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Artigos Originais
V. 12, N. 4 (2024) | ISSN 2317-434X

ASSOCIATION OF SOCIODEMOGRAPHIC FACTORS AND CARDIOVASCULAR RISK OF OUTDOOR GYM USERS: USE OF PUBLIC PARKS FOR HEALTH CARE

DOI: 10.16891/2317-434X.v12.e4.a2024.pp4708-4820 *Received in: 25.06.2024 | Accepted in: 21.11.2024*

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ABSTRACT

This study aimed to verify the association between sociodemographic and behavioral factors with cardiovascular risk (CR) in outdoor gym users. Sixty-nine volunteers were interviewed (27 men 50.3 ± 15.0 years old, and 42 women 46.2 ± 14.1 years old). A semi-structured form was applied to obtain sociodemographic information, lifestyle, and self-reported chronic non-communicable diseases (NCDs). To assess the CR for the practice of physical activity (PA), the Physical Activity Readiness Questionnaire (PAR-Q) was used. The results showed that 66.7% of the users were able (PAR-Q negative), and 33.3% required medical evaluation before performing PA (PAR-Q positive). For individuals aged below 50 years, there was less need for a medical evaluation before starting PA programs (OR = 12.1; $p<0.001$); however, individuals who reported having NCDs were more likely to need to see a doctor before starting PA programs (OR = 6.5; $p<0.001$). A higher prevalence of alcohol consumption was observed for individuals able to practice PA (OR= 4.0; $p<0.041$). Given the associations found, pre-assessment of CR and implementation of community programs of supervised exercise practice for user safety are recommended.

Keywords: Lifestyle; urban parks; resistance exercise.

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INTRODUCTION

The habit of frequenting natural environments such as ecological parks is associated with psychosocial improvements and increased levels of physical activity (PA) among the population, which helps to combat physical inactivity and sedentarism (COHEN *et al.*, 2012; OLIVEIRA *et al*., 2020). It is increasingly common in urban public spaces the implementation of outdoor gyms (OG); however, although they offer exercise options to increase PA practice among the population, little is known about their effects on the health and fitness of its users (COHEN *et al*., 2012). The OGs were first created for the use of the older population; however, several age groups have been using these spaces, which makes it important to list the characteristics of users to contribute to the implementation of public policies for better use of these facilities (IEPSEN; SILVA, 2015; SOUZA *et al*., 2014; IBIAPINA *et al*., 2017; BATTISTEL *et al.* 2021). The OG comprises gym equipment made of metal material of tubular format for performing cardiovascular and neurofunctional exercises that use body weight as the load; these facilities are installed in public squares and parks for the practice of PA free of charge for the community. The set of gymnastic equipment includes walking simulators, multi-exerciser, "skiing", seated rowing, "horseback riding", diagonal rotation apparatus, and one orientation sign (Guia de Academias ao ar livre, 2021).

These facilities can stimulate public park users to perform PA regularly, although their use pattern is still inconsistent (CRANNEY *et al*., 2016; SHARMA; CHAUDHARY, 2021). In an observational study that used filming to describe the patterns of use of this equipment, the results indicated that most users were older adults, preferred the morning period to perform exercises, almost 80% of the users used only three pieces of equipment present in the place, the average time of activity was around 9 minutes and had no professional supervision (CHOW *et al*., 2017).

For an exercise program to be effective for health, the variables frequency, intensity, duration, modality, volume, and progression should be controlled (GARBER *et al*., 2011). Intensity is considered an essential exercise variable to promote favorable adaptations in physical fitness or as a criterion for establishing limits with a lower risk of cardiovascular events (RIEBE *et al.*, 2015). A single session in OGs of combined circuit exercise performed at moderate intensity achieved international recommendations and guidelines for health attainment among the older population (CUNHA; GOMES; CARVALHO; DA SILVA, 2019). Although such results are promising, public park users may have different cardiovascular risk (CR) levels and fitness statuses (FECCHIO *et al*., 2014).

In Brazil, around 20% of the population is considered sedentary; this data is critical, given the risk it poses to the health of individuals (KNUTH et al., 2011). Sedentary behavior tends to develop cardiovascular events 2 hours after moderate exercise (BAPTISTA *et al*., 1999); therefore, unguided and inadequately performed PA may increase CR. Besides, most public spaces that stimulate the practice of PA do not offer equipment structure for evaluation or professional supervision, which does not allow the users' risk factors control (FORJAZ *et al*., 2002).

