usually spend **sitting** on a **weekend day**?

_____ **hours per day**

_____ **minutes per day**

This is the end of the questionnaire, thank you for participating

Demographic Information for the IPAQ

1. Name:

-
2. Age:
 3. Education:
 4. Marital status (e.g. single, married, divorced):
 5. Occupation:
 6. Work Status (e.g. government employee, non-government employee, self-employed, non-paid, student, retired, unemployed, unable to work):
 7. Monthly Income:
 8. How many children do you have?
 9. How many people live in household and how many of them are older than 18 years, including you?
 10. How many people have a monthly income in your household?
 11. How long have you been living in the community of Cidade de Deus?

Health Information for the IPAQ

1. Have you ever had your blood pressure measured by a doctor or other health worker?
2. Have you ever been told by a doctor or other health worker that you have raised blood pressure or hypertension?
 - a. If yes, have you been told that in the past 12 months?
3. Have you ever had your blood sugar measured by a doctor or other health worker?
4. Have you ever been told by a doctor or other health worker that you have raised blood sugar or diabetes?
 - a. If yes, have you been told that in the past 12 months?
5. Height:
6. Weight:
7. Are you pregnant?

Appendix C – Guideline for Interviews

Themes	Questions
1. Meaning of Health	a. What does health mean for you? b. How much is health important? c. What must be done to be a healthy person?
2. Meaning of Physical Activity	d. What does physical activity means for you? e. How much is physical activity important? f. What must be done to be an active person?
3. Expectations of changes	g. What should be done to improve the health situation in your community/in Rio de Janeiro and who should do it? h. What should be done in your community/in Rio de Janeiro society to enhance the opportunity of practicing physical activity and who should do it?
4. Rio 2016 Olympic Games	i. What does the 2016 Olympic Games in Rio de Janeiro mean for you? j. Which improvements can the 2016 Olympic Games in Rio de Janeiro bring to the health of your community or Rio de Janeiro society? k. How the 2016 Olympic Games in Rio de Janeiro can influence on the practice of physical activity? l. Which improvements can the 2016 Olympic Games in Rio de Janeiro bring to you and your community concerning the opportunities to practice physical activity?

Appendix D – Ethics Approval



**HUMAN RESEARCH ETHICS COMMITTEE (HREC)
HUMAN RESEARCH ETHICS SUB-COMMITTEE (HRESC)**

NOTIFICATION

To: Dr Arianne Carvalhedo Reis
School of Tourism and Hospitality Management
arianne.reis@scu.edu.au

From: Secretary, Human Research Ethics Committee
Division of Research, R. Block

Date: 28 March 2012

Project: *Preparing for Rio de Janeiro 2016: How the Olympics can improve the health of women living in low-income communities.*

Approval Number: ECN-12-068

The Southern Cross University Human Research Ethics Committee has established, in accordance with the National Statement on Ethical Conduct in Human Research – Section 5/Processes of Research Governance and Ethical Review, a procedure for expedited review and ratification by a delegated authority of the HREC.

Your expedited application has been considered and approved by the HRESC, Coffs Harbour.

Your study may commence under HREC approval.

This approval is subject to the usual standard conditions of approval. Please see over.

Ms Sue Kelly

HREC Administration

Ph: (02) 6626 9139

E. ethics.lismore@scu.edu.au

Professor Bill Boyd

Chair, HREC

Ph: 02 6620 3569

E. william.boyd@scu.edu.au



HUMAN RESEARCH ETHICS COMMITTEE (HREC)

HUMAN RESEARCH ETHICS SUB-COMMITTEE (HRESC)

**STANDARD CONDITIONS OF APPROVAL FOR ALL ETHICALLY APPROVED
RESEARCH PROJECTS**

The following standard conditions of approval are mandatory for all research projects which have been approved by the HREC or a HRESC and have received an ethics approval number.

All reporting is to be submitted through the Human Research Ethics Office, either at Lismore, Coffs Harbour or Tweed/GC. Forms for annual reports, renewals, completions & changes of protocol are available at the website: http://www.scu.edu.au/research/index.php/dds/?cat_id=1225#cat1225

The email address is ethics.lismore@scu.edu.au ethics.coffsharbour@scu.edu.au ethics.tweed@scu.edu.au

Standard Conditions in accordance with the National Statement on Ethical Conduct in Human Research (National Statement) (NS).

