

The built environment and physical activity participation in a semi-urban area in Southern Gauteng

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Abstract

Public health researchers over the years have drawn the attention to the effects of community environments on health conditions such as physical inactivity. Physical inactivity has been reported to be the second leading risk factor for chronic diseases after smoking and contributes significantly to total mortality. A review of literature suggests that the built environment can either facilitate or constrain physical activity participation. The purpose of the study was to examine the influence of the physical environment on physical activity participation among semi-urban residents. A structured questionnaire assessing physical activity participation and the built environment was administered to 148 respondents in a semi-urban township in the Southern part of the Gauteng province, South Africa. A descriptive analysis of the sample was undertaken, followed by the calculation of participants' body mass index (BMI), classification of physical activity and the mean ranking of various environmental factors. Results indicate that respondents' physical activity participation ranged from mild to moderate with majority of the respondents not meeting the minimum physical activity guidelines (30 minutes or more a day, most days of the week of at least moderate physical activity). In addition, the results indicate that the built environment or the lack thereof play an influential role in physical activity participation. Perceived access to various destinations, street planning in the neighbourhood, places for walking and cycling, neighbourhood surroundings, safety from traffic and safety from crime seem to prohibit residents from participation in physical activity. Government, policy makers and environmental planners need to take cognisance of future planning in the development of user-friendly environments so that residents can meaningfully participate in physical activity.

Keywords: Physical environment, built environment, physical activity, land-use mix, walking.

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Introduction

Public health researchers over the years have drawn the attention of the effects of community environments on health conditions such as physical inactivity (Slack, 2006; Boehmer, Hoehner, Wyrwich, Ramirez & Brownson, 2006; Mujahid, Roux, Morenoff & Raghunathan, 2007; Cooper & Theriault, 2008). Physical inactivity has been reported to be the second leading risk factor for chronic diseases after smoking and contributes significantly to total mortality (Wendel-

Vos, Droomers, Kremers, Brug & van Lente, 2007). In the USA for example, national studies show that there are significant differences in physical inactivity in various geographical areas and among demographic groups (Jones, Ainsworth, Croft, Macera, Llyod & Yusuf, 1998). Physical inactivity thus constitutes a major public health concern with related social and economic costs (Colditz, 1999; De Bruijn, Kremers, Lenavelt-Mulders, de Vries, van Mechelen & Brug, 2006).

In South Africa, studies on the patterns and prevalence of physical activity among black men and women living in the Cape Peninsula revealed that the least active groups were those between the ages of 25-34 years (54%) and those aged between 45-64 years participated predominantly in light intensity activities (58%) (Sparling, Noakes, Steyn, Jordaan, Jooste & Bourne, 1994). Only a small proportion (2.8%) engaged in strenuous physical activity. A study conducted in the North-West Province in an urban and rural community (Kruger, Venter & Vorster, 2003) revealed that more than half of the participants in the study were inactive as only 29% and 28% respectively, were classified as either inactive or moderately active.

In 2003, the International Physical Activity Questionnaire (IPAQ) was administered in South Africa as part of the World Health Survey (n=2014) which included samples from urban and rural communities (Lambert & Alexander, 2005). The survey found that only one-third of South Africans met the American College of Sports Medicine and Centres for Disease Control and Preventative's recommendations (30 minutes or more a day, most days of the week of least moderate intense physical activity) for health-enhancing physical activity and nearly half were reportedly inactive (WHO, 2005). The results from the 1998 Demographic and Health Survey suggest that overweight and obesity affect more than 55% of South African women (Department of Health, 2002) which have important health consequences and are associated with the increased risk for Chronic Disease of Lifestyle (CDL).