In this sense, screening methods for risk factor stratification are recommended for apparently healthy community populations or at low risk for cardiovascular events. The instrument Physical Activity Readiness Questionnaire (PAR-Q) has been widely used because it is considered a simple method for prior CR assessment and readiness for exertion in individuals who wish to increase their PA levels (WARBURTON *et al*., 2011a). Some studies conducted in Brazil proved the applicability of PAR-Q; Andreazzi, Takenaka, Da Silva, De Araújo (2016), evaluating individuals who started practicing PA in gyms, found that 20% of respondents answered "yes" to some of the questions with positive associations with medication use, family history, hypertension, and history of surgery. Also, Lage *et al.* (2020) examined the CR in women joggers and walkers and found that 32% were unfit and that individuals from higher age groups had more positive answers to PAR-Q.

The practice of PA in public spaces using OG equipment can be a fundamental strategy to increase the PA levels of the population, fight sedentarism, and prevent NCDs; however, until now, the literature lacks studies in Brazil that clarify the CR among OG users. Such results can provide scientific information for managers and multi-professional health teams to provide professional guidance in future interventions in different populations. This study can contribute to guiding public policies and health strategies, promoting access to physical activity practices for vulnerable populations and reducing the chances of chronic diseases. Therefore, the hypothesis of the study was that sociodemographic factors influence the practice of physical activity in OG. Thus, this study aimed to analyze the association of sociodemographic and

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behavioral factors with cardiovascular risk in ecological parks and OG users.

MATERIALS AND METHODS

Study area and participants

This study was approved by the Research Ethics Committee of the Federal University of Jataí, under opinion no. 1.641.233 and CAAE 55293516.6.0000.5083. The research was carried out in the municipality of Jataí, located in the southwest of Goiás, Brazil, with an estimated population of 105,729 inhabitants (IBGE, 2022). Data was collected in an ecological park called Diacuy, which was selected due to the large flow of users attracted by the large ecological area, equipped with sports courts and a walking track.

Volunteers/users of OGs from both sexes participated in the research. As inclusion criteria were adopted: individuals aged 18 or older that have used the installed OG equipment at least twice a week, with a minimum duration of 30 minutes per session in the last 60 days. The exclusion criteria were: having some self-declared physical or intellectual limitations or illiterate individuals.

Procedures

For the interviews, two researchers were trained to use the instruments, approach the volunteers, and clarify the bioethical principles during the interviews. The researchers were instructed to approach as many people as possible who were doing their exercise session using the OG. The volunteers who agreed to participate were asked to sign the free and informed consent form. Data collections were performed three times a week on alternate days (two weekdays and one day on Saturday or Sunday), in the morning (6:00 am to 9:00 am) and evening (6:00 pm to 8:00 pm) hours, during the months of March to May 2019.

Socio-demographic profile and OA utilization

A semi-structured questionnaire containing sociodemographic information was used for data collection; sex, age, ethnicity, education, marital status, and income. Behavior and lifestyle were questioned about health perception, smoking, alcohol consumption, use of continuous self-reported medication, and presence of NCDs (hypertension, cardiovascular diseases, and diabetes mellitus).

About OG use, information was collected on: frequency or weekly use, time preference/use (morning, evening, or night), time of OG visitation (in months), objective/motive for the practice of exercise in the OG, consultation of orientation signs, the performance of stretching before using the equipment, whether or not they monitored the exercises and how it was performed (time of execution; the number of sets and repetitions), perception of benefits and discomforts with the performance of exercises, total time of the OG sessions (hour/minutes), and opinion about the professional presence importance for on-site guidance.

Cardiovascular Risk (CR)

The Physical Activity Readiness Questionnaire (PAR-Q) was applied, consisting of the following seven questions: 1) Has your doctor ever said you have a heart problem and recommended that you only practice physical activity under a medical prescription?; 2) Do you feel pain in your chest when you practice physical activity?; 3) In the last month, have you felt chest pain while not practicing physical activity?; 4) Did you lose your balance due to dizziness or lose consciousness while practicing physical activity?; 5) Do you have any bone or joint problems that could be aggravated by physical activity?; 6) Your physician has recommended using medication to control your blood pressure or cardiovascular condition?; and 7) Do you know of any other physical reason preventing you from participating in physical activity?; the questionnaire is considered positive when the individual answers "Yes" to any of the seven questions. In this case, the individual is advised to seek medical advice before starting a PA program. If all answers are "No", the questionnaire is classified as negative, and the individual would be fit to start a PA program of moderate intensity up to 60% of maximal oxygen consumption (ACSM, 2014).

