



Barriers for the use of outdoor gyms in adults and elderly from a southern city of Brazil

Barreiras para o uso de academias ao ar livre em adultos e idosos de uma cidade do Sul do Brasil

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ABSTRACT

The aim of this study was to identify barriers to use Outdoor Gyms (OGs) for physical activity (PA) practice and to examine their association with leisure-time PA, demographic and socioeconomic variables in adults and elderly. This cross-sectional population-based study enrolled 431 adults and elderly (66.8% women) aged 18 to 87 years living in the surroundings (up to 500 meters) of four OGs. Information about using OGs for PA practice, barriers to use OGs, leisure-time PA, demographic and socioeconomic variables were collected by domiciliary interview. Associations between barriers to use OGs with other included variables were analyzed using Chi-Square test. None barriers was reported for 29.2% (95%CI: 24.9-33.5) of the participants, being almost of then OGs' users. The most reported barriers to use OGs were lack of time (21.6%; 95%CI: 17.7-25.5), lack of interest (16.5%; 95%CI: 13.0-20.0) and laziness (10.7%; 95%CI: 7.8-13.6). Intrapersonal barriers were more often among men, interpersonal among women and environmental among those with less educational level ($p < 0.05$). In conclusion, OGs' users perceived fewer barriers than non-users, and most barriers to the use of OGs were intrapersonal with lack of time being the most prevalent.

Keywords: Fitness center; Physical activity; Barriers to access of health services; Cross-sectional studies.

RESUMO

O objetivo deste estudo foi identificar as barreiras para o uso de Academias ao Ar Livre (AAL) para a prática de Atividade Física (AF) e examinar sua associação com a AF no lazer, variáveis demográficas e socioeconômicas em adultos e idosos. Este estudo transversal de base populacional incluiu 431 adultos e idosos (66,8% mulheres) com idades entre 18 e 87 anos moradores do entorno (até 500 metros) de quatro AAL. Informações sobre o uso da AAL para prática de AF, barreiras para o uso de AAL, AF de lazer, variáveis demográficas e socioeconômicas foram coletadas por entrevista domiciliar. As associações entre barreiras para o uso de AAL com as demais variáveis foram analisadas pelo teste do Qui-quadrado. Não perceber barreiras foi relatada por 29,2% (IC95%: 24,9-33,5) dos participantes, sendo praticamente todos os usuários de AAL. As barreiras mais relatadas para o uso de AAL foram falta de tempo (21,6%; IC95%: 17,7-25,5), falta de interesse (16,5%; IC95%: 13,0-20,0) e preguiça (10,7%; IC95%: 7,8-13,6). As barreiras intrapessoais foram mais frequentes entre os homens, as interpessoais entre as mulheres e as ambientais entre aqueles com menor nível educacional ($p < 0,05$). Em conclusão, os usuários de AAL perceberam menos barreiras do que os não usuários, e a maioria das barreiras para o uso de AAL é intrapessoal, sendo a falta de tempo a mais prevalente.

Palavras-chave: Academias de ginástica; Atividade física; Barreiras ao acesso aos cuidados de saúde; Estudos transversais.

Introduction

Despite the association between regular physical activity (PA) and decreased risk of mortality from cardiovascular diseases, cancer, and all causes being well established¹, the prevalence of adults who do not achieve the recommendations of PA for health is still high². Regarding this framework, global strategies to increase populations' PA have been proposed³. Among the proposed strategies to decreasing barriers and scaling

up options to increasing PA levels, changes in the built environment have shown positive results⁴.

Parks, squares and others public spaces are examples of built environment that seem to play a key role for the PA promotion⁵. In recent years, gym equipment, known as Outdoor Gyms (OGs), have been installed in public spaces in different parts of the world as an alternative to increase the levels of PA of populations⁶. The provision of these structures in public spaces seems

to attract new visitors, stimulate increased levels of PA, and improve fitness and other health outcomes⁶⁻⁸.