Physical environment and physical activity

Through the years, researchers have moved away from individual theories such as the theory of motivation to ecological approaches to identify correlates of physical activity (Cerin, Saelens, Sallis & Frank, 2006; Norman, Nutter, Ryan, Sallis, Calfas & Patrick, 2006; Saelens, Sallis & Frank, 2003). Ecological models have often been used to explain physical activity participation (Robertson-Wilson, Lévesque & Holden, 2007) where the environment plays a crucial role in promoting physical activity (Craig; Cameron, Russell & Beaulieu, 2001). A central focus of ecological models is "the role of physical environment, recognising that environments themselves and people's behaviour within them are shaped by social and organisational influences" (Humpel, Owen & Leslie,

2002:188-189). This suggests that human actions are affected by individual intrapersonal factors, culture, social systems, public policy, and the physical environment (Bengoechea, Spence & McGannon, 2005; Pikora, Bull, Jamrozik, Knuiiman, Giles-Corti & Donovan, 2002). Hence, the ecological perspective places greater emphasis on determinants within the social and physical environment, rather than only on the individual.

The built or physical environment refers to all human-formed or developed areas within an area, which is broadly classified by size into macro (sectors common to the wider population) and micro (settings close to the individual) sectors (Boehmer, et al., 2006). Macro environmental influences of physical activity include urban sprawl, land-use mix, transportation systems, street networks and population density (Frank, Andresen & Schmid, 2006). Within the micro environmental neighbourhood settings, access and proximity to facilities (e.g. bike paths, parks and shops), safe streets, aesthetics and presence of sidewalks may affect physical activity. Together these elements shape access to opportunities for physical activity. The terms built environment and physical environment as used in previous studies (Santos, Page, Cooper, Ribeiro & Mota, 2008; Brownson, Hoehner, Day, Forsyth & Sallis, 2009) are also used interchangeably in this study. A review of literature suggests that the built environment can facilitate or constrain physical activity (Booth, Pinkston, Walker & Poston, 2005). Walking and cycling as a mode of transport, community design characteristics such as conditions of sidewalks, presence of bike-paths, street design, traffic volumes and speed and crime may also play an integral role in physical activity participation (Cooper & Theriault, 2008).

Research drawn from different fields supports the contention that the physical environment has significant associations with physical activity (De Bourdeaudhuij, Sallis & Saelens, 2003). Humpel, Owen and Leslie (2002) reviewed literature from a behavioural science perspective on accessibility to recreational facilities and opportunities for physical activity, revealed that aspects of the environment were significantly related to physical activities. Saelens, Sallis, Black and Chen (2003) reviewed studies from the transportation and urban planning fields and found a positive relationship between neighbourhood environment and physical activity participation, i.e. neighbourhoods with proper facilities such as bike paths, walking trails and appealing environmental aesthetics encourage physical activity participation. Reed and Phillips (2005) examined the relationship between proximity and physical activity found a positive association between proximity and physical activity i.e. closer proximity to shops and other amenities in the neighbourhood encouraged physical activity participation. Transportation studies indicate that people living in neighbourhoods characterised by higher residential density, a mixture of land uses (residential and commercial) and grid-like street patterns with short block lengths engage more by walking and cycling than do people

living in sprawling neighbourhoods (Saelens et al., 2003). A study on environmental influences on physical activity (French, Story & Jeffrey, 2001) revealed that the availability of parks, recreation space and facilities impact on physical activity.

Another dimension of the built environment that has been known to correlate with adult physical activity is access to recreation facilities such as trails, swimming pools and gymnasiums (Humpel, et al., 2002; McCormick, Giles-Corti, Lange, Smith, Martin & Pikora, 2004). Brownson, Baker, Housemann, Brennan and Bacak (2001) found similar associations with sidewalks, enjoyable scenery, aesthetics, heavy foot traffic and hills with increased levels of physical activity. Factors such as crime, damaged sidewalks, lighting and stray dogs have also been found to impact on physical activity participation (Prochaska, 2009). Aesthetics includes having interesting things to see or experience in an environment, such as green spaces, cleanliness and having a variety of building designs in the area. Lee and Moudon's (2003) study found that utilitarian destinations were positively associated with walking for transportation, whereas sidewalks and hills were positively associated with walking for recreational purposes. Ball, Bauman, Leslie and Owen (2001) investigated the relationships between individuals' perceived environment, walking, physical and mental health and physical activity. Their results showed that environmental aesthetics, convenience and having someone to exercise with were positively associated with walking. This demonstrates that the physical or built environment is also important in providing cues and opportunities for physical activity (Brownson, Chang, Eyster, Ainsworth, Kirtland & Saelens, 2004).