Statistical Analysis

Data were organized and tabulated to apply descriptive statistics (mean, standard deviation, absolute and relative frequency). The association of sex (male or female); age ($<$ or ≥ 50 years); education (elementary, high school, or higher); marital status (married or not married); the presence of NCDs (yes or no); alcohol consumption

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(yes or no); smoking (yes or no); frequency (≤ or > three times a week); time of practice (< or ≥ six months); duration (≤ or > 45 minutes); preferred PA shift (morning or afternoon/evening); the importance of the Physical Education professional monitoring OG (yes or no) with the result of PAR-Q (positive or negative) was verified through the construction of a 2x2 contingency table, in which the Fisher's Exact Test was applied. The Odds Ratio Test was used to verify the event occurrence possibility if the result was significant. The statistical analysis was performed by the BioEstat 5.3 program, adopting a significance level of $p<0.05$.

RESULTS

In total, 126 individuals exercising in the OG were approached. Of these, 45 women (35.7%) and 12 men (9.5%) did not meet the eligibility criteria or refused to participate in the research. Of the 45 women, 23 were younger than 18 years old, 12 used the equipment less than twice in the last two weeks, and ten gave up while applying the instruments, alleging a lack of time for continuity. Among the male population, nine refused participation, and three did not sign the free and informed consent. Therefore, the sample comprised 69 individuals, 27 males (39.1%) and 42 females (60.9%). The average age of OG users was 50.3 ± 15.0 and 46.2 ± 14.1 years for men and women, respectively, with predominantly brown skin, with high school level of education, married, and most abstained from informing their economic income (Table 1).

Table 1. Sociodemographic profile of OA users, Jataí, Goiás, Brazil.

Sociodemographic variables	N	%
Ethnicity		
White	27	34.7
Black	10	14.4
Brown	31	44.9
Asian	01	1.4
Education		
Elementary	15	21.7
High school	29	42
Superior	25	36.2
Civil Status		
Single	22	31.8
Married	37	53.6
Divorced	01	1.4
Widowed	09	13
Income/salary		
Up to 1 minimum wage	08	11.5
2	05	7.2
3	07	10.1

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>4	05	7.2
Not informed	44	63.7

Lifestyle habits related to health and the presence of NCDs can be seen in Table 2. Most individuals consider themselves healthy and do not smoke or consume alcoholic beverages; however, most claim to use continuous medication. Also, although most individuals did not have NCDs, some were hypertensive or had diabetes.

Table 2. Lifestyle habits, self-reported diseases, and cardiac risk stratification (PAR-Q) of OG users, Jataí, Goiás, Brazil.

Lifestyle habits	**Yes**	**%**	**No**	**%**
Considered healthy	65	94	04	5.7
Smoking	13	18	56	81.1
Use of alcohol	25	36	44	63.7
Use of medication	46	62	23	38
Presence of NCDs	**(N)**		**%**	
SAH	24		34.7	
CVD	01		1.4	
DM	06		8.6	
No	38		55	

*Legend: NCDs: Chronic Non-Communicable Diseases; SAH: Systemic Arterial Hypertension; CVD: Cardiovascular Diseases; DM: Diabetes Mellitus.

Source: Survey data, 2019.

About the OG pattern of use (Table 3), the majority use it three times a week, prefer the morning period, revealed that they have visited these spaces for over a year, and perform stretching in the LA equipment before starting the PA session. Their PA sessions are performed for 60 minutes, and health maintenance is the users' primary motivation. Most interviewees believe they know how to perform the exercises proposed on the OG equipment and monitor their exercises through time. All participants declared that they observed PA beneficial results, and most stated that the presence of a Physical Education professional would be important for a better practice.

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Table 3. OG's use pattern of ecological park users, Jataí, Goiás, Brazil.

Variables	N	%
Weekly frequency		
2 x	03	4.3
3 x	36	52.1
> 3 x	30	47.8
Time/use		
06 h to 09 h	62	89.8
18 h to 20 h	07	10.1
Visitation (months/years)		
< 3 months	10	14.4
3 months	13	18.8
6 months	16	23.1
> 1 year	30	43.4
Goal/Motivation		
Health	59	85.5
Medical recommendation	04	7.2
Weight reduction	06	8.6
Guidance (information plate)		
Yes	27	39.1
No	42	60.8
Stretching before		
Yes	38	55
No	27	39.1
Sometimes	04	5.7
Exercise monitoring		
Time	40	58.8
Repetitions	14	20.2
Pause	02	2.8
Does not monitor	13	18.8

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Benefit Perception		
Yes	69	100
Perception of Discomfort		
Yes	03	4.3
No	63	91.3
Sometimes	03	4.3
Total time for OG sessions		
30 min	16	23.1
45 min	10	14.4
60 min	32	46.3
> 60 min	11	15.9
Attendance/PM		
Yes	64	92.7
No	05	7.2

*Values expressed in absolute numbers and %. PM: professional monitoring.

