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IS THE BODY COMPOSITION OF OBESE WORKERS ASSOCIATED WITH THE CONSTRAINTS TO PHYSICAL ACTIVITY LEISURE?[1]

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Rubian Diego Andrade[2]
Universidade Federal de Juiz de Fora – Campus Governador Valadares (UFJF-GV)
Governador Valadares – MG – Brasil
https://orcid.org/0000-0003-0338-230X

Amanda da Silva Bergmann
Instituto de Ensino Superior da Grande Florianópolis (IESGF)
São José – SC – Brasil
https://orcid.org/0009-0001-4656-8094

Poliana Piovezana dos Santos
Universidade do Estado de Santa Catarina (UDESC)
Florianópolis – SC – Brasil
https://orcid.org/0000-0002-2910-1150

Sabrina Fernandes de Azevedo
Universidade do Estado de Santa Catarina (UDESC)
Florianópolis – SC – Brasil
https://orcid.org/0000-0002-6782-2151

Juliana de Paula Figueiredo
Universidade do Estado de Santa Catarina (UDESC)
Florianópolis – SC – Brasil
https://orcid.org/0000-0001-8477-465X

Érico Pereira Gomes Felden
Universidade do Estado de Santa Catarina (UDESC)
Florianópolis – SC – Brasil
https://orcid.org/0000-0002-6924-122X

IS THE BODY COMPOSITION OF OBESE WORKERS ASSOCIATED WITH THE CONSTRAINTS TO PHYSICAL ACTIVITY LEISURE?

ABSTRACT: The aim of this study was to associate the perception of barriers to leisure-time physical activity (LPA) with the industrial worker's weight status. 885 workers of both sexes (515 women) participated. In addition to barriers to LPA, self-

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[2] LEL - Laboratório de Estudos do Lazer/GERE/UFU- Uberlândia-MG; GEPLAVS – Grupo de Extensão e Pesquisa em Lazer, Aventura e Sustentabilidade/UFJF-GV.

reported BMI and sociodemographic variables were analyzed. Stratified by weight status, reasons such as lack of interest in practicing ($p = 0.004$), lack of physical skills ($p = 0.044$), concern with appearance during practice ($p < 0.001$) and fear of injury ($p = 0.002$) were significantly more frequent among obese compared to eutrophic individuals. Also, the higher the BMI of women, the more barriers to LPA are perceived ($r = 0.119$; $p = 0.009$). Is the body composition of obese workers associated with the constraints to physical activity leisure? Furthermore, in women, the impact of the relationship between perceived barriers and weight status appears to be greater.

KEYWORDS: Leisure activities. Body composition. Occupational health services.

A COMPOSIÇÃO CORPORAL DE TRABALHADORES OBESOS ESTÁ ASSOCIADA ÀS BARREIRAS PARA A ATIVIDADE FÍSICA NO LAZER?

RESUMO: O objetivo deste estudo foi associar a percepção de barreiras para atividade física no lazer (AFL) com o *status* de peso de trabalhadores industriários. Participaram 885 trabalhadores de ambos os sexos (515 mulheres). Além das barreiras à AFL, foram analisados o IMC auto referido e variáveis sociodemográficas. Estratificadas pelo *status* de peso, motivos como falta de interesse em praticar ($p = 0,004$), falta de habilidades físicas ($p = 0,044$), preocupação com a aparência durante a prática ($p < 0,001$) e medo de lesionar-se ($p = 0,002$) foram significantemente mais frequentes entre os obesos, em comparação aos eutróficos. Ainda, quanto maior o IMC de mulheres, mais barreiras para AFL são percebidas ($r = 0,119$; $p = 0,009$). Concluiu-se que a composição corporal é um fator que está associado às AFL de trabalhadores obesos. Além disso, em mulheres, o impacto da relação entre a percepção de barreiras e o *status* de peso parece maior.

PALAVRAS-CHAVE: Atividades de lazer. Composição corporal. Serviços de saúde do trabalhador.

Introduction

Regular exercising is recognized as a key element for promoting health and quality of life (NAHAS *et al*., 2010). In this regard, scientific literature has highlighted several associated benefits, such as: reducing the risk of heart disease, depression, stroke, hypertension, diabetes and cancer. Physically active individuals have reduced stress and anxiety levels, better social interaction and disposition (CHU *et al.,* 2019; BRASIL, 2021), in addition to a proven reduction in body composition (VIEIRA *et al.,* 2016).

