EXAMINATION OF PUBLIC PARKS FOR PHYSICAL ACTIVITY PARTICIPATION BY THEIR LOCATION, SIZE AND FACILITIES

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ABSTRACT

The purpose of this study was to examine park users' Physical Activity (PA) participation in three different public parks with identical differences in location, size and facilities in Ankara, Turkey. System for Observing Play and Recreation in Communities – SOPARC (McKenzie et al., 2006) was used for data collection. The results indicated significant differences in use of parks for PA (p<0.05). Most frequently used park for PA participation was in a centralized location with a larger park and activity areas. Park users for PA were mainly adults (67.5%). Most preferred activity was walking (80.6%). People used the parks for PA more on Tuesday (18.1%) and in the evening (41.3%) time period. These findings indicated that location, size and facilities in a park are important for PA participation. Municipalities should organize the parks according to the parks users' preferences and needs.

Key Words: *Physical Activity, Public Parks, Systematic Observation*

INTRODUCTION

Physically inactive lifestyle has become a significant public health issue in Turkey as well as in other developed and developing countries (Turkish Ministry of Health, 2004; WHO, 2010). Recent research evidence indicated that Turkish citizens who were above 18 years of age were generally preferred sedentary lifestyles (20.32%) and 15.99% of them were not sufficiently physically active (Turkish Ministry of Health, 2004). This report also indicated that only 3.5% of the adults who were above 30 years of age participated in regular physical activity (PA), at least 30 minutes of moderate to vigorous PA for 3 days in a week. Other studies examining PA behaviors of school age children indicated high inactivity rates (Cengiz, Ince and Cicek 2009; Kin-Isler, Asci, Altintas and Guven-Karahan, 2009; Ince and Ebem, 2009). According to studies in both adult population and school aged children, women were more at risk of inactivity than men (Turkish Ministry of Health, 2004; Cengiz, Ince and Cicek, 2009).

Social-ecological model assumes that PA behavior, similar to the other health behavior, is improved when environment and policies support the target behavior of people (McLeroy, Bibeau, Steckler and Glanz, 1988; Stokols, 1992). In

social-ecological approach, social environment (such as influence of significant others, community norms, cultural background); physical environment (such as availability and access to facilities, quality of facilities, safety, public transports); public policies (such as urban planning, educational, health, environmental policies) should be considered with individual level influences (such as knowledge, attitudes, PA skills) to better understand the PA behavior of people (Stokols, 1992).

Even though individual level influences to PA behavior was described very well in the literature, influences of social environment, physical environment and policy issues has recently taken a greater interest from the researchers (Sallis, Cervero, Ascher, Henderson, Kraft and Kerr, 2006; Cochrane and Davey, 2008; Sallis et al., 2009). Especially, providing environmental supports including public parks have accepted as one of the most promising method to promote PA in some of these studies (Floyd, Spengler, Maddock, Gobster and Suau, 2008; Reed, Morrison and Arant, 2009). A review by Kaczynski and Henderson (2008) indicated that public park areas and recreation settings had statistically significant effects on PA participation. Public park areas promote PA participation because of easy access and open facilities provided

for all people at all ages (Bedimo-Rung, Mowen and Cohen, 2005; Cohen, McKenzie, Sehgal, Williamson, Golinelli and Lurie, 2007; Reed et. al., 2008).

Considering the socio-cultural and physical environment for PA unique to each country, number of comparative studies about the PA neighborhood enviro-nment has been increased (Sallis et al., 2009). However, comparisons in these studies were mainly included the western or developed countries. There is a lack of research exami-ning the physical environment, especially focusing on the park and recreation area, use by the people in developing countries. As a developing country, Turkey is an interesting example with its cultural background, developing economy and approximately 70 million populations. Geographically a part of the country is in Europe and the other part is in Asia, and it includes both western and eastern socio-cultural influence. Despite the current efforts to increase the public awareness about the importance of PA participation in Turkey, there is still a lack of information about the use of public parks for PA. This knowledge is necessary for health promotion specialist as well as park area planners. Having information about the use of park areas for PA in Turkey, also provide necessary evidence to use in cross cultural comparisons.

Therefore, the purpose of this study was to examine park users by

sex, age group, activity preferences, activity day and time preferences in three different public parks with identical differences in location, size and facilities in Ankara, Turkey.

METHOD

Park selection

Public parks were selected on the basis of their location, size and facilities. Demographical features of the selected public parks were presented in Table 1.

As presented in Table 1, each park has varied in location, size and facilities. The Park A was in a centralized location (i.e., 850m to the center of the city) as compared to the Park B and Park C (i.e., 7.2 km to the center and 6.7 km to the center, respectively). In terms of the size of the public parks, the Park A was large-in-size (110,000 m^2), the Park B was moderate-in-size (11,000 m^2), and the Park C was small-in-size (4,141 m^2), relatively. According to the Turkish Statistical Institute, the socioeconomic status (SES) of the neighborhood in which the public parks were located is categorized as high.