Similarly to others countries, in Brazil the OGs were installed in several cities across the country⁹. These local actions are in line with National Policy of Health Promotion in Brazil, which has as one of its main priorities expanding PA practice opportunities for the population. The offer of OGs is an important public action to promote PA. However, the access and use of these facilities for the practice of PA may be related to a series of intrapersonal, interpersonal and environmental barriers and differ among demographic and socioeconomic subgroups^{10,11}. Still, barriers to use OGs seem different between users and non-users¹¹. Understand these barriers according these different populational subgroups are important to (re)plan actions aimed at increasing the number of users of OGs and maintenance of those already using these structures. Therefore, this study aimed to identify barriers to use OGs for PA practice and to examine their association with leisure-time PA, demographic and socioeconomic variables in adults and elderly.

Methods

This population-based cross-sectional study was conducted in a western city of Rio Grande do Sul State, Brazil with an estimated population of 125,435 inhabitants. Participants were adults (≥ 18 years old) residents of the surroundings (up to 500 meters) of four OGs distributed in different regions of the city. In the year which the study was carried out, there were eight OGs in the city. Four of them were intentionally selected considering different areas of the urban zone (west, east, south and central). Three OGs were located in squares with others options for leisure activities (west, east and south), and one of them was located in a large park with multiples possibilities for leisure activities (central).

The number of the required participants was calculated according the follow characteristics: a) population of 26,585 adults regarding the sum of the population where the selected OGs were located (west: 5,108; east: 1,672; south: 9,271; and, central: 10,474)¹²; b) 95% interval confidence (95% CI); c) acceptable sampling error of five percentage points; d) outcome prevalence of 50% (because this study was part of project with multiple outcomes); and; e) extra 10% to compensate possible losses and refusals. This calculation resulted in a required of 416 participants.

A multiphase probabilistic procedure was used to

select the participants. After choosing the four OGs, a buffer of 500 meters around of each of them was considered. The main entrance of the squares and of the park where the OGs were located was considered the initial/reference point. The closest residences to these points were the first selected residences and considered references for the selection of all others ones. For the residences up to 100 meters from the OGs the selection was performed alternating the inclusion of one residence and exclusion of the one immediately next. This procedure was repeated every 100 meters (100-200; 200-300; 300-400; and 400-500) from the reference residence to the OGs, with proportional increasing in the relation of included and excluded residences. That is, for the residences between 100 and 200 meters to the OGs after the included residence two residences were excluded; for those between 200 and 300 meters to the OGs after the included residence three residences were excluded; for those between 300 and 400 meters to the OGs after the included residence four residences were excluded; and, finally, for the residences between 400 and 500 meters to the OGs after the included residence five residences were excluded. If instead of some residence there was a residential building, the inclusion or exclusion of the apartments followed the procedure described above, respecting the proportion of included and excluded conform the distance between the residential building and the OGs. If, instead of some included residence there was a commercial establishment, automatically the next residence was selected.

All residents ≥ 18 years old of the included residences were invited to participate in the study. When in the moment of the visit there were no residents or the researchers were not attended, the residence was visited again up to two other occasions in different days and times. When there was some refusal to participate in the study, the residence immediately next was selected keeping the selection procedure for the next residences from this new situation.

Regarding the participants approach, visits to the selected residences were performed during week and weekends days between 02 pm to 08 pm. During the visits, the aims and procedures of the study were presented to the residents by the research team. The interviews were performed with residents who after the researchers' explanation accepted to participate in the study, signed the informed consent form and attended all eligibility criteria. Inclusion criteria were to reside around (up to 500 meters) one of the four selected

OGs and being 18 years of age or older. Not being able to perform any PA (self-reported by the participant) and having some cognitive limitation that did not allow answering the instrument's questions (cognitive limitation characterized by the indication of a relative, guardian or caregiver) were used as exclusion criteria. The interviews were carried out in the participants' own residence.

Barriers to use OGs for PA practice were the dependent variable of the study. It was assessed by the question: "What are the main factors that hinder or prevent you from using Outdoor Gym to practice physical activity?" Soon after the question, it was informed that they could report the number of factors that they considered barriers to use. There were no limits for barriers. However, they should indicate the most important. Barriers were considered in three different ways. First the number (absolute frequency) of reported barriers by each participant was identified. Second, considering only the barrier indicated as the most important, it was analyzed which were the reported barriers. The last way was performed considering the type of the reported barriers according the socio-ecological model. This model considers that the reported factors can be grouped on intrapersonal, interpersonal and environmental factors¹³.