The classic concept of physical activity was developed by Caspersen *et al.* (1985) in which he says it is any body movement produced by skeletal muscles, which

results in energy expenditure greater than resting levels in different areas such as: free time, commuting, work or study and domestic tasks. Recently, the Brazilian Guide to Physical Activity for the Brazilian Population expanded this concept, bringing into discussion aspects related to the voluntary movement of the body above the resting level, promoting social and environmental interactions (BRASIL, 2021).

In this way, it is understood that physical activities in leisure time are incorporated into an expanded construct, leisure, which incorporates bodily practices in "free time", a human need and dimension of culture, manifested through its nuances, such as subjectivity, time, space and attitudes (GOMES, 2014). However, involvement in leisure-time physical activities can be influenced by the perception of barriers to practice. Lack of motivation, lack of time, lack of money, feeling tired and unfavorable weather are some of the most prevalent barriers reported by the population to practicing physical activity during leisure time (SILVA *et al*., 2011). In developed countries, lack of time is described as a very significant barrier. On the other hand, financial difficulties are little reported. In developing countries, with opposite realities, working hours and excessive domestic tasks are often presented as limitations as factors that reflect on low levels of physical activity (ANDRADE *et al.,* 2019).

In this regard, the relationship between barriers to leisure-time physical activity and sociodemographic characteristics may vary according to different contexts and populations. Some studies, however, have explored this relationship and identified some trends. For example, personal characteristics appear to be important determinants of health behaviors, however, multidimensional approaches that consider social and physical environments should be used to obtain a broader view of the context. In relation to personal characteristics, gender, education, skin color and age have a significant effect on the practice of physical activity during leisure time. Of the

environmental and social variables among adults, lack of security, money, time and insufficient facilities have a significant effect on leisure-time physical activity (VIEIRA; DA SILVA, 2019).

In light of this discussion, the prevalence of obese people in the world has been growing in recent years. A study carried out with data from 195 countries over 25 years reveals that, in 2015, the number of obese adults reached 603.7 million. Furthermore, since 1980, the prevalence of obesity has doubled in more than 70 countries and has increased steadily in most other countries (THE GBD..., 2017). Therefore, in the discussion about the inclusion of obese people in the LPA, issues related to appearance and self-perception of body image gain strength and can also be considered. In a study of 2,298 Australian adults, Ball, Crawford e Owen (2000) concluded that feeling too fat to exercise is a common barrier among obese people, especially women. McIntosh, Hunter e Royce (2016), in turn, emphasize the importance of treating each person as an individual and identifying perceived barriers, whether physical, psychological or social, in order to provide targeted support to overcome them.

Therefore, understanding the factors that make it difficult for obese people to participate in leisure-time physical activity programs seems to be a challenge to be overcome. Brazil faces a significant increase in overweight and obese people, and, according to the Food and Agriculture Organization of the United Nations, more than half of the Brazilian population is overweight and obesity already affects 20% of adults (FAO, 2017) Corroborating this information, more current data denote the continuous increase in the number of adults over 20 years of age who are overweight and obese, also showing that the obesity rate among women was rising to the detriment of men, reaching 30.2% among those surveyed (IBGE, 2020).

In addition, analyzes of negative outcomes associated with obesity in the labor market are frequent. Decreased quality of life, disability, decreased productivity in the workplace, may be associated with excess weight, which leads to increased costs for the market and society (ABDIN *et al*., 2018).

However, there are few studies that have investigated the association of the weight status variable with the perception of barriers to leisure-time physical activity (HÖFELMANN; BLANK, 2009; NASCIMENTO *et al*., 2017) especially in the Brazilian context. Therefore, the objective of this study was to associate the perception of barriers to leisure-time physical activity (LPA) with the weight status of industrial workers.

Methods

The present study is characterized as being descriptive, exploratory and cross-sectional in nature (GIL, 2010). The same was carried out in a Brazilian communications and technology industry company, located in the state of Santa Catarina, in a metropolitan city. For the sample calculation, a tolerable sampling error of 4% was considered, for a population of 1674 industrial workers (of these 720 worked in production and 954 in administrative sectors) and with a confidence level of 95%, resulting in a minimum sample of 443 subjects (RODRIGUES, 2002). However, the final sample included a total of 885 workers (515 women), with an average age of 31.1 years old (16-60 years old).