1. Monitoring

NS 5.5.1 – 5.5.10

Responsibility for ensuring that research is reliably monitored lies with the institution under which the research is conducted. Mechanisms for monitoring can include:

- (a) reports from researchers;
- (b) reports from independent agencies (such as a data and safety monitoring board);
- (c) review of adverse event reports;
- (d) random inspections of research sites, data, or consent documentation; and
- (e) interviews with research participants or other forms of feedback from them.

2. Approvals

- (a) All ethics approvals are valid for **12 months** unless specified otherwise. If research is continuing after 12 months, then the ethics approval **MUST** be renewed. Complete the Annual Report/Renewal form and send to the ethics office.
- (b) *NS 5.5.5*
The researcher/s will **provide a report every 12 months** on the progress to date or outcome in the case of completed research including detail about:
Maintenance and security of the records.

Compliance with the approved proposal.

Compliance with any conditions of approval.

Changes of protocol to the research.

3. Reporting to the HREC

- (c) The researchers will immediately notify the ethics office, on the appropriate form, **any change in protocol**. *NS 5.5.3*
- (d) A **completion report**, on the appropriate form, must be forwarded to the ethics office.
- (e) The researchers will immediately notify the ethics office about any circumstance that might affect ethical acceptance of the research protocol. *NS 5.5.3*
- (f) The researchers will immediately notify the ethics office about any adverse events/incidences which have occurred to participants in their research. *NS 5.5.3*

2. Research conducted overseas

NS 4.8.1 – 4.8.21

Researchers conducting a study in a country other than Australia, need to be aware of any protocols for that country and ensure that they are followed ethically and with appropriate cultural sensitivity.

3. Participant Complaints

NS 5.6.1 – 5.6.7

General information

Institutions may receive complaints about researchers or the conduct of research, or about the conduct of a Human Research Ethics Committee (HREC) or other review body.

Complaints may be made by participants, researchers, staff of institutions, or others. All complaints should be handled promptly and sensitively. All participants in research conducted by Southern Cross University should be advised of the above procedure and be given a copy of the contact details for the Complaints Officer. They should also be aware of the ethics approval number issued by the Human Research Ethics Committee.

The following paragraph is to be included in any plain language statements for participants in research.

Complaints about the ethical conduct of this research should be addressed in writing to the following:

Ethics Complaints Officer

HREC

Southern Cross University

PO Box 157

Lismore, NSW, 2480

Email: ethics.lismore@scu.edu.au

All complaints are investigated fully and according to due process under the National Statement on Ethical Conduct in Human Research and this University. Any complaint you make will be treated in confidence and you will be informed of the outcome.

Appendix E – Information Sheet**INFORMATION SHEET**

Name of project: Preparing for Rio de Janeiro 2016: How the Olympics can improve the health of women living in low-income communities (previous name of this thesis)

Introduction

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you of any kind and we thank you for considering our request.

What is this research?

The aims of the research programme are to collect data about physical activity levels and rates in women living in low-income communities and also to conduct an investigation of the perceptions of Rio de Janeiro residents (women) of the sport participation and health legacies to be derived from hosting the 2016 Summer Olympic Games. We are particularly interested in the views of women from low-income communities with the Olympic message of active and healthy living through sport and physical activity participation.

What does this research involve?

i) Questionnaire

Should you agree to take part in this project, you will be asked to participate in a questionnaire survey that will consist of a meeting with the researcher to answer the International Physical Activity Questionnaire (IPAQ). If you take part in this study, you will be request to have an individual meeting with the researcher. The questionnaire will be administered as face-to-face interview and with the researchers' assistance. The

questionnaire will take approximately 40 minutes and will take place at one of the non-government organizations' offices or the school building that are located in your neighbourhood. We will endeavour to schedule the questionnaire to a date and time that is convenient to you. The researchers will ask questions regarding the time you spent doing physical activity in the last seven days.

It is our duty to anticipate and where possible, prevent any adverse or unfavourable experiences associated with this research. It is our duty to inform you of the research procedure and how the data will be used. Findings of this research will be collated as group data, with no identifying features.

In the event that the line of questioning does develop in such a way that you feel hesitant or uncomfortable you are reminded of your right to decline to answer any particular question(s) and also that you may withdraw from the project at any stage without any disadvantage to yourself of any kind.