Although all the three public parks were located in high SES neighborhood, the facilities provided in the parks varied due to the size of the parks. There was no alternative public park for PA participation near the selected parks. All of the three public parks were located very close to the houses / apart-ments and schools. Considering their facilities, Park A had a walking path, two separate areas with fitness equipments, table tennis areas, playground, cafes, grass areas, and banks for sitting. Although the facilities in Park B were categorized as poor because there was no area with fitness equipment, still it had two separate walking paths, grass area, playground, and banks for sitting. The Park C had a walking path, area with fitness equip-ment, basketball court, play-ground, and banks for sitting. The Park A and Park B had no facilities for team sports, like basketball court, football area, volleyball court and etc. Only the Park C had a basketball court. In the three public parks, there were also no organized activities for community and for elder people.

Table-1
Demographic characteristics of the public parks

	Park A	Park B	Park C
Location	Central	Suburban	Suburban
The distance to the city center	850 m	7.2 km	6.7 km
Size	Large	Medium	Small
The size in m²	110,000 m²	11,000 m²	4,141 m²
Socioeconomic status (SES)	High	High	High
Facilities	Good	Poor	Moderate
The number of PA facilities	One walking path Two separate areas with fitness equipments Other areas	One walking path No area with fitness equipments Other areas	Two walking paths One separate area with fitness equipments Other areas
Year of construction	1999 (renewed)	2000	2006

INSTRUMENTATION

SOPARC which is a valid and reliable direct observation instrument (McKenzie, 2002) was used to examine the use of the public parks for PA. It is designed to make observation in open envir-onments such as public parks to obtain information about the number of participants, their sex, age, PA preferences, and also to provide contextual information about the setting in which PA occurs. It is based on momentary time sampling. Observation occurs one at a time to count the participants in the observed areas (McKenzie et. al., 2006).

As the public parks are very complex settings to observe, there is a need to virtually divide the whole park area into smaller areas (sub-target areas). Moreover, the time of the day in which the observations take place should also be predetermined in accordance with the SOPARC description and procedures manual (McKenzie and Cohen, 2006). Therefore, in each sub-target area, the observers make four different observations in the predetermined time periods inclu-ding morning, noon, afternoon, and evening time periods at 7:30AM; 11:30AM; 3:30AM; and 6:30AM, respectively. For accurate obser-

vations, the observers should make simultaneous scans for females and males separately with the information about their age groups (child, teen, adult, and senior) and PA levels (walking and vigorous).

DATA COLLECTION PROCEDURE

Before the actual data collection was occurred, the observers practiced 3-day training by using SOPARC manual. At the end of these training days, the observers became familiar with this methodology. The actual data collection was taken place in August, 2009 within a consecutive 7-day periods for each public park.

Three independent observers made their observation in each subtarget area separately. The subtarget areas were: (a) walking path, (b) the area with fitness equipments and (c) the other free activity areas, including the area with table tennis, basketball court, cycling area, grass area and the like. Moreover, each sub-target area in each public park was observed within a 7-day period, for an hour at four different time periods. Totally 252 different observation sessions were performed. Among these total observations, 10 observation sessions were randomly selected for reliability data. The reliability percentages were calculated with the use of van der Mars's equation (1989). The interater reliability for different variables was changing between 72.2 and 99.1% for different variables [sex = 98.16% (97.17% for women and 99.11% for men); age

groups = 94.22% (92.59% for child, 95.24% for teen, 95.11% for adult, 91.18% for senior); PA preferences = 94.92% (97.48% for walking and 72.22% for vigorous)]. Level of inter-rater reliability was good (van der Mars, 1989).

DATA ANALYSIS

The simple descriptive statistics were used to determine the frequencies and percentages of participants by sex, age group, PA preferences and the day and time preferences for the use of the park areas. The chi-square analyses were used to compare three public parks ($p < .05$).

RESULTS
Descriptive analyses of the public parks

The results of the descriptive analyses are presented Table 2. At the end of a seven-day observation of each park, a total of 3119 park users were observed. The most frequently used park was the Park A with a total of 2287 (73.3%) park users. There were 323 (10.4%) park users in Park B and 509 (16.3%) in Park C. There were a total of 1585 (50.8%) women park users and 1534 (49.2%) men park users. Among all of the park users, 311 (10%) of them were categorized as child, 341 (10.9%) of them were categorized as teen, 2105 (67.5%) as adults, and 362 (11.6%) as senior (older adults). Most of the park users (80.6%) were generally used the park for walking activity, rather than vigorous PA (19.4%). The most frequently used

days were Tuesday with a total of 566 park users and Saturday with a total of 507 park users. The least frequently used days were Friday (*n* = 309) and Thursday (*n* = 335). Among the four different time periods of a day, the most frequently used time period was evening time (41.3%) and morning time (36.4%). At noon and afternoon time periods (9% and 13.3%, respectively), there was apparently fewer park users.