Industrial workers were invited to participate in the research through collective internal communication, thus, all workers had the same opportunity to participate. Participants signed the Free and Informed Consent Form (FICF) agreeing to participate voluntarily and anonymously in the research. This study was approved by the Human

Research Ethics Committee of the University of Santa Catarina, on 09/22/2014, under opinion No. 801,409, in accordance with resolution 466/12 of the National Health Council.

The instrument used was a questionnaire constructed and validated by Martins and Petroski (2000), composed of 19 questions that have alternatives such as “always”, “almost always”, “sometimes”, “rarely” and “never”. In order to reveal the perception of physical activity restrictions during leisure time, the answers “almost always” and “always” were considered barriers observed (DAMBROS; LOPES e SANTOS, 2011). The process of constructing and validating the instrument recruited the same sample as the present research (adults) and presented satisfactory psychometric reproducibility indices, both in the application of the pilot study (r = 0.980) and in its final version (0.860) (MARTINS; PETROSKI, 2000). Workers also answered sociodemographic questions (age, gender, marital status and education).

The dependent variable, weight status, was categorized based on the calculation of BMI (Body Mass Index) obtained from self-reported data, with cutoff points suggested by the World Health Organization (WHO, 2010): eutrophic (underweight and underweight normal - BMI ≤ 24.9 kg / m²); overweight (BMI ≤ 25.0 kg/m²; BMI > 30.0 kg/m²); and obesity (BMI ≥ 30.0 kg/m²). Although it is understood that overweight people have an increased health risk, for statistical purposes, and, in order to understand more clearly the issues related to the object of the study (barriers) to the obese population, this group was isolated from the rest of the sample. Thus, the weight status variable was analyzed in two categories (group 1 = eutrophic and overweight; group 2 = obese).

The data were tabulated and analyzed using *software SPSS* version 20.0. The Kolmogorov Smirnov test confirmed the non-parametric distribution of the data. To

analyze the information, descriptive statistics were performed using mean, standard deviation and frequency distribution. The Chi-square test was used to identify differences and associations between categorical variables. The Spearman test was used to identify the correlation between the variables, BMI and number of perceived barriers. For all analyses, a significance level of 95% and $p<0.05$ were considered.

Results

The final sample consisted of 885 workers aged 31.1±8.49 years, 58.2% of whom were female. Regarding income, 841 workers had an average salary of approximately BRL 2,124.57. As for BMI, the average was 25.17 kg/m^2, which indicates overweight according to the World Health Organization classification (WHO, 2010). Table 1 presents the general characteristics of the sample, according to gender, marital status, education, body mass, height, BMI and weight status.

Table 1: General characteristics of the sample.

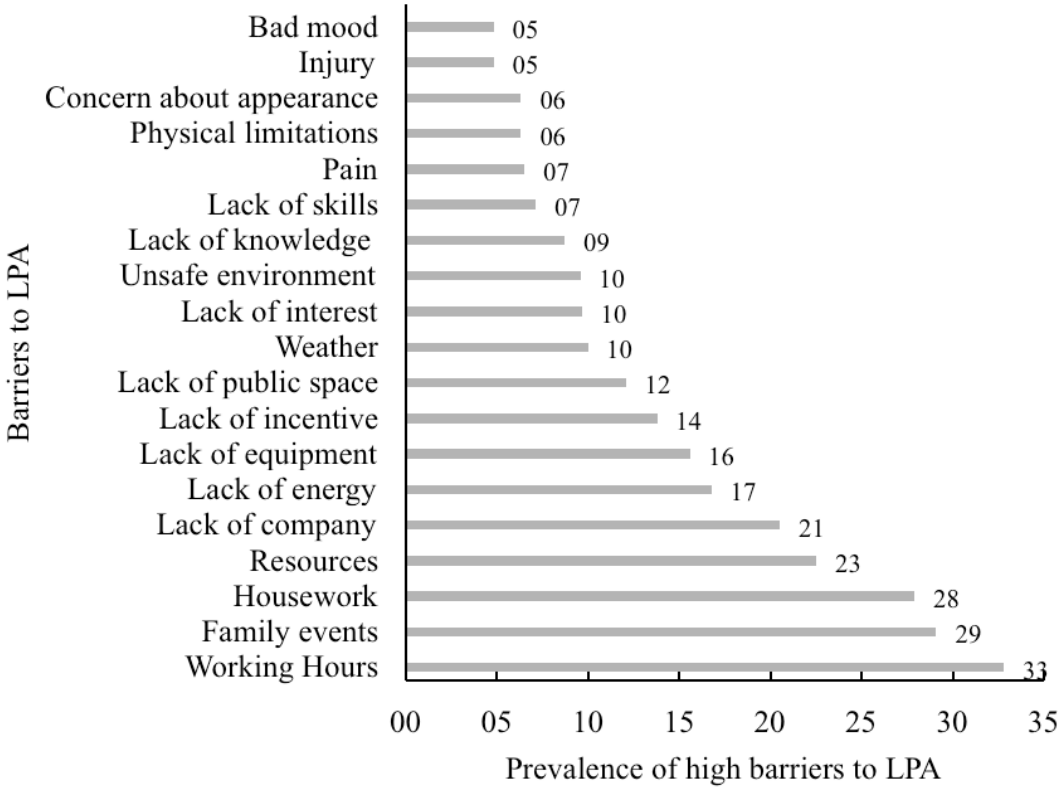
Variables	**n**	**Indicators (%)**
Gender, %		
Male	370	41.8
Female	515	58.2
Marital status, %		
Has a partner	604	68.2
Does not have a partner	281	31.8
Education, %		
Elementary School / High School	598	67.6
Higher Education / Postgraduate	287	32.4
Body mass, kg(DP)	880	71.32 (15.22)
Height, m(DP)	881	1.67 (0.95)
BMI, Kg/m^2(DP)	879	25.17 (4.30)
Weight status, %		