The data collected will be securely stored in such a way that only the researchers will be able to gain access to it. At the end of the project any personal information will be destroyed immediately except that, as required by the University's research policy, any raw data on which the results of the project depend will be retained in secure storage for seven years, after which it will be destroyed.

Participants may request from the principal researcher at any time a copy of their recorded questionnaire or research results. Participants will also be advised how to access any publications that may arise from this research. No published material will identify individuals and all data will be presented as group data only.

Your participation in this research is purely voluntary, and you are free to withdraw from the study at any time. If you wish to leave the research, simply inform the researchers.

The results of this study may be published in a peer-reviewed journal and presented at conferences, but only group data will be reported.

ii) Interview

Should you agree to take part in this project, you will be asked to participate in an interview that will take approximately one hour. In this instance you will be required to express your opinion and ideas about how the preparations for the 2016 Olympic Games have been impacting, or you expect will impact, on your health and quality of life. We will endeavour to schedule the interview to a date and time that is convenient to you.

It is our duty to anticipate and where possible, prevent any adverse or unfavourable experiences associated with this research. It is our duty to inform you of the research procedure and how the data will be used. Findings of this research will be collated as group data, with no identifying features.

The interview involves an open-questioning technique where the precise nature of the questions which will be asked have not been determined in advance, but will depend on the way in which the interview develops. In the event that the line of questioning does develop in such a way that you feel hesitant or uncomfortable you are reminded of your right to decline to answer any particular question(s) and also that you may withdraw from the project at any stage without any disadvantage to yourself of any kind.

The data collected will be securely stored in such a way that only the researchers will be able to gain access to it. At the end of the project any personal information will be destroyed immediately except that, as required by the University's research policy, any raw data on which the results of the project depend will be retained in secure storage for seven years, after which it will be destroyed.

Participants may request from the principal researcher at any time a copy of their recorded interview, and interview transcript or research results. Participants will also be advised how to access any publications that may arise from this research. Any published material utilising quotes will not identify individuals and pseudonyms will be used with no details provided that may enable participants to be identified.

Your participation in this research is purely voluntary, and you are free to withdraw from the study at any time. If you wish to leave the research, simply inform the researchers.

The results of this study may be published in a peer-reviewed journal and presented at conferences, but only group data will be reported.

Participant's Consent

If you decide to participate, please read the attached consent form. If you agree to the terms presented there, you can indicate your consent by signing the form and bringing it with you to our meeting. Before commencement of the focus group, interview and questionnaire the consent form will be read to you again to ensure you are fully aware of the terms. Your agreement will be digitally recorded and stored, together with signed confirmation. You are free, however, to withdraw your consent and discontinue participation at any time.

Inquiries

If you have any further inquiries in regard to the present study, please do not hesitate to ask the principal researchers.

Arianne C. Reis

Email: arianne.reis@scu.edu.au

Fabiana Rodrigues de Sousa-Mast

Email: fabiana.rodrigues@unibas.ch

You can also contact our research assistant who lives in Rio de Janeiro:

Ana Flavia Paes Leme de Almeida

Lastly, the [institution's name] coordinator, [full name], will receive a copy of the results of the study and you can request a copy from them at any time:

[name]

[telephone]

Feedback

If you would like feedback from this study, a summary of the research will be posted to you at the completion of the study. If you would like to receive the results of this research, indicate this during your interview. You can also call or email any of the three contacts above to request a report with the research findings.

Has this research been approved by Southern Cross University?

This research has been approved by the Human Research Ethics Committee at Southern Cross University. The approval number is **ECN-12-068**.

Complaints about the research/researchers

If you have concerns about the **ethical conduct** of this research or the researchers, the following procedure should occur.

Write to the following:

The Ethics Complaints Officer

Southern Cross University

PO Box 157

Lismore NSW 2480

Email: ethics.lismore@scu.edu.au

All information is confidential and will be handled as soon as possible.

Appendix F – Consent Form

CONSENT FORM

Title of research project: Preparing for Rio de Janeiro 2016: How the Olympics can improve the health of women living in low-income communities

Name of researchers: Arianne C. Reis and Fabiana R. Sousa-Mast

(Contact details of the researcher are contained in the information sheet about this research)

NOTE: This consent form will remain with the Southern Cross University researcher for their records.