Comparison of the public parks
Table 2 presented the chi-square analyses of the public parks with the park users' sex, age group, PA preferences and their day and time period preferences. According to the analysis, there were significant differences in the public parks by the park users' sex, PA preferences and the day and time preferences ($p < .05$). However, the park users' age group was not significantly different among the parks.

Table-2
Park users' demographic characteristics and the use of the public parks for PA within a day and time periods

	Park A		Park B		Park C		Total				
	n	%	*n*	%	*n*	%	*n*	%	χ^2	*df*	*p*
Total	2287	73.3	323	10.4	509	16.3	3119	100			
Sex									8.12	2	.017*
Women	1135	49.6	162	50.2	288	56.6	1585	50.8			
Men	1152	50.4	161	49.8	221	43.4	1534	49.2			
Age Group									5.79	6	.447
Child	229	10.0	31	9.6	51	10.0	311	10.0			
Teen	263	11.5	29	9.0	49	9.6	341	10.9			
Adult	1519	66.4	228	70.6	358	70.3	2105	67.5			
Senior	276	12.1	35	10.8	51	10.0	362	11.6			
Physical Activity									57.64	2	.000*
Walking	1771	77.4	282	87.3	462	90.8	2515	80.6			
Vigorous	516	22.6	41	12.7	47	9.2	604	19.4			
Days									97.11	12	.000*
Monday	318	13.9	40	12.4	80	15.7	438	14.0			
Tuesday	402	17.6	49	15.2	115	22.6	566	18.1			
Wednesday	342	15.0	29	9.0	96	18.9	467	15.0			
Thursday	240	10.5	47	14.6	48	9.4	335	10.7			
Friday	252	11.0	39	12.1	18	3.5	309	9.9			
Saturday	330	14.4	64	19.8	113	22.2	507	16.3			
Sunday	403	17.6	55	17.0	39	7.7	497	15.9			
Time Periods									290.52	6	.000*
Morning	837	36.6	106	32.8	193	37.9	1136	36.4			
Noon	278	12.2	4	1.2	0.0	0.0	282	9.0			
Afternoon	390	17.1	10	3.1	14	2.8	414	13.3			
Evening	782	34.2	203	62.8	302	59.3	1287	41.3			

* *p* < .05

Sex by public parks

The chi-square analyses indicated that there was a statistically significant difference between the park users' sex among the three public parks, χ^2 (2, 3119) = 8.12, $p < .05$. More specifically, 1135 (49.6%) of the Park A users were women, and 1152 (50.4%) of them were men. 162 (50.2%) of the Park B users were women, 161 (49.8%) of them were men. 288 (56.6%) of the Park C users were women, and 221 (43.4%) of them were men. Overall, it can be inferred that there was a small but significant difference between women and men park users in favor of women by the public parks. These findings also indicated that suburban parks were preferred with more women as compared to men counterparts.

Age group by public parks

According to the chi-square analyses with age group and public parks, the results indicated no statistically significant difference between the public parks, χ^2 (6, 3119) = 5.79, $p = .45$. Although the descriptive analyses indicated a higher percentage of adult park users; this difference was not statistically significant (See Table-2).

Physical activity preferences by public parks

The results indicated that there was a significant difference between the parks users' PA preferences by public parks, χ^2 (2, 3119) = 57.64, $p < .05$. More specifically, in Park A, the walking activity was more apparent (77.4%) than the vigorous activity (22.6%). Similar results were also seen in Park B (87.3% for walking and 12.7% for vigorous activity) and in Park C (90.8% for walking and 9.2% for vigorous activity). Moreover, the Park C users were more frequently preferred walking activity than the Park B and Park A users. However, the Park A users were more frequently preferred the vigorous activity than the Park B and Park C users.

Day preferences by public parks

There was a significant differences in park users day preferences for PA, χ^2 (12, 3119) = 97.11, $p < .05$. In Park A, 13.9% of the park user attended PA on Monday, 17.6% of them on Tuesday, 15% of them on Wednesday, 10.5% of them on Thursday, 11% of them on Friday, 14.4% of them on Saturday, and 17.6% of them on Sunday. In Park B, 12.4% of them on Monday, 15.2% of them on Tuesday, 9% of them on Wednesday, 14.6% of them on Thursday, 12.1% of them on Friday, 19.8% of them on Saturday, and 17% of them on Sunday. In Park C, 15.7% of them on Monday, 22.6% of them on Tuesday, 18.9% of them on Wednesday, 9.4% of them on Thursday, 3.5% of them on Friday, 22.2% of them on Saturday, and 7.7% of them on Sunday. Overall, the most frequently used days were Tuesday

and Sunday for Park A, Saturday and Sunday for Park B, and Tuesday and Saturday for Park C. It could be inferred that the weekends and one of the weekday (Tuesday) were mostly preferred days for attending public parks for PA participation.