Eutrophic / Overweight	766	88.20
Obese	102	11.80

Legend: n= number of cases SD= standard deviation

Based on the analysis of perceived barriers to leisure-time physical activity, considering the total sample (885 workers), the most frequent restrictions were "long working hours" (32.8%), "family commitments" (29.1%) and "household tasks" (27.9%). The least frequent barriers were "bad mood" and "injury" (4.8%) as shown in Figure 1.

Figure 1: Prevalence of high perception of barriers to LPA



Legend: LPA = leisure-time physical activity

When the barriers were stratified by weight status (underweight and eutrophic and overweight; and obese), it was clear that of the 19 barriers, 14 were, in absolute values, more prevalent in obese people. However, when carrying out the statistical test for the association of barriers with weight status, reasons such as "lack of interest in

practicing", "lack of physical skills", "concern with appearance during practice" and "fear of getting injured " were significantly more frequent among overweight workers ($p<0.05$) (Table 2).

Table 2: Association between barriers to LPA and weight status.

Barriers to LPA	**Eutrophic and overweight**	**Obese**	**p-value**
Long working hours	33.2	30.3	0.570
Family events	29.1	29.0	0.995
Housework	27.0	34.3	0.125
Lack of financial resources	22.1	25.0	0.517
Lack of energy	16.0	23.0	0.077
Lack of company	20.4	20.2	0.963
Lack of suitable climate	9.5	14.1	0.148
Lack of interest in practicing	8.8	18.0	**0.004**
Lack of space available for practice	12.2	12.1	0.975
Lack of available equipment	15.6	14.0	0.670
Lack of encouragement from family and/or friends	13.6	14.1	0.891
Lack of physical skills	6.5	12.0	**0.044**
Insufficiently safe environment	10.1	8.1	0.535
Bad mood	4.4	6.0	0.482
Mild pain or discomfort	6.6	7.2	0.817
Lack of knowledge or guidance about physical activity	8.2	13.1	0.101
Physical limitations	5.9	10.1	0.107
Concern about appearance during practice	5.1	15.0	**<0.001**
Fear of getting injured	4.0	11.1	**0.002**

Although the correction analysis between the number of perceived restrictions and BMI did not present significant values, considering the total sample ($r=0.048$;

p=0.116), when stratified by gender, the data reveal a weak but significant correlation (r= 0.119; p=0.009) among women. Thus, restrictions on the practice of physical activity in female workers become more latent and numerous as they age. Among men, this association was not significant (r=0.062; p=0.244).

Discussion

The present study aimed to associate the perception of barriers to leisure-time physical activity (LPA) with the weight status of industrial workers. The results identified in the study corroborate the theory of leisure restrictions defended by Crawford and Godbey (1987). In it, the authors overcome the idea of barriers (as something insurmountable) and understand them as restrictions, which can, in some way, be overcome. For the authors, restrictions are classified into three types: a) intrapersonal restrictions; b) interpersonal restrictions; and c) environmental restrictions. According to the hierarchical model constructed from this classification (CRAWFORD; JACKSON; GODBEY, 1991), the involvement and overcoming of restrictions on leisure necessarily involve, at first, negotiation mechanisms to overcome intrapersonal restrictions, which have greater "power of inertia". When overcome, they form preferences through the negotiation process of interpersonal relationships. While ultimately environmental restrictions determine whether or not to participate in leisure activities. However, it should not be stated that the environment is less important, but rather that the focus to activate coping mechanisms must be focused on the individual (ANDRADE; FELDEN, 2021).

