ANALYSIS OF THE RELATIONSHIP BETWEEN LEISURE PHYSICAL ACTIVITY AND DIGITAL MEDIA DURING THE PANDEMIC: A FOCUS ON THE BRAZILIAN UNIVERSITY COMMUNITY

ANÁLISE DA RELAÇÃO ENTRE A PRÁTICA DE ATIVIDADES FÍSICAS E LAZER VIRTUAL DURANTE A PANDEMIA: UM OLHAR PARA A COMUNIDADE UNIVERSITÁRIA BRASILEIRA

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Abstract. This study analyzed the association between the digital/online media used for leisure physical activity (LPA) before the COVID-19 pandemic and the use of digital/online media for LPA during the pandemic among university students. We conducted a cross-sectional study with undergraduate and postgraduate students (n=1,679) from the Federal University of Uberlândia, who completed an adapted online survey. The associations between the variables: Odds Ratio (OR), complemented by a 95% confidence interval (95%CI) using binary logistic regression analyzed the use of recorded videos, live streaming, training program sheets, smartphone applications (apps), and video conferencing before and during the pandemic. The significance level was set at 5%. The results showed that students who did not use digital media for LPA before the pandemic were more likely not to continue using digital media during the pandemic (not using recorded videos, OR: 9.19; 95%CI 5.00-16.89; not using live streaming, OR: 35.04; 95%CI 7.78-157.79; not using training program sheets, OR: 39.38; 95%CI 7.30-212.54; not using apps, OR: 6.20; 95%CI 3.74-10.28). Thus, students who did not have the behavior of using digital media for LPA before the pandemic continued not showing this behavior during the pandemic, regardless of sociodemographic characteristics.

Keywords: Leisure; University Students; Physical Activity; Covid-19

Resumo. Este estudo objetivou analisar a associação entre as mídias digitais/online utilizadas para a atividade física de lazer (AFL) antes da pandemia de COVID-19 e o uso das mídias digitais/online para a AFL durante a pandemia entre universitários. Foi realizado um estudo transversal com alunos de graduação e pós-graduação (n=1.679) da Universidade Federal de Uberlândia, que responderam a um questionário online. As associações entre as variáveis: uso de vídeos gravados, transmissão ao vivo, planilhas de programas de treinamento (PPT), aplicativos para smartphone (apps) e videoconferência antes e durante a pandemia foram analisadas por Odds Ratio (OR), complementado por um intervalo de confiança de 95% (95% CI) usando regressão logística binária. Os resultados mostraram que os alunos que não usavam mídia digital para AFL antes da pandemia tinham maior probabilidade de não continuar usando mídia digital durante a pandemia (não usar vídeos gravados, OR: 9,19; IC95% 5,00-16,89; não usar transmissão ao vivo, OR: 35,04; IC 95% 7,78-157,79; não usar PPT, OR: 39,38; IC 95% 7,30-212,54; não usar apps, OR: 6,20; IC 95% 3,74-10,28). Assim, os alunos que não apresentavam o comportamento de uso de mídias digitais para AFL antes da pandemia continuaram não apresentando esse comportamento durante a pandemia.

Palavras-chave: Lazer; Universitários; Atividade Física; Covid-19

1. INTRODUCTION

The COVID-19 global health emergency, Brazil's sluggish economy, the high unemployment rates, more than 100 million Brazilians in food insecurity, and the termination

of important social welfare benefits led the largest country in Latin America to plunge into a political, social, and economic crisis (Werneck & Carvalho, 2020).

Uberlândia is a city in the state of Minas Gerais-BR that proposed a model of municipal response to COVID-19 based on "waves" at the beginning of the pandemic. The model was broken down into four phases and a neutral zone – classified as purple. The neutral zone, or "purple wave", included non-essential commercial establishments and recreation services, namely gyms, cultural events, and leisure activities. These sectors were called "neutral zones" because it was not possible to predict when the establishments would resume activity (Government of the State of Minas Gerais, 2020).

In the educational field, Ordinance n. 305 of March 13, 2020, addressed the creation of the COVID-19 Monitoring Committee at the Federal University of Uberlândia (FUU), where this study was carried out. On the same day, academic activities were partially suspended. The total suspension of classes and teaching-related activities at FUU took place on March 16, 2020, based on the Recommendation of the Public Ministry of the State of Minas Gerais (Federal University of Uberlândia, 2022).