Time period preferences by public parks

According to the chisquare analysis, there was a significant difference between the time period preferences of park users for PA by parks, χ^2 (6, 3119) = 290.52, $p < .05$. More specifically, the evening time period was mostly preferred for PA participation in Park B (62.8%) and in Park C (59.3%), but not for Park A (34.2%). Although for Park A, there was slightly more park users in the morning time period (36.6%) than in evening time (34.2%); for Park B and Park C, the morning time period (32.8% and 37.9%, respectively) was less frequently used time period. However, the noon and afternoon time periods were apparently the least preferred time periods for each park.

DISCUSSION

In this study, three different public parks by their location, size and facilities were systematically observed for acquiring the public park users' demographic variables and the public parks' contextual information. The general results indicated that there were differences in three public parks in terms of the parks users' demographic variables

including sex and PA preferences and of the public parks' contextual information including the day and time period preference for PA by the park visitors.

The general results indicated that the public park which is located in a more centralized location with a larger size and facilities was the most frequently used one. Among the other two suburban public parks, the number of park users in the medium size one was lower than those of the small size one. The medium size public park had poor PA facilities. Therefore, availability of PA facilities seems to be more important than the size of park. This result was consistent with a previous study (Kaczynski, Potwarka and Saelens, 2008). In this study, the authors reported the availability of park PA facilities as a good predictor of public park use for this purpose. Thus, it was reasonable to state that the public parks with good and/or structured facilities for PA participation should be needed for increasing PA participation.

The current results on the park users' sex showed that there was a slight difference between women and men park users for PA participation. More specifically, the small size suburban park with moderate facilities for PA participation was most frequently preferred by women park users. The controversial findings on the park users' sex existed in the literature. Although there has been a

number of studies indicating the higher percentage of men public parks users for PA as compared to their women counterparts (Floyd et al., 2008; Reed et al., 2008; Shores and West, 2008), some earlier studies (Brownson, Housemann, Brown, Jackson-Thompson, King, Malone and Sallis, 2000; Mowen, Graefe and Williams, 1998) and a more recent study (Reed, Morrison and Arant, 2009) have reported higher percent-tage of women than men using the parks for PA.

Although age groups were not significantly differed by the public parks, the total number of adult park users was higher in the current study. This result was consistent with the previous studies (Cohen et al., 2007; Shores and West, 2008). Most of these studies reported that mostly the adults were participating in PA in public parks.

Our findings indicated that the most frequently performed PA was the walking activity in the public parks. It might be due to the fact that there were no organized activities for park users and also no facilities for team sports, except for the Park C. There were more park users participating in walking activity in Park C. However, in Park A, there were more park users participating in vigorous PA. This result indicated that for the park users participating in vigorous activity, more structured facilities for PA was required. It was

consistent with the study investigating the positive effect of providing structural improvements including restoring walking path and other facilities on the use of the public parks for PA participation (Tester and Baker, 2009). Thus, it can be inferred that restructuring the public parks for better facilities for PA may be effective in promoting PA participation (Hoehner et, al., 2010). Because there were no organized activities and insufficient facilities for team sports, it can be recommended that there is a need to restructure the public parks for the promotion of PA participation.

It was found that both the week days and weekends were preferred for PA participation in this study. As the data collection was conducted in a summer period and the temperature was very high, the park users mainly preferred the morning and also evening time periods for PA participation. Floyd et al. (2008) was also reported a similar trend. In their study, most of the park users preferred the morning time period and most of them used the walking path.

In conclusion, this study revealed that PA characteristics of the park users and day and time period preferences of them for PA are changing by public parks location, size and facilities. This knowledge informs the park area planners, health promotion specialists, practitioners and the researchers to promote PA participation in the public

parks. Further studies should provide interventions for at-risk group including youth, older adults, girls, disabled people to promote PA participation in public parks (Librett, Henderson, Godbey and Morrow, 2007; Reed et al., 2008). Another type of intervention can be the provision of organized and/or supervised activities in the public parks, which might be resulted in the increase of PA participation (Cohen et al., 2007; Mc-Kenzie et al., 2006). Besides these kinds of interventions, park proximity, park amenities and safety issues were also important predictors for PA partici-pation in public parks (Cohen et al., 2007). It was reasonable to suggest that building public parks near to the households may also result in many of the people be more physically active. Overall, from these current results, it can be recommended that parks should be well-structured to meet the needs of parks user for PA participation.

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