In the meantime, all the statistically most prevalent restrictions/barriers in the sample of obese workers analyzed are intrapersonal restrictions, that is, they all concern negative psychological states and/or characteristics of the individual. They are: "lack of

interest in practicing", "lack of physical skills", "concern about appearance during practice" and "fear of getting injured". Despite being intrapersonal restrictions, overcoming these factors alone is extremely difficult, often requiring the collaboration of specific professional knowledge that is external to the individual (MATSUDO; MATSUDO, 2006).

On the other hand, the working day itself often encourages behaviors that favor the maintenance of an unhealthy lifestyle, for example, high levels of stress, inadequate nutrition, prolonged sedentary behavior, among others (FIGUEIREDO; MONT'ALVÃO, 2008). In this context, the workplace takes on an extremely important role and can be a strategic agent to enhance significant changes in habits to be considered in a primary health promotion intervention that favors the maintenance of a healthy weight (HÖFELMANN; BLANK, 2009).

In order to reduce the aggressive impact of work on the health of their employees, many companies have adopted as a strategy the promotion of health and quality of life programs with an emphasis on physical activity, such as the implementation of workplace gymnastics and ergonomics programs, seeking promote humanized treatment in the corporate environment (FIGUEIREDO; MONT'ALVÃO, 2008). In a recent systematic review study, the effectiveness of workplace well-being programs based on physical activities for improving health and productivity at work was demonstrated (MARIN-FARRONA *et al*., 2023). On the other hand, in another, it concluded that in terms of reducing obesity in workers, institutional programs must take into account a multidisciplinary approach, associating physical activity with the promotion of a healthy lifestyle, mental health care and well-being with a focus on behavioral changes seem to be more effective in reducing the body composition of workers in institutional programs (JIMÉNEZ-MÉRIDA *et al*., 2023).

In Brazil, one can cite as a success story: the Lazer Ativo [Active Leisure] program, promoted by SESI-SC (Social Service of Industry of the State of Santa Catarina). The program initially aimed to profile the lifestyle of industrial workers in Santa Catarina, but was soon better structured with theoretical bases and methodological procedures and thus widely disseminated to other regions in the country. Based on a lifestyle assessment and promotion model called Pentacle of Well-being, the focus of the program's actions were the following variables: healthy eating, physical activity, stress control, relationships and preventive behavior (NAHAS *et al*. 2010). In this regard, the relevance of implementations by institutions, whether public, private or third sector, in the implementation and maintenance of programs aimed at worker health and well-being is confirmed.

However, it is questioned how effective physical activity interventions are within the corporate universe. In this regard, a series of research has been carried out in recent years. Dishman *et al*., (1998) for example, published a meta-analysis at the end of the 1990s in which physical activity interventions in the workplace were not identified as being substantially significant for increasing levels of leisure-time activity and physical fitness in people. workers. The authors justify that the lack of methodological rigor of the interventions may have influenced the results. Engbers *et al.* (2005) , in turn, identified positive interventions in changing behaviors related to food intake. However, the effect of interventions with physical activities in the workplace was modest. At the end of the 2000s, Conn *et al.,* (2009) identified that interventions of this nature can have positive effects on parameters related to leisure-time physical activity, physical conditioning, metabolic variables, anthropometric measurements and variables related to work. such as attendance and stress. The authors suggest, however, the development of research with high methodological quality that can answer questions

about comparisons between programs that allow employees to participate in physical activities during paid working hours and those that do not, and interventions in places with and without facilities physical in the workplace.

Even with little evidence in this regard, there are already a series of recommendations on these issues. For example, the United Nations (WORLD..., 2020) recently also published a series of success stories carried out in Europe. Some of the suggestions of UN for organizations to promote the practice of physical activity in their workers' leisure time include: a) facilitating access or allowing activities in and around workplaces; b) the construction or maintenance of spaces in which people can be active, including recreational facilities and green spaces; c) if it is not possible to build leisure spaces, encourage and/or mediate the use of public spaces as a way of facilitating access to existing structures; d) encourage the use of new technologies such as pedometers or cell phone devices to monitor physical activity levels, increasing motivation to be physically active during leisure time; e) provide support from health professionals for adherence to programs; and f) involve employees in planning interventions so that their specific needs are met.