The closure of sports and leisure centers and suspension of activities at the university, with no date to reopen, significantly impacted students' leisure dynamics. Studies show that regardless of age group, engagement in leisure and physical activity experiences decreased during the pandemic (Malta et al., 2020; Teodoro et al., 2020) as people spent more time consuming various online media (Dominski & Brandt, 2020). Although COVID-19 has surpassed the number of deaths from heart attacks in 2021, the global burden of mortality is related to chronic diseases, such as ischemic heart disease, which can be avoided by maintaining physical activity (GBD 2021 Causes of Death Collaborators, 2024).

There is ample evidence of the benefits of physical activity, especially in contexts that include social distancing and quarantine, which are associated with post-traumatic stress disorders and mental illness (Brooks et al., 2020). Besides, regular physical activity helps reduce the risk of infections, increase immune responses, and enhance physical health (Matias et al., 2020); the benefits will remain the same before, during, and after the pandemic. However, these justifications may not make much sense for people isolated at home, especially if the physical activity intervention is unrelated to the individual's experience of feeling autonomous and empowered. Moreover, we must consider that physical activity should not point to external contingents, such as feelings of pressure and guilt (Matias & Dominski, 2020). If people are not intrinsically motivated and if they do not add value or pay attention to the psychological and emotional issues of individuals engaged in physical activity, the physical benefits will not be enough to be included in their daily routine and to search for the valued healthy lifestyle (Matias, 2019).

In this sense, studies indicate that people who were not physically active before the pandemic were likely to maintain the same behavior during the pandemic (López-Valenciano et al., 2021). The global prevalence of insufficient physical activity has increased over the years, and it was estimated at 31.3% (95% CI: 28.6-34.0) in 2022, whereas it was at 23.4% (21.1-26.0) in 2000 and 26.4% (24.8-27.9) in 2010 (Strain et al., 2024). As in other contexts, people who were not motivated to be physically active in childhood became physically inactive adults (Hayes et al., 2019; Sousa et al., 2016; Štefan et al., 2018). Regarding the university students at FUU, a recent survey concluded that leisure physical activity (LPA) performed during childhood and adolescence can influence the maintenance of physical activity even in adverse situations, such as social distancing during the COVID-19 pandemic (Tavares et al., 2020). A scoping review of 22 studies on recommendations for the practice of physical activity and exercise during the COVID-19 pandemic focused on the use of digital technologies aimed at maintaining the practice in individual or group contexts, carried out mainly at home, but also outdoors (Mattos et al., 2020). Exercises that use digital resources, such as online courses,

videos, and applications for self-organized activities, have shown to have the potential to stimulate practice to meet the guidelines for physical activity practice. On the other hand, the characteristics of the use of online media, such as the participants' preferences, the conditions of training programs, care for the prevention of adverse events, the individual aspects of physical fitness and social interactions in group activities, alongside the possibility of synchronous supervision, were elements that promoted or hindered practice (Ebert, Streicher & Notthoff, 2024).

On the other hand, it is necessary to understand the use of digital resources for the practice of physical activities/exercise over time and, thus, understand this use before the pandemic event and how this behavior was employed due to social distancing requirements. It is possible that the adoption of digital media, although already widespread, gained followers only due to the need to maintain such practice in the home context. Therefore, this article aimed to analyze the association between the digital media used for LPA before the COVID-19 pandemic and the use of digital media for LPA during the pandemic among university community members.

2. MATERIAL AND METHODS

This is a cross-sectional study that was carried out with undergraduate and graduate students at FUU. The research focused on analyzing the impacts of COVID-19 on the health and well-being of university students, and the data collected is related to the student's emotional health, drug consumption, food consumption patterns, physical activity, and sedentary behavior, as well as impacts and support (family, friends, institution, environment). It was developed by Husport - Junior Company of the Faculty of Physical Education and Physiotherapy (FUU) in partnership with GERE - Research Group on Sports, Leisure and Health Management (FUU)[1]. To select the sample, we searched the university website to identify the courses offered, namely 82 courses distributed across seven campuses in the cities of Uberlândia, Monte Carmelo, Patos de Minas, and Ituiutaba. This study was approved by the Research Ethics Committee under number CAAE (Certificate of Submission for Ethical Appraisal): 4082623.

Participants: The total number of undergraduate and graduate students from the different campuses for the academic year 2020 was 25,111. The minimum estimated sample was 1,024 students, using a margin of error of 3 percentage points, a 50% prevalence due to the survey of different health outcomes, and a 95% confidence level (Luiz & Magnanini, 2000). A further 10% was added to account for sample losses, totaling 1,126 pupils. The sample was gathered for the sake of convenience. Students enrolling in undergraduate and graduate courses at FUU were included, while respondents who gave an incomplete questionnaire were eliminated.