Problem statement

The association between environmental factors and physical activity and recreation in general is an emerging research topic with a steady growth in USA and UK. A small but growing health literature on this subject documents numerous environmental variables and physical activity but provide few definitive explanations (Humpel, et al., 2002). Although most studies on the built environment and physical activity and recreation have been conducted in the USA and UK, there is a need to examine variation in environmental factors in other countries (De Bourdeaudhuij, et al., 2003). In addition, townships and semi-urban areas may have important differences from urban areas due to disparity within the physical environment relating to activity-related design features (Saelens, et al., 2003). In South Africa, a gap remains in such types of studies, which would contribute enormously to our understanding of the multi-faceted elements of the physical environment in relation to physical activity and recreational pursuits. Identifying infrastructural inadequacies within communities and its relationship with the built environment may act as catalysts for physical activity, which may assist in the development of interventions and

policies to enhance and sustain active lifestyles, and reduce escalating obesity rates and resultant incidence of chronic diseases (Boehmer et al., 2006).

The purpose of the study is to examine the influence of the built environment on physical activity participation in a semi urban area in Southern Gauteng, South Africa.

Methodology

A cross-sectional design was used through a self-reported survey data collected from face-to-face interviews. The research design explained in the foregoing section entailed the selection of the sample, questionnaire construction and data collection on the built environment and physical activity participation levels.

Sample

A random sample of participants was drawn from one semi-urban area located in Southern Gauteng in order to reflect on their socio-economic background, levels of physical activity/inactivity and walk ability (proximity of routes from home to destinations) (Mulvihill, Rivers & Aggleton, 2000). Every second household was selected in each street. Where no eligible respondents were found in the household, the next household was approached to participate in the survey. Both male and female respondents were chosen for the study. Respondents were chosen using the following criteria: (1) living within the identified neighbourhood, (2) being 18 to 65 years old, and (3) not having a disability that precluded walking.

Study area

The study was conducted in Bophelong, semi-urban residential township in Southern Gauteng, South Africa. Bophelong is a former black township on the outskirts of the industrial town of Vanderbijlpark. In the late nineties, the area was extended with the construction of 10,000 new low cost houses. The average household size in Bophelong, derived from Statistics South Africa (SSA) data (2007) is three persons per household. The size of Bophelong is approximately 9 square kilometers with a shopping complex and informal shops and markets. However, there are no recreational facilities in Bophelong. Sekhampu (2004), in his study found 62 percent of the population to be living below the poverty line, hence classified as a low SES neighbourhood. A follow up study by Slabbert and Sekhampu (2009) revealed that 66.3 percent of the residents of Bophelong are poor and that the unemployment rate is 62.2 percent.

Measuring instrument

A modified version of the Neighbourhood Environment Walkability Scale (NEWS) designed to obtain residents' perception of how neighbourhood characteristics assist in physical activity participation was used (Saelens et al., 2003; Bourdeaudhuij et al., 2003). The necessary adjustments were made to the questionnaire to suit the local environment. The questionnaire contained questions on residential density, proximity to and access to non-residential land uses such as restaurants, retail stores, and street connections, walking/cycling facilities such as sidewalks and pedestrian/bike trails, aesthetics, traffic and crime safety. With the exception of residential density, Likert format questions were used where items ranged from 4 (strongly agree) and 1 (strongly disagree) with higher scores indicating a more favourable value of the environment characteristics.