PA, demographic and socioeconomic indicators were the independent variables. PA was assessed by the long version of the International Physical Activity Questionnaire (IPAQ)¹⁴, but only information from the leisure-time domain was used to describe the participants' PA levels. Participants were classified as sufficiently or insufficiently active according international recommendations¹⁵. Additionally, was asked for the participants if they usually attended the OG's facilities for PA practice. This was assessed by the question: "Do you use the equipment of the OG near your residence for the PA practice?" (yes or no). The demographic indicators considered in this study were gender (male and female) and three age groups (18 to 39 years old; 40 to 59 years old; and, 60 or more years old). As for socioeconomic indicators, we included self-reported monthly familiar income (up to two minimum wages; two to five minimum wages; and five or more minimum wages) and self-reported education level (up to eight years of study; nine to 11 years of study; and, 12 or more years of study).

Variables description was performed using absolute and relative frequencies and the respective 95% confi-

dence intervals (95%CI). Chi-Square test was used for associations between the barriers to use OGs and the independent variables. For the associations analysis in which the Chi-Square test identified statistical association ($p > 0.05$) and the independent variable had three or more categories (crosstabs larger than 2×2), the category with number of cases statistically higher than the others ones was identified by the value of the standard adjusted residual higher than two (2.0).

This research had its project reviewed and approved by the ethics committee on human research (protocol 1.694.104). Written informed consent was obtained for all participants. All interviews were performed on residence of the participants by an assessment team who had undergone training. The data collection occurred between September and October 2016.

Results

In 89 of the 549 visited residences surrounding the OGs, we did not find residents in the different attempts of contact. These cases were considered losses. In the 460 residences that the research team was received there were 42 refusals. Among the 418 residences that the researchers performed interviews, in 405 of them only one resident has participated in the study and in 13 of them two residents have answered the interview, totalizing 431 participants. Distribution of the participants was predominantly female (66.8%), 17.9% were 60 year or older, one fourth (25.3%) studied 13 or more years, and about half of the participants earned up to two minimum wages income (54.0%) and were sufficiently active (50.2%) - Table 1.

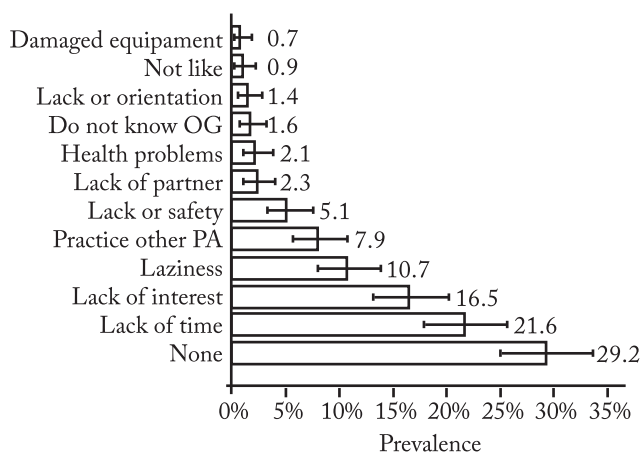
Of the total of participants, 69.8% (95%CI: 64.6-75.0) reported not using the OG's facilities for PA practice. Regarding the number of barriers to use OG, 29.2% (95%CI: 24.9-33.5), 64.5% (95%CI: 60.0-69.0), and 6.3% (95%CI: 4.0-8.6) reported none, one, and two barriers, respectively. Among those who reported none barriers to use OG, 97.6% (95%CI: 94.5-99.9) of them were OG users. Among those who reported at least one, were identified a total of 11 different barriers to use OG (Figure 1). The most prevalent of them were lack of time (21.6%; CI95%: 17.7-25.5), lack of interest (16.5%; CI95%: 13.0-20.0) and laziness (10.7%; CI95%: 7.8-13.6).