Procedure: Data was collected from May 05 to June 31, 2020, and all classes and face-to-face activities were halted during this time, according to the decisions of the Municipal Committee to Fight against COVID-19 and the COVID-19 Monitoring Committee at FUU.

The survey available on Google Forms was first sent to the coordinators of each course and then to the students of all FUU courses via electronic mail. Students were also invited to participate via the FUU official website and social networks, such as Instagram and Facebook. We used an online survey adapted from the Health Indicators and Quality of Life in Academics (ISAQ-A) (Sousa et al., 2013) and developed for research among university students. This survey included open and closed questions, divided into five large blocks: Block 1 (b1) - sample characterization; Block 2 (b2) - environment; Block 3 (b3) - lifestyle and health; Block 4 (b4) - previous and present leisure and campus-based physical activity; Block 5 (b5) - impacts and support.

[1] You can check the complete survey at the following webpage: https://comunica.ufu.br/noticias/2020/07/impactos-da-covid-19-na-saude-e-bem-estar-de-estudantes-universitarios.

The variables investigated in this study were related to the reported non-use of digital media for LPA during the COVID-19 pandemic, such as recorded videos, live streaming, apps, training program sheets and video conferencing. The variables analyzed according to the main characteristics of the research refer to the digital media used for LPA before the pandemic: recorded videos, live streaming, apps, training program sheets, videoconferencing, gym and own training program. All questions offered a yes-no answer option. The survey included duplicate questions organized into two parts: before and during the pandemic.

Analysis: An SPSS software, version 24.0, analyzed the data. Descriptive statistics were used with absolute and relative frequencies, mean and standard deviation of the sample characterization variables. Odds Ratio (OR) measured the association between the digital media used for LPA before the pandemic and the non-use of digital media for LPA during the pandemic, complemented by a 95% confidence interval (95%CI) through binary logistic regression in the adjusted analyses. The adjustment was conducted simultaneously with all factors: the variables related to digital media for LPA prior to the pandemic, as well as the sociodemographic data. The level of significance was fixed at 5%.

Context: Before delving into the results and discussion of digital media for LPA, it is important to contextualize the population studied.

Access to sport and leisure is a social right for all Brazilians; however, given the country's historical and political background, the State still does not guarantee basic constitutional rights for most of the population, such as the right to basic shelter and housing, food and sanitation. Thus, leisure, culture and sport have become "second-order" rights (Athayde et al., 2015), which consequently impact funding for venues and facilities and public policy guidelines to ensure the rights related to LPA for the population.

A practical example is worth mentioning: data from several studies with the Brazilian population give insight into the time spent on physical activity in four domains, which makes it possible to develop multiple indicators of the physical activity pattern at work, in household activities, during leisure and transportation activities. According to the major national survey conducted by the Brazilian Ministry of Health, called "Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey" (VIGITEL), the frequency of LPA of 150 minutes of moderate physical activity per week among Brazilians was only 39% (Brazil, 2020). Regarding the other domains, we noted that people were considered physically active, such as in the work and transportation domains (Guthold et al., 2018; Wilbur et al., 1999). This raises an alarm: physical activities performed during leisure time is related with human development, especially considering that leisure is a privileged human dimension carried out within a context marked by the perception of freedom (Bramante, 1998, 2020).

In addition, if we really value the association between physical activity and health, we should pay attention to population studies that found an association between greater LPA and a reduction in major adverse cardiovascular events and risk of all-cause mortality, as well as a connection between greater physical activity at work and increased risks of all-cause mortality (Coenen et al., 2018; Hermansen et al., 2019). In other words, is it really true that "Every Move Counts" (World Health Organization, 2020)? This preamble about the Brazilian context is of utmost importance when we consider that this article's results cannot be disconnected from the social, historical, and political situation in which we live.

3. RESULTS

1,679 FUU undergraduate and graduate students participated in the study. Table 1 summarizes the sociodemographic characteristics and digital media for LPA before the pandemic. There was a greater participation of women (64.8%), whites (63%), residents maintaining social distance, and participants who owned a computer and had access to the internet. Over 90% of students did not use digital media for LPA before the pandemic.

Table 1. Description of sociodemographic and behavioral variables. Minas Gerais, 2020.