Leisure time physical activity was assessed with the Godin-Shepard Leisure Time Exercise Questionnaire (Godin & Shepard, 1985). The questionnaire also included demographic questions on age, height, weight, gender, race, income and residential area. Body mass index (BMI) was calculated as kg/m^2 and overweight was defined as $\text{BMI} > 25$. The Body-Mass Index (BMI) is a confirmatory mechanism for determining obesity and infers that higher BMIs are associated with chronic diseases, especially coronary heart disease (Kruger, Venter, Vorster & Margetts, 2002). Height and body weight were self-reported measures which respondents were required to report in the biographical section.

Data collection

Face-to-face on-site survey via a structured questionnaire was used in data collection. Face-to-face interviews were used because of the ease of administration. Postgraduate students in the faculty of Economic Sciences and Information Technology of the North-West University, South Africa, conducted the interviews. The students had to attend a two-hour training session on fieldwork and administration. Fieldworkers had to be proficient in English and one or more of the African languages in order to facilitate data collection. Respondents were under no obligation to participate in the survey if they wished not to do so (Malete, Sullivan & Matthies, 2008). In order to ensure proper data collection, students were monitored daily by the researchers and a doctoral student. To guarantee anonymity of responses, participants were asked to avoid writing their names on the questionnaires. Of the 199 questionnaires administered, 14 respondents declined to participate. A total of 37 questionnaires were discarded due to incomplete responses. Eventually, 148 questionnaires were used for analysis. The sample size is consistent with those of previous studies undertaken on physical activity participation (Saelens et al., 2003; Bourdeaudhuij, et al., 2003).

Reliability and validity

Interclass correlation coefficients (ICC) were computed to assess reliability (Evenson, & McGinn, 2005). As a guide the following rating as suggested by Landis and Koch, (1977) is acceptable: between 0-.20 (poor); between 0.2-0.4 (fair); between 0.4-0.6 (moderate) and between 0.60-0.80 (substantial). Pearson's correlation coefficients were calculated for each item among the various built environment variables. The reliability coefficients ranged from 0.021 to 0.65 thus providing evidence of reliability. Content validity was established through modification of neighbourhood environment walkability scales (NEWS) and a review of the scale with four sport management academics.

Results

The empirical results presented in this section comprise the following steps. The demographic characteristics of the sample are reported, followed by the results of the built environment measures, namely, residential type, access to facilities, streets in the neighbourhood, places for walking and cycling, neighbourhood surroundings, safety from traffic and safety from crime.

Demographic profile

Cumulative frequency analysis was conducted on the respondents' demographic characteristics. There was a fairly equitable distribution of male (n=69; 46%) and female (n=79; n=54%) respondents. The sample distribution in terms of age were as follows: age group 18 to 25 years (n= 54;36 %), 26 to 33 years (n= 39; 26 %), 34 to 41 years (n= 17;12), 42 to 49 years (n=15;10 %), 50 to 57 years (n= 8.5 %), 58 to 65 years (n= 11; 7%), and over 65 years (n=5; 3%). A large proportion of the sample were unemployed (n=111; 75%). In terms of their current health status, majority (n=27; 45%) reported their health to be good, while a large proportion of the sample (n= 38; 25.7%) reported their health status to be satisfactory. Detached single family homes were a common feature in the neighbourhood.

Table 1 reports on the body mass index (BMI) classified by the gender of respondents in terms of underweight, normal weight, overweight and obese. The classification was based on the World Health Organisation (WHO) categorisation.

Table 1: Body mass index (BMI) of respondents

*Categories	Male	%	Female	%
Underweight (BMI: below 18.5)	0	0	0	0
Normal weight (BMI: 18.5 to 24.9)	20	29	8	10
Overweight (BMI: 25.0 to 29.9)	22	32	17	22
Obese (BMI: 30.00 and above)	27	39	54	68
Total	69	100	79	100

*Source: World Health Organisation: International Classification of weight according to BMI (2005).