Reporting no barriers was associated to women and to physically active participants. Lack of time was more prevalent among men. Laziness was higher among those insufficiently active. Practicing other PA

Table 1 – Descriptive characteristics of the participants. Uruguai-ana, Rio Grande do Sul, 2016 (n = 431).

	n	%	95%CI
Gender (n = 431)			
Female	288	66.8	61.4-72.2
Male	143	33.2	25.5-40.9
Age group (n = 430)			
18 to 39 years old	192	44.7	37.7-51.7
40 to 59 years old	161	37.3	29.9-44.9
60 years or older	77	17.9	9.3-26.5
Education (n = 431)			
Up to 8 years	161	37.4	12.0-23.8
9 to 11 years	161	37.4	12.0-23.8
12 or more years	109	25.2	17.1-33.3
Familiar income (n = 430)			
Up to 2 minimum wages	232	54.0	47.6-60.4
2 to 5 minimum wages	109	25.3	17.1-33.5
5 or more minimum wages	89	20.7	12.3-29.1
Physical activity (n = 430)			
Insufficiently active	214	49.8	43.1-56.5
Sufficiently active	216	50.2	43.5-56.7

n = absolute number of participants; % = relative number of participants; 95%CI = 95% confidence interval.

**Figure 1** – Prevalence of perceived barriers to use Outdoor Gyms. Uruguai-ana, Rio Grande do Sul, 2016 (n = 431).

was associated to those who earned five or more minimum wages and who were sufficiently active. Lack of safety was associated to those up to eight years of study (Table 2).

Analyzing the barriers to use OGs according to the socio-ecological model, most of them were classified as intrapersonal (lack of time, lack of interest, laziness,

health problem, not known, not like), followed by environmental (lack of safety and damaged equipment) and interpersonal (lack of partner and lack of orientation) – Table 3. Intrapersonal barriers were associated to men and to those who studied 12 years or more. Interpersonal barriers were associated to women and who are insufficiently active. Environmental barriers were associated who studied up to nine years.

Discussion

The present study assessed barriers to use OG for PA practice and examined their association with PA, demographic and socioeconomic variables in adults. Results indicated that just under a third of participants reported no barriers, being almost all of them (97.6%) users of the OG. Among the 11 different reported barriers, most were intrapersonal, being lack of time, lack of interest and laziness those presenting higher prevalence.

The perception of “no barriers” to the use of OGs was reported almost exclusively by participants who reported being users of these facilities. Likewise, a study carried out in Australia indicated that elderly OGs users did not report barriers to the use of the facilities¹⁰. These findings are important because suggest that people who are already engaged in using the OGs tend to perceive less barriers to use these facilities than those who are not users. It is possible that physically active people perceive fewer barriers than those who are physically inactive, because this behavior already makes part of their daily routine. Actually, results of the present study also indicated that perception of “no barrier” to use OGs was more prevalent among those classified as sufficiently active. This is result is similar to those from studies examining barriers for PA practice, which found fewer barriers among people regularly engaged in PA than those who do not practice PA^{16,17}. In addition, reporting “no barriers” to use OGs was more frequent in women than in men. Although men are generally more physically active than women¹⁸, results from Brazilian studies indicate that women use more public PA programs than men^{19,20} and this evidence is confirmed in relation to the users of OGs^{9,20-22}.

Regarding the most reported barriers to use OG, our results are in line with previous Brazilian²³ and international¹⁷ studies that examined barriers for PA practice in different population subgroups. The lack of time, in general, is one of the main barriers to the practice of PA, including a recent study that examined barriers to use public PA programs in Brazil²⁴. Report-

Table 2 – Perceived barriers to use Outdoor Gyms according physical activity, demographic and socioeconomic variables. Uruguaiiana, Rio Grande do Sul, 2016 (n = 431).

Barriers	Gender (n = 431)		Age group (n = 430)			Education (n = 431)			Familiar income (n = 430)			PA (n = 430)			
	All	Female	Male	18-39y	40-59y	≥60y	Up to 8y	9-11y	≥12y	Up 2MW	3-4MW	≥5MW	IS	SA	
None	126	29.2	33.3*	21.0	29.7	31.1	24.7	24.8	35.4	26.6	32.8	23.9	25.8	24.8	33.3*
Lack of time	93	21.6	18.1	28.7*	24	23.0	13	21.7	20.5	22.9	18.5	23.9	27.0	23.4	19.9
Lack of interest	71	16.5	14.6	20.3	14.1	18.0	19.5	15.5	14.3	21.1	17.2	20.2	10.1	17.8	15.3
Laziness	46	10.7	11.8	8.4	13.5	8.1	9.1	10.6	9.9	11.9	12.1	8.3	10.1	14.0*	7.4
Practice other PA	34	7.9	6.6	10.5	7.8	5.0	14.3	6.8	6.2	11.9	6.0	4.6	16.9*	2.8	13*
Lack of safety	22	5.1	4.9	5.6	3.6	6.8	5.2	9.9*	2.5	1.8	4.3	8.3	3.4	5.1	5.1
Lack of partner	10	2.3	3.1	0.7	1.0	2.5	5.2	3.1	3.1	0.0	3.0	0.9	2.2	3.7	0.9
Health problem	9	2.1	2.4	1.4	0.5	1.9	6.5	3.1	2.5	0.0	2.6	1.8	1.1	3.3	0.9
Not know	7	1.6	1.0	2.8	2.6	1.2	0.0	0.6	2.5	1.8	1.3	2.8	1.1	1.4	1.9
Lack of Orientation	6	1.4	2.1	0.0	1.6	1.2	1.3	1.2	1.9	0.9	0.4	4.6	0.0	2.3	0.5
Not like	4	0.9	1.4	0.0	0.5	0.6	1.3	1.9	0.0	0.9	0.9	0.9	1.1	0.9	0.9
Damaged equipment	3	0.7	0.7	0.7	1.0	0.6	0.0	0.6	1.2	0.0	0.9	0.0	1.1	0.5	0.9