Variables	n	Mean (SD)	%
Gender			
Female	1,085		64.8
Male	580		34.7
Other	8		0.5
Income			
No income	23		1.4
Up to 1 minimum wage	176		10.5
From 1 to 3 minimum wages	689		41.0
From 3 to 6 minimum wages	448		26.7
From 6 to 9 minimum wages	343		20.4
Own a computer			
Yes	1,274		91.6
No	117		8.4
Have internet access			
Yes	1,470		88.7
No	187		11.3
Race/Skin color			
White	1,057		63.0
Black	163		9.7
Brown	428		25.5
Yellow	25		1.5
Indigenous	6		0.4
Number of home residents	1,679	2.61 (1.45)	
Residents maintaining social distance			
I live alone	66		4.0
Yes	967		58.0
No	634		38.0
Did not use recorded videos before the pandemic	1,559		93.2
Did not use live streaming before the pandemic	1,653		98.8
Did not use apps before the pandemic	1,525		91.2
Did not use training program sheets before the pandemic	1,647		98.4
Did not use video conferencing before the pandemic	1,669		99.8
Did not go to the gym before the pandemic	690		41.2
Did not exercise on their own before the pandemic	1,363		81.5

n: sample; %: Proportion; SD: Standard deviation.

Table 2 shows the association between the digital media used for LPA before the pandemic and the non-use of recorded videos during the pandemic. Students who did not use recorded videos and went to the gym before the pandemic were more likely not to use recorded videos for LPA during the pandemic. Conversely, the chances of using recorded videos for those not using the APP were lower.

Table 2. Association between the digital media used for LPA before the pandemic and the non-use of recorded videos during the pandemic. Minas Gerais. 2020

Did not use digital media for LPA before the pandemic	Do not use recorded videos during the pandemic	
	OR (95%CI) adjusted*	P
Did not use recorded videos before the pandemic	9.19 (5.00-16.89)	<0.001
Did not use live streaming before the pandemic	0.39 (0.11-1.38)	0.14
Did not use apps before the pandemic	0.54 (0.29-0.99)	0.048
Did not use training program sheets before the pandemic	0.38 (0.09-1.67)	0.20
Did not use video conferencing before the pandemic	0.88 (0.01-81.83)	0.96
Did not go to the gym before the pandemic	1.59 (1.04-2.43)	0.03
Did not exercise on their own before the pandemic	1.43 (0.81-2.51)	0.22

*Adjusted for the use of live streaming during the pandemic, apps during the pandemic, training program sheets during the pandemic, video calls during the pandemic, gym during the pandemic, race/skin color self-declaration, number of residents at home, residents maintaining social distance, income, gender, having a computer and access to the internet.

Table 3 addresses the association between the digital media used for LPA before the pandemic and the non-use of live streaming during the pandemic. Notably, students who did not use live streaming before the pandemic were more likely not to use live streaming for LPA during the pandemic. On the other hand, the chances of not using live streaming were lower for those who did not use recorded videos before the pandemic.

Table 3. Association between the digital media used for LPA before the pandemic and the non-use of live streaming during the pandemic. Minas Gerais. 2020.

Did not use digital media for LPA before the pandemic	Do not use live streaming during the pandemic	
	OR (95%CI) adjusted*	p
Did not use recorded videos before the pandemic	0.26 (0.08-0.87)	0.03
Did not use live streaming before the pandemic	35.04 (7.78-157.79)	<0.001
Did not use apps before the pandemic	1.40 (0.61-3.23)	0.42
Did not use training program sheets before the pandemic	4.01 (0.85-18.86)	0.08
Did not use video conferencing before the pandemic	-	-
Did not go to the gym before the pandemic	1.37 (0.71-2.63)	0.35
Did not exercise on their own before the pandemic	0.56 (0.19-1.59)	0.27

* Adjusted for the use of recorded videos during the pandemic, apps during the pandemic, training program sheets during the pandemic, video calls during the pandemic, gym during the pandemic, race/skin color self-declaration, number of residents at home, residents maintaining social distance, income, gender, having a computer and internet access.

Table 4 demonstrates the association between the digital media used for LPA before the pandemic and the non-use of smartphone applications during the pandemic. Students who did not use apps before the pandemic were more likely not to use them for leisure during the pandemic. Students who did not use live streaming before the pandemic were less likely to use an app during the pandemic.

Table 4. Association between the digital media used for LPA before the pandemic and the non-use of apps during the pandemic. Minas Gerais. 2020.