From this perspective, the European Network for Workplace Health Promotion in the document known as the Luxembourg Declaration on the Promotion of Health at Work in the European Union (WORKPLACE..., 2007), and, in other documents of the organization (EUROPEAN..., 2013), recommends a set of criteria for promoting physical activity in the workplace, such as implementing approaches that encourage physical activity during working hours, weekends and off-duty hours, as well as providing facilities and programs for physical activity that is easily accessible in the workplace or at least in external sports facilities.

For these reasons, it is plausible and necessary to expand the discussion on the inclusion of Physical Education Professionals within the teams of Specialized Services in Occupational Safety and Medicine (SESMT). Such professionals, together with the other members, Occupational Physician, Occupational Engineer, Occupational Safety Nurse, Occupational Safety Technician and Occupational Nursing Assistant (BRASIL, 1990), could contribute to the planning, organization, execution and evaluation of more assertive health promotion program regarding the practice of physical activity and health of obese and/or eutrophic workers in the corporate environment, considering that there is already evidence of the effectiveness of interventions with a physical education professional in guiding and prescribing activity leisure physical activity in workers using different strategies such as group or individualized care or resources such as in-person activities or the use of technology (GAWLIK *et al.,* 2023).

Finally, another result that should be highlighted was the positive and significant correlation between the number of perceived barriers and BMI associated with females. This fact is possibly due to sociocultural aspects, in which the female body suffers over time. It is worth to emphasize, however, that IBGE data warn of the continuous increase in overweight and obesity among Brazilian adult women (IBGE, 2019), which could be an even greater aggravating factor when related to the findings of the present study, and could intensify the barriers to leisure-time physical activities among this population

Even though some discussions have been presented and dialogues about paradigms of deconstruction of the stereotype standard have gradually been broken, it is clear that the burden attributed to the aesthetic standard of the female body is still very strong (MEDEIROS *et al.,* 2022), which has repercussions on women's health. Thus, according to the data presented in the present study, being a fat woman becomes an

agent that makes it difficult to participate in and engage in physical activities during leisure time.

As limitations of this research, the sample selection can be considered intentionally, including only one company in the region, which suggests caution when extrapolating data. Furthermore, the measurement of variables indirectly and self-reported, especially body mass and height, used to calculate BMI and subsequent classification of weight status, may have some measurement bias. It is suggested that future research carry out direct and gold standard assessment procedures, in order to overcome this possible bias. In addition, an individual analysis with the sample could better answer how the composition, in fact, compromises the performance of leisure-time physical activities for obese people. Despite the aforementioned limitations, this paper, with its expressive sample and revealing results, can contribute to the deconstruction of prejudices that are already so deeply rooted in society (they are often reproduced in the corporate environment), making access to LPA more inclusive and democratic.

Final Considerations

With the results of the inferential analyzes presented in the present study, it can be concluded that the body composition of obese industrial workers is associated with barriers/restrictions to the practice of physical activity during leisure time. Furthermore, in female workers this process is more impacted as the BMI is higher. Therefore, it is suggested that corporate environments can develop policies and programs aimed at meeting the needs of obese individuals, promoting mechanisms and strategies to overcome barriers, in order to minimize the impacts of barriers/restrictions on leisure-time physical activity.

Bearing in mind that leisure, and, consequently, physical activities during leisure time, are configured as a social right, provided in the 1988 Federal Constitution (BRASIL, 1988), these must be promoted whether by the public or private sector. In the meantime, the promotion and maintenance of workers' health and quality of life must be focused more closely on different areas of knowledge, in a multidisciplinary perspective, in different times and spaces of companies and industries.

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Endereço dos(as) Autores(as):

Rubian Diego Andrade
Endereço eletrônico: rubian.andrade@ufjf.br

Amanda da Silva Bergmann
Endereço eletrônico: amandabergmann2@hotmail.com

Poliana Piovezana dos Santos
Endereço eletrônico: poliana.piovezana@gmail.com

Sabrina Fernandes de Azevedo
Endereço eletrônico: saedfisica@gmail.com

Juliana de Paula Figueiredo
Endereço eletrônico: juliana.figueiredo@udesc.br

Érico Pereira Gomes Felden
Endereço eletrônico: ericofelden@gmail.com