Table 2 provides an exposé of the various intensities of physical activity grouped in terms of strenuous, moderate, mild exercise and walking (per week).

Table 2: Physical activity intensity

Categories (n=148)	Male (n= 69)		Female (n=79)		Total	
	No	%	No	%	No	%
Strenuous exercise (The heart beats rapidly, for example, running, jogging, soccer, hockey, squash, basketball, cross-country, vigorous swimming, long distance cycling)	5	3	4	3	9	6
Moderate exercise (Not exhausting- similar to how you feel when you are walking as if you are going somewhere, fast walking, easy cycling, volleyball, badminton, easy swimming, dancing household washing, cleaning, laundry washing)	4	3	7	5	11	8
Mild exercise (Requires minimal effort such as yoga, archery, fishing, and bowling).	10	7	8	5	18	12
Walking (Walking from home, place to place, and any other walking that you might do solely for recreation)	65	44	45	30	110	74
Total	84	57	64	43	148	100

Mean ranking of built environment factors

The study examined neighbourhood built environment in terms of the following aspects:

- access to basic facilities such as local stores and taxi ranks,
- street planning, in terms of walkways, dead-end streets, and alternative routes.
- access to walking and cycling such as sidewalks (pavements), bicycle or pedestrian trails and open spaces.
- neighbourhood surroundings, such as scenery created by the environment such as trees, natural sights developed by landscaping with aesthetics, free from litter and sufficient lighting provided by the local government (municipality).
- Safety from traffic and traffic calming measures in the neighbourhood.
- Safety from crime during the day and night.

Table 3 provides an overview of respondents’ mean ranking of the facilities that are necessary within the community. The mean rankings are set in ascending order of respondents’ perceptions.

Table 3: Mean ranking of the built environment facilities (ascending order)

Categories of environmental planning	N	Mean	SD
Walking and cycling	148	2.26	0.39
Safety from crime	148	2.21	0.32
Traffic safety	148	2.20	0.22
Street planning	148	1.92	0.23
Facility access	148	1.80	0.30
Neighbourhood surroundings	148	1.60	0.45

Discussion

Body mass Index

In terms of respondents' BMI, none of the respondents reported that they were underweight. However, only 28 respondents (male=20; females=8) were within acceptable weight category, with a fairly large number of respondents being overweight (males=22; females= 17). However, on an alarming note, a majority of the respondents reported to be obese with females (n=54) having much higher levels of obesity compared to their male counterparts (n=27). Considering the results in Table 1 it can be seen that 71% of males and 80% of females are either overweight or obese. It has been well-documented that regular moderate-intensity physical activity, including moderate walking can assist to improve health and reduce the risk of developing many chronic diseases, including cardiovascular diseases, diabetics and reduced risk of developing depression (Kesaiemi, Danforth, Jenson, Kopelman, Lefevre & Reeder, 2001; Gebel, Bauman & Petticrew, 2007). Despite the documented evidence of physical, psychological and social benefits of regular physical activity, physical inactivity in this community remains precarious.

Physical activity intensity

In terms of participation in physical activity in a typical week, both male (n=5) and female (n=4) respondents seem to participate less in strenuous activities. Reported results of moderate physical activities also seem to follow the same patterns with females (n=4) and females (n=7) showing some basic levels of participation in activities such as cycling, dancing, and sport activities. Mild exercises such as exercise, fishing and bowling also do not seem to some precedence with male (n=7) and female (n=8) respondents. However, walking seems to be a predominant physical activity for male (n=65) and female (n=45) respondents from home to work or to business centres. These results are not surprising as most of the respondents surveyed were unemployed and walked to destinations for their utilitarian needs.