n = absolute number of participants; % = relative number of participants; y = years old (for age group's categories) and years of study (for education's categories); MW = minimum wage; IA = insufficiently active; SA = sufficiently active; PA = physical activity; * Statistically difference identified by standard adjusted residual value higher than 2.

Table 3 – Perceived barriers to use Outdoor Gyms according to socio-ecological model. Uruguaiiana, Rio Grande do Sul, 2016 (n = 431).

	Prevalence of perceived barriers			
	None (%)	Intrapersonal (%)	Interpersonal (%)	Environmental (%)
All (n = 431)	29.2	59.6	3.7	7.4
Gender (n = 431)				
Female	33.3*	54.9	5.2*	6.6
Male	21.0	69.2*	0.7	9.1
Age group (n = 430)				
18 to 39 years old	29.7	60.4	2.6	7.3
40 to 59 years old	31.1	56.5	3.7	8.7
60 years or older	24.7	63.6	6.5	5.2
Education (n = 431)				
Up to 8 years	24.8	59.6	4.3	11.2*
9 to 11 years	35.4	53.4	5.0	6.2
12 or more years	26.6*	68.8*	0.9	3.7
Familiar income (n = 430)				
Up to 2 minimum wages	32.8	57.3	3.4	6.5
2 to 4 minimum wages	23.9	59.6	5.5	11.0
5 or more minimum wages	25.8	66.3	2.2	5.6
Physical activity (n = 430)				
Insufficiently active	24.8	62.1	6.1*	7.0
Sufficiently active	33.3*	57.4	1.4	7.9

n = absolute number of participants; % = relative number of participants; * Statistically difference identified by standard adjusted residual value higher than 2.

ing this barrier is related to several other daily commitments, such as family issues, household chores, and a high workload²⁵. Together, these daily commitments may reflect in greater laziness and less interest for PA

practice in general and for the use of OGs in specific.

Results about the barriers to use OGs according to independent variables showed that the prevalence in reporting the lack of time was higher among men

than among women, confronting what was found in previous studies^{16,17}. On the other hand, Ferreira et al.²⁴ identified a lower prevalence of women than men reporting the lack of time as a barrier to participating in public PA programs. As was discussed above, the participation of women is greater than men in public PA programs^{19,21} and in the use of OGs for the PA practice^{9,20-22,26}. In addition, fewer women are inserted in the labor market than men in Brazil, spending more time at home involved with domestic responsibilities²⁷. This increased time at home might enable women to perceive the lack of time as a barrier to use OGs less often than men.

Laziness was a barrier more prevalent among insufficiently than those sufficiently active. People engaged in regular PA practice are more motivated than those who are not engaged²⁸, which may, in part, explains this finding. Practicing other PA was a barrier to use OGs and it was more reported among those from higher family income and those sufficiently active. This result may be because people with higher income have greater access to different options of PA than people with lower income. As for sufficiently active people compared to inactive people, the former group probably practices some PA of their preference more often than the latter group. Reporting lack of safety as a barrier to the use of OGs was more prevalent among participants who studied up to eight years. Although leisure-time PA is associated with people with a higher level of education²⁹, considering that OGs are free alternatives to practice PA, the use of these facilities may be greater among those with a lower level of education, which are probably also those with lower income. As the perception of lack of safety is frequent among OGs users, especially among those who use them at night²⁰, these characteristics may contribute to the understanding of the findings.