Did not use digital media for LPA before the pandemic	Do not use apps during the pandemic	
	OR (95%CI) adjusted*	p
Did not use recorded videos before the pandemic	0.93 (0.48-1.79)	0.82
Did not use live streaming before the pandemic	0.19 (0.05-0.74)	0.02
Did not use apps before the pandemic	6.20 (3.74-10.28)	<0.001
Did not use training program sheets before the pandemic	0.38 (0.08-1.92)	0.24
Did not use video conferencing before the pandemic	4.34 (0.17-109.79)	0.37
Did not go to the gym before the pandemic	1.00 (0.67-1.50)	1.00
Did not exercise on their own before the pandemic	0.72 (0.40-1.28)	0.26

* Adjusted for the use of recorded videos during the pandemic, live streaming during the pandemic, training program sheets during the pandemic, video calls during the pandemic, gym during the pandemic, race/skin color self-declaration, number of residents at home, residents maintaining social distance, income, gender, having a computer and internet access.

Table 5 shows the association between the digital media used for LPA before the pandemic and the non-use of training program sheets during the pandemic. We can see that students who did not use training program sheets before the pandemic were more likely not to use them during the pandemic.

Table 5. Association between the digital media used for LPA before the pandemic and the non-use of training program sheets during the pandemic. Minas Gerais. 2020.

Did not use digital/online media for LPA before the pandemic	Do not use training program sheets during the pandemic	
	OR (95%CI) adjusted*	p
Did not use recorded videos before the pandemic	0.52 (0.05-5.84)	0.59
Did not use live streaming before the pandemic	14.36 (0.53-390.12)	0.11
Did not use apps before the pandemic	0.77 (0.12-4.72)	0.78
Did not use training program sheets before the pandemic	39.38 (7.30-212.54)	<0.001
Did not use video conferencing before the pandemic	-	-
Did not go to the gym before the pandemic	4.96 (0.52-46.93)	0.16
Did not exercise on their own before the pandemic	3.86 (0.27-55.48)	0.32

* Adjusted for the use of recorded videos during the pandemic, apps during the pandemic, lives during the pandemic, video calls during the pandemic, gym during the pandemic, race/skin color self-declaration, number of residents at home, residents maintaining social distance, income, gender, having a computer and internet access.

Table 6 displays the association between the digital media used for LPA before the pandemic and the non-use of video conferencing during the pandemic. Notably, students who did not use a gym before the pandemic were more likely not to use video conferencing for leisure during the pandemic.

Table 6. Association between the digital media used for LPA before the pandemic and the non-use of video conferencing during the pandemic. Minas Gerais. 2020.

Did not use digital/online media for LPA before the pandemic	Do not use video conferencing during the pandemic	
	OR (95%CI) adjusted*	p
Did not use recorded videos before the pandemic	2.10 (0.50-8.78)	0.31
Did not use live streaming before the pandemic	0.83 (0.06-11.14)	0.89
Did not use apps before the pandemic	0.65 (0.15-2.75)	0.56
Did not use training program sheets before the pandemic	-	-
Did not use video conferencing before the pandemic	-	-
Did not go to the gym before the pandemic	3.59 (1.01-12.70)	0.047
Did not exercise on their own before the pandemic	1.13 (0.17-7.29)	0.90

* Adjusted for the use of recorded videos during the pandemic, lives during the pandemic, apps during the pandemic, training program sheets during the pandemic, gym during the pandemic, race/skin color self-declaration, number of residents at home, residents maintaining social distance, income, gender, having a computer and internet access.

4. DISCUSSION

Recent studies have reported data on high rates of physical inactivity and worsening of behavioral risk factors during the COVID-19 pandemic (Caputo & Reichert, 2020; Di Sebastiano et al., 2020; Peçanha et al., 2020; Sport England, 2020). Many of these studies focused on *bio-logic* discussions[2], according to which physical activity stimulates our immune system, neutralizing some comorbidities, such as obesity, diabetes, and hypertension, which make people more susceptible to COVID-19. It also potentiates positive immunomodulation provided by light to moderate intensity physical exercise (Silva et al., 2017; Laddu et al., 2021; Pitanga et al., 2020; Woods et al., 2020).