Please answer yes or no to the following statements:

I agree to take part in the Southern Cross University research project specified above.

I have been provided with information at my level of comprehension about the purpose, methods, demands, risks, inconveniences and possible outcomes of this research, including any likelihood and form of publication of results.

I understand that my participation is voluntary.

I understand that I can choose not to participate in part or all of this research at any time, without negative consequence to me.

I understand that any information that may identify me, will be de-identified at the time of analysis of any data. Therefore, any information that I have provided cannot be linked to me (*Privacy Act 1988 Cth*).

I understand that neither my name nor any identifying information will be disclosed or published.

I understand that all information gathered in this research is confidential and it will be kept securely and confidentially for 7 years at the University.

I am aware that I can contact any of the researchers at any time with any queries.

I understand that the ethical aspects of this research have been approved by the SCU Human Research Ethics Committee.

If I have concerns about the ethical conduct of this research, I understand that I can contact SCU Ethics Complaints Officer, who will take the necessary measures.

Participants name:

Participants signature:

Date:

Please tick this box and provide your email address or mail address (confidential) below if you wish to receive a summary of the results:

Email: _____

Mailing address:

Thank you!

Appendix G – Permission Request

Permission Request

Date

[Name]

[Position and Institution]

[Contact detail]

Dear [name]

Re: Research at [name of institution]

This letter is to request your permission to conduct social science research at the [name of institution], using not only its premises but also interviewing women who participate in any activity offered by this institution or who are present at the institution during the days and times that the researchers are conducting this research. MSc Fabiana Rodrigues de Sousa Mast, a PhD candidate from the Institute of Exercise and Health Science at the University of Basel, Switzerland, and myself, Dr Arianne Carvalhedeo Reis, a Postdoctoral Research Fellow from the School of Tourism and Hospitality Management, Southern Cross University, Australia, are the principal researchers involved in this project, which has the financial support of our institutions and of the Swiss Federal Commission for Scholarships for Foreign Students (FCS).

The research project, titled "Preparing for Rio de Janeiro 2016: How the Olympics can improve the health of women living in low-income communities", aims to investigate the rates and levels of physical activity of women living in Cidade de Deus and their perceptions of the sport participation and health legacies to be derived from hosting the 2016 Summer Olympic Games.

Our intention is to apply the Portuguese version of the International Physical Activity Questionnaire in the first phase of this project, then invite some women to be interviewed. The questionnaire application will request the participants to answer 27 questions about their physical activity behaviour as part of their everyday lives. The interview section will consist of one meeting with one of the researchers where we will be asking simple questions

regarding their knowledge and perception of the proposed legacies of the 2016 Olympic Games, their current expectations and whether or not they have already started to experience some impact of the Games on their lives and the lives of their community, particularly as it concerns their access to and participation in sports and physical activity.

The recruitment of participants will need to be done with the help of some staff from your institution as they are the ones who are most knowledgeable about the community they serve. We will need limited resources from the [name of institution] and we would like your approval for that as well. The list is as follows:

- 1) One room for the questionnaire application and the interview, for approximately two hours.
- 2) Approximately 5 hours of one of your staff time to help with the recruitment of participants (this will be done mostly informally, when women visit the institution to participate in some activities, or to drop off or pick up their children from some activities, and therefore should not take too much of the staffs' time. We will also print invitations to be sent home;
- 3) Kitchen facilities to prepare refreshments and snacks for the meetings and to clean it afterwards (we will provide participants and staff who are present at the meeting with a snacks and refreshments).

We aim to arrange interviews for the period of April and June 2012, when the researchers will be in Rio de Janeiro for the study (Dr Reis in April and Ms Sousa-Mast in June). The exact date and time will depend on the availability of the staff and of the participants. We will endeavour to make arrangements that are convenient for all of those involved.

Lastly, we would like to assure you that this research project will be conducted following strict international research ethics guidelines. We have received ethics approval from the Human Research Ethics Committee from Southern Cross University, number **ECN-12-068**.

I hope we have provided you with enough information about this research and the participation of [name of institution] and their staff and community. Please do not hesitate to contact us if you have any question or if you require further documentation to approve our research being conducted in the [name of institution] premises.

We look forward to hearing from you soon.

Sincerely,

Arianne Carvalhedo Reis, Ph.D.