Mean ranking of neighbourhood built environment planning

Summated means were computed regarding the various built environment factors that may pose a barrier or encourage physical activity participation in the

neighbourhood. The various built environment factors were based on a series of four-point Likert scales. With regard to **facility access**, majority of the respondents agreed that it poses a problem in terms of walking to facilities (M=1.80) such as the taxi rank, bus terminal and local stores. Respondents agreed that the **streets in the neighbourhood** were not conducive for walking (M=1.92). Respondents also were of the view that there are **inadequate places for walking and cycling** (M=2.26) in the neighbourhood as there are no sidewalks, bicycle or pedestrian trails with very little open spaces where residents can walk. With regard to **neighbourhood surroundings**, respondents viewed the surroundings as unattractive (M=1.60) with no trees and attractive landscaping. In addition, litter poses a problem in the neighbourhood, thereby creating an unsightly environment. **Traffic in the neighbourhood** (M=2.20) makes it difficult to walk with no traffic calming measures such as speed humps and posted maximum traffic limits. Finally, **safety and high crime rate** (M=2.21) in the areas make it unsafe for residents to walk in the neighbourhood with no street lights.

Respondents in the neighbourhood recorded a high level of unemployment (n=111; 75%). Slabbert and Sekampu (2009) determined the unemployment rate in Bophelong at 62.2%, and there is on average one unemployed person per household. Several indicators of low socio-economic status (SES) in semi-urban areas with low income or high unemployment were found by previous researchers to be associated with individual's low level of physical activity (King, Belle, Brach, Simkin-Silverman, Soska & Kriska, 2005). Most residents hang out on the streets or walk short distances to visit a neighbour. In addition, residents in low SES neighbourhoods may have fewer options for transportation and have to rely on walking. A visible walking culture may encourage neighbourhood residents to be more active. It has been found that neighbourhoods in urban areas are typically associated with pedestrian-friendly features such as sidewalks, denser interconnected networks of streets and a mix of business and residence (Handy, 1996). It therefore seems that the lack of proper planning in terms of streets, places for walking and cycling, traffic calming measures and safety and security in the neighbourhood prohibits residents from physical activity participation.

The physical design of environments commencing from placements and its location away from towns and cities has a direct impact on the ways in which people behave, interact and thrive (Frank, Engelke & Schmid, 2003). These built environmental features reflect distance between places (proximity) and ease of travel between places (connectivity) (Saelens et al., 2003). Factors such as the distance between a person's residence and a shopping centre can influence the decision to either walk or drive to a destination (Norman et al., 2006). Studies have also found that people who live in more walkable communities (i.e. communities whereby it is easy to commute to numerous destinations) are more physically active and less overweight than people in less walkable communities (Berrigan & Troiano, 2002; Giles-Corti, Macintyre, Pikora & Donovan, 2003). This study is congruent with a study

undertaken in Perth, Australia where it was found that residents living in low SES areas were less likely to undertake adequate physical activity than residents in high SES areas (Giles-Corti et al., 2003). In a US study undertaken by Fisher, Li, Michael and Cleveland (2004) it was found that residents within low economic status reported lower levels of active walking.

In summary, and combined with the results from previous researchers, it appears that there is support for the assertion that the built environment characteristics are related to both design and recreational resources. This explains in part, the variance or the lack of physical activity participation in a neighborhood (De Bourdeaudhuij et al., 2003).

Recommendations and implications for environmental planners

While semi-urban areas (often referred to as townships) is a legacy of the previous government, pre-1994, much still remains to be done by the current government to address the racial and ethnic disparities that exist in environmental neighbourhood planning and access to parks and recreation environments. Inequality in the built environment underlies the key health disparities in physical activity and obesity in communities (Powell, Slater & Chaloupka, 2006). Public spending on parks and recreation and open spaces in low economic communities still lags behind compared to spending in areas that are more affluent.