The results of this study regarding the reported barriers to use OGs according to the socio-ecological model indicated that most barriers were classified as intrapersonal. These corroborate with a recent systematic review of Brazilian studies about barriers to PA practice²³ and with the results of a study about barriers for users to participate in PA programs³⁰. In addition, an important result regarding the associations between interpersonal barriers and the independent variables analyzed was found. Lack of partner and lack of orientation were not associated to any of the analyzed independent variables. However, when they were grouped as interpersonal barriers, the two variables were more

strongly associated with women. This result suggests that social aspects, such as having a partner and orientation were characteristics that influenced more women than men to use of OGs for PA practice.

Considering that intrapersonal were the most reported barriers, promoting the use of OGs should consider individual aspects. The lack of time as the main reported barrier to the use these facilities must be understood as a barrier influenced by a number of other individual aspects and also by social and environmental aspects²⁸. Thus, strategies to increase the use of OGs by the population should be composed by characteristics that contribute for these facilities being more attractive. Lack of safety was one of reported barriers and this is increased at night²¹, period of the day who most of the people have free time and, consequently, can choose to use it in order to practice some PA. Thus, ensuring that squares and parks where the OGs are installed are illuminated at night and that these places and their surroundings are safe should be priorities of the public administration. Although lack of orientation and damaged equipment have being barriers, few participants reported these factors in this study; on the other hand, keeping equipment in proper conditions for use and providing professional instruction are facilitators for the use of OGs^{10,11,26}. Together, these characteristics may become OGs more attractive, increasing the population's interest in the use of these structures and contributing to the reduction of individual barriers to the use of OGs. These strategies, in addition to increasing the number of users of OGs, may help those who are already users to stay motivated and continue to use these structures.

Besides the results previously discussed, other strengths of the study should be highlighted. To our knowledge, this is the first Brazilian population-based study to examine barriers to use OGs in adults. Others studies already have investigated this theme, yet they were carried out enrolling only older adults OGs users^{10,26} and park users¹¹. Thus, the findings of this study contribute to the better understanding about the barriers to the use of OGs between users and non-users of these facilities from different demographic and socioeconomic subgroups, and among those who meet and do not meet PA recommendations. Furthermore, the selection procedure and the number of participants are characteristics that give the sample representativeness and power for analyzes, increasing the internal validity of the study. However, some limitations should be

considered to a proper understanding and generalization of the results. The five-percent point error used to calculate the sample size increases the chance of type 2 error. Although the measures for barriers to use OGs for PA practice were carried out based on questions similar to those used in previous studies¹¹, psychometric indicators of these measures were not performed. Interviews were performed in spring when the daily average temperature increases compared to winter and this may influence the perception of the barriers to use OGs. Previous studies indicated weather as an important barrier to use OGs^{11,26}, and this was not reported in the present study. As this is a cross-sectional study, it is not possible to attribute cause and effect relationships to the results of this study on the associations between the different barriers to use OGs and the analyzed independent variables.

Findings of this study provide important information regarding practical applications. Firstly, about 30% of the participants reported to use OGs for PA practice and almost all of them reported “no barriers” for using these facilities. These findings suggest that people who are already users of OGs perceive fewer barriers to use them than those who are not users, suggesting that users of OGs may continue to use these facilities over time and, consequently, remain physically active. Regarding the reported barriers, most of them were intrapersonal, with lack of time and lack of interest being the main ones. Intrapersonal barriers are more often among men, interpersonal among women, and environmental among those with less educational level. Findings of this study contribute to a better understanding about barriers for the use of OGs and indicate that these facilities installed in squares and parks may be an important alternative for the population to practice PA.

Conflict of interest

The authors declare no conflict of interest.

Author's contributions

Bergmann GG, participated in all stages of the study. Streb AR, participated in the collection and analysis of data, contributed in the writing of the manuscript and critical review of the content. Ferrari M, Alves DCC and Soares BAC, participated in the collection and analysis of data and performed the critical review of the content. Ferreira GD, and Pinheiro ES, contributed to the writing of the manuscript and critical review of the content. All authors approved the final version of the manuscript.

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