Source: Survey data, 2019.

The PAR-Q evaluation verified that 66.7% of the participants (n = 46; 14 males and 32 females) presented negative PAR-Q (i.e., able to perform PA). The remaining 33.3% (n = 23; 13 males and 10 females) presented positive PAR-Q (i.e., medical consultation before starting a PA program needed).

Regarding the positive PAR-Q participants, 20 said "Yes" to only one of the questions (13 males and 7 females) and three women to two questions. Table 4 presents the response distribution of OG users for the PAR-Q questions.

Table 4. Detailed distribution of outdoor gym users' responses to the PAR-Q questions.

Questions	**All**				**Men**				**Women**			
	Yes		**No**		**Yes**		**No**		**Yes**		**No**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
1	0	0	69	100	0	0	27	100	0	0	42	100
2	0	0	69	100	0	0	27	100	0	0	42	100
3	0	0	69	100	0	0	27	100	0	0	42	100

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4	2	2.9	67	97.1	1	3.7	26	96.3	1	2.4	41	97.6
5	7	10.1	62	89.9	2	7.4	25	92.6	5	11.9	37	88.1
6	17	24.6	52	75.4	10	37.0	17	63.0	7	16.7	35	83.3
7	0	0	69	100	0	0	27	100	0	0	42	100

Source: Survey data, 2019.

Table 5 shows the association values of Fisher's exact test about PAR-Q and the sociodemographic variables, presence of diseases, and lifestyle of OG users. It was observed that individuals below 50 years old were 12.1 times less likely to answer "Yes" in PAR-Q questions. In addition, it was observed that individuals with NCDs are 6.5 times more likely to be PAR-Q positive. Regarding the habit of ingesting alcoholic beverages, it was verified that there is a four times higher prevalence of alcohol consumption among individuals with negative PAR-Q (fit for PA). About other factors such as sex, education, marital status, smoking, weekly frequency, session time, time of practice, and shift preference to perform PA, no associations with PAR-Q were observed (p>0.05).

Table 5. Association of PAR-Q classification (negative/positive) with sociodemographic variables, presence of NCDs, and lifestyle habits.

Variables	**PAR-Q responses**				**OR (CI 95%)**	***p***
	Negative		**Positive**			
	N	**%**	**N**	**%**		
Age						
<50 years old	33	71.7	4	17.4	12.1 (3.4-42.3)	<0.001
≥50 years	13	28.3	19	82.6		
Presence of NCDs						
Yes	14	30.4	17	73.9	6.5 (2.1-19.9)	<0.001
No	32	69.6	6	26.1		
Alcohol consumption						
Yes	21	45.7	4	17.4	4.0 (1.2-13.6)	0.032
No	25	54.3	19	82.6		

PAR-Q: Physical Activity Readiness Questionnaire; OR: Odds Ratio; CI: Confidence Interval; NCDs: Chronic Noncommunicable Diseases. *Fisher's exact test.

Source: Survey data, 2019.

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DISCUSSION

The OGs installed in public parks have been used by several age groups and sexes to increase their exercise sessions and PA levels (IEPSEN; SILVA, 2015; SOUZA *et al.*, 2014). These venues are accessible but without professional guidance, making it impossible to minimally assess the chronic health and CR conditions of PA outdoor practitioners (FORJAZ *et al.*, 2002). To optimize the use of these spaces and guarantee the safety of users, it is essential that guidance and supervision actions are implemented in the OG. Monitoring by professionals is fundamental for users' safety and continued adherence, especially among more vulnerable groups (JÉSSICA *et al.*, 2021).

The main findings pointed out that: 1) most users below 50 years old were ready to use OG; 2) the presence of NCD contributed to increased chances of medical referral before starting a PA program; and 3) a higher prevalence of alcohol consumption exists in the population ready to PA practice. This highlights the need for professional monitoring actions, especially for vulnerable groups, as adequate follow-up is essential to ensure the safety and sustainable engagement of users in exercise programs in OGs (BATTISTEL *et al.*, 2021).