Although sport continues to claim a substantial proportion of state funded “leisure and recreation resources” in countries like Britain, US and Australia, imperatives around the “obesity epidemic” have produced a discursive context in which the health benefits of creating facilities for active leisure and recreation need to be enhanced and given greater prominence in South Africa (Gard & Wright, 2001). An extended recasting of the importance of physical activity is necessary through a conceptual mind shift by the government environmental planners in order to enhance peoples’ opportunities and experiences of physical activity participation through an appropriate built environment plan. Previous work has demonstrated that encouraging physical activity requires a broad range of approaches such as government intervention in making such semi-urban areas more livable with near access to business and facilities for communities to make healthy choices (Hoehner, Brennan, Elliot, Handy & Brownson, 2005). This may just provide the necessary impetus for residents in semi-urban areas to actively engage in physical activity and appreciate the benefits thereof. It is not about opulence that such communities require, but they need the basics in terms of infrastructure and environmental planning requirement so that they can voluntarily participate in physical activity. After 18 years of democracy, it is time to revisit the physical environmental planning through different lenses so that the previously disadvantaged interpret and appreciate the meaning of physical activity and its positive outcomes. In doing so, the economic cost of health provision in such communities may be reduced through

the appreciative benefits such as lowered risk of obesity and cardiovascular diseases (Roberts & Fagan, 1999).

There is a clarion call for local and provincial governments to move beyond power and the theorisation of leisure and recreation in current South African setting, especially in disadvantaged communities and place the benefits of proper environmental planning in socio-economic agendas. In this way, greater prominence may be afforded to communities to engage in recreational pursuits, which may emancipate themselves from risk of obesity and various other associated diseases (Wright, MacDonald & Groom, 2003).

The density of interconnected networks, presence of sidewalks, bicycle trails, jogging trail, mix of businesses and residential areas, and building characteristics (double-storey/flats) has been shown to be a viable inclination to walking (high presence of it) and should be taken into account in environmental planning (Berrigan & Troiano, 2002). Policy makers and environmental planners need to consider how to build communities so that they facilitate physical activity for transport, recreation and other purposes. If residents live within walking distance of businesses or facilities, they tend to make functional walking trips and participate in more physical activity than those residents whose facilities that are located further away thus, increasing their physical activity levels (King, et al., 2005).

Limitations

The study examined a small section of the built environmental influence on physical activity participation and in one semi-urban area. Therefore, generalisation of the results should be viewed with caution. Further studies are warranted in similar settings in order to validate the results. The study was focused on people aged above 18 years. Youth at lower age categories were not considered in the study and they may be prone to physical inactivity. Further studies should consider a youth cohort in order to enhance an understanding of the impact of the built environment on their physical activity participation. Using-researcher defined areas (such as semi-urban area) may have some limitations. Further studies are necessary especially in established urban settings so that comparisons could be made in order to obtain conclusive results on environmental planning implications.

The findings of this study underscore the complexities associated with measuring environmental supports for physical activity and the understanding of the mechanisms through which the environment influences behavior towards physical activity (Boehmer et al., 2006). Other variables that may influence inactivity in physical activity participation such as gender, socio-economic status, perceived exercise benefits, self-esteem, self-efficacy, motivation, and knowledge which were not addressed in the present study may be examined in future research (Li, Fisher & Brownson, 2005).

Conclusion

Understanding factors such as access to facilities, streets in the neighbourhood, places for walking and cycling, neighbourhood surroundings, traffic safety and safety from crime along with neighbourhood SES that affect physical activity in communities will be useful for creating interventions that are sensitive to possible barriers to physical activity among semi-urban residents with limited infrastructure and facilities. Notwithstanding the limitations of the study, some useful insights into the factors that have an influence on physical activity were investigated. Fewer combinations of facilities such as parks and recreation facilities, business facilities, may lead to decreased opportunities for residents to engage in physical activity. The findings provide important information to assist policy makers in making healthy recommendations in that the data provided are consistent with the way resources are provided in semi-urban areas.

Moreover, capturing and providing data within geographical areas provide politically relevant information needed to change the existing infrastructure requirements in semi-urban areas. The challenge is to present these types of data in way that will persuade the relevant authorities to allocate resources that make a difference in the lives of those living in such areas.

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