Regarding the influence of age on exercise readiness in OG, Lage et al. (2020), evaluating women practicing recreational walking and running, concluded that younger age groups had a lower prevalence of negative answers in the PAR-Q questionnaire, similar to the results found in the present study. The age factor is considered a determinant in clarifying this result since most cardiovascular diseases are prevalent in individuals ≥ 60 years of age due to environmental factors and the biological maladaptation process of aging (COSTANTINO et al., 2016; NANAYAKKARA *et al.*, 2017; KANE; HOWLETT, 2018). According to PAR-Q, the average age of the investigated population was 48, an age group with lower susceptibility to symptoms and cardiovascular diseases and, consequently, lower chances of needing a medical referral. Moreover, the literature validates the PAR-Q for age groups between 15-69 years, i.e., the sample studied is within the age range of accuracy and sensitivity of the questionnaire, demonstrating the effectiveness of the instrument in identifying the health conditions of the target audience (FIROR; FALKNER,1988).

An association between NCD and positive PAR-Q was found, increasing by almost seven times the chances of the individual needing a medical evaluation before starting an exercise program at the OGs. Although the majority confirmed that they did not have NCDs, 34.7% reported hypertension, 8.7% reported diabetes, and 56% reported taking continuous medication. The results indicate that these public spaces require physical education professionals to monitor risk factors and implement specific interventions for each age profile of the population (LAGE *et al.*, 2020). Series and circuit exercises performed in OG were effective in reducing systolic and diastolic blood pressure, improving flexibility, cardiovascular capacity and quality of life indicators in middle-aged hypertensive patients (BARUKI; MONTEBELLO; PAZZIANOTTO-FORTI, 2022). In this sense, the presence of NCDs increases the chances of CR, being necessary to seek a medical examination and a more specific diagnosis to avoid cardiovascular events during practice (LEE *et al*., 2012). However, there should be caution with the interpretation of the association between NCDs and positive PAR-Q so that barriers such as unnecessary medical evaluations are not imposed and promote giving up PA practice for a population group that needs active lifestyle adoption to prevent disease progression (WARBURTON *et al*., 2011b).

Although most participants reported a healthy lifestyle, the chi-square test showed a positive association between PA-fit individuals and alcohol consumption. These results are considered adverse, as the literature points out that individuals with an active lifestyle tend to avoid harmful health risks (NIEMELÄ *et al*., 2022). Although these behaviors are incompatible (PA practice versus alcohol consumption), studies confirming these results were found by Ramírez-Góngora & Prieto-Alvarado (2016) identified a prevalence of alcohol consumption among street runners. This positive association may be linked to a "compensatory" behavior, i.e., individuals who consume alcohol tend to exercise to metabolize the calories accumulated and ingested by alcoholic beverages (ABRANTES *et al*., 2017). Also, according to Brennan and Giles (2014), adult populations who seek a healthy lifestyle proportionally perform PA to alcohol consumption, adopting healthy behaviors to reverse unhealthy behaviors.

This study has some limitations that should be considered. Firstly, the representativeness of the sample was compromised due to the inclusion criteria which selected more regular users, with a minimum attendance of twice a week and sessions of at least 30 minutes in the

last 60 days. This selection focused on individuals with greater engagement, which may limit the generalizability of the results to the entire population that attends OG. In addition, the data collection carried out at specific times (morning and evening) may have excluded people who use the park at other times, restricting sample diversity. Another limitation is the absence of physical tests that would allow a more in-depth assessment of users' fitness levels. Future studies could adopt models to monitor physical fitness and the positive impacts that professional accompaniment can offer practitioners during activities carried out in the OG. Despite these limitations, the results of this study highlight the need and interest of the population for more actions aimed at the community who frequent public parks, pointing to the importance of subsidies for the development of longitudinal studies that can more comprehensively capture the effect of practicing in these spaces over time.

CONCLUSION

This study showed that the population over 50 years and NCD carriers have higher cardiovascular risk and require prior medical consultation for self-monitored exercise programs performed in the OG installed in public parks. Also, the prevalence of alcohol consumption in individuals able to perform exercise requires attention to implement health education campaigns for populations practicing PA and drinking alcoholic beverages.

It is recommended that managers and health professionals integrate public parks into health promotion initiatives, carrying out cardiovascular risk screening and developing specific programs for groups at higher risk, such as the elderly and those with NCDs.

Future studies should investigate how educational level and nutritional status influence cardiovascular risk among OG users, as these factors can directly impact adherence to health practices and the development of cardiovascular diseases.

ACKNOWLEDGMENTS

The present work was carried out with scholarships from the National Council for Scientific and Technological Development.

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Artigos Originais
V. 12, N. 4 (2024) | ISSN 2317-434X

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