Furthermore, public communication and recommendations of Brazilian health institutions and educational guidelines on physical activity disseminated by various social spheres have been based on the biological and deterministic notion of LPA. The discourses about physical

[2] The notion that only biology provides a logical basis for the organization of the social world (bio-logic). The notion of "bio-logic" was extracted from the book "The Invention of Women" (2021) by Nigerian sociologist Oyèrónkẹ́ Oyěwùmí.

activity during the pandemic aimed at the general population (i.e., lay people); they combined marketing strategies, focused on people's self-determination (Knuth et al., 2020), and consequently exempted the State from the responsibility of taking care of the population's health. Thus, the mediatic and pedagogical apparatus induces individuals to believe they are solely responsible for maintaining their well-being and health.

In addition to the continuous attempt to remove the State's responsibility in health care, it was already assumed that public health recommendations would potentially reduce the population's daily physical activity. This assumption proved correct: a survey carried out with 45,161 Brazilians concluded that young adults aged 18 to 29 years old, who represent most of the university population, reduced levels of physical activity during the pandemic. 32.6% of them were physically active before the pandemic, and during the pandemic, only 10.9% met the recommended level of physical activity (Malta et al., 2020). Another survey with 2,004 people living in all five regions of Brazil also had similar results (Costa et al., 2020). These findings can be explained by the confinement, social isolation, and closure of spaces previously used for physical activities and other leisure activities, such as parks, gyms, cultural venues, and public squares.

Studies based on the *bio-logic* notion, however, fail to disregard that the dynamics involving individuals-space relationships were modified with the COVID-19 pandemic, namely the relationship with their own home, work, daily tasks, leisure, as well as the relationship with themselves and peers. Therefore, understanding how leisure was being lived can be rather challenging, especially physical activity related to digital leisure.

Our study found a common result: university students who did not use digital media and the internet for LPA before the pandemic continued not using this media during the pandemic. Physical activity performed during leisure time was not altered. Despite this outcome, a large body of data concludes that digital media and the internet may be useful tools for promoting physical activity in the population. Studies have already confirmed the effectiveness of web-based services for behavioral interventions in the search for an active life (Davies et al., 2012; Joseph et al., 2014).

Contrary to our findings, some studies point to a significant increase in the use of online social networks for the creation of digital content, such as live streaming on Instagram, TikTok and Facebook (Couto et al., 2020), as well as for social interactions, especially during the COVID-19 pandemic. As human beings, we live in a communal culture characterized by a high level of sociability; in an attempt to establish a kind of "harm reduction" in the absence of personal affection, it was important to encourage the use of technologies to ensure social interactions during social isolation (Ayuso et al., 2020).

Our social universe has become increasingly digitized, and now digitization pervades all aspects of our lives, including leisure time (Schultz & McKeown, 2018). These technological innovations have entered people's homes, workplaces, communities, and other settings, where they gained significant popularity. However, although virtual devices combined with traditional/common exercise equipment can enhance the psychological and biological effects of physical activity (Gao & Lee, 2019), as well as provide additional psychological benefits that might improve the chances of long-term exercise routines, foster a sense of healthy competition and motivation, ultimately leading to a more enjoyable workout experience overall (Erkkmen & Asti, 2016), our findings showed that web-based digital tools alone were insufficient to help university students maintain physical activity. This result contradicts global trends toward digital leisure (Silk et al., 2016), e-leisure (Nimrod & Adoni, 2012), and/or virtual leisure (Schwartz, 2003).

Comparative research between periods before and during the pandemic showed that in terms of behavior maintenance, for example, people who were sufficiently active before the pandemic remained sufficiently active during it. The opposite is also true: people who were

physically inactive before the pandemic remained physically inactive (Costa et al., 2020; Gilic et al., 2021). A similar study compared sufficiently active and insufficiently active individuals (adults but not university students) during the lockdown and showed that the former engaged even more in PA, whereas the latter maintained the pattern (i.e., not enough) or engaged even less compared to before the lockdown. This article found that respondents saw the lockdown as an opportunity to increase exercise behaviors. This study was conducted in Belgium (Symons et al., 2021).

In Global North countries, or just "high-income countries", we can cite and/or reference other similar examples: Fearnback et al. (2021) aimed to identify individual-level factors that protected people against declines in PA levels amid the COVID-19 restrictions. They found that substituting pre-pandemic gym attendance with the *purchase* and use of home exercise equipment or exercise through virtual fitness platforms increased the PA during the COVID-19 lockdown, and 55% of the participants reported increases in or maintenance of PA during that time – a study carried out in the United States. Studies carried out in China[3] explore the role of virtual reality fitness in improving overall well-being during the COVID-19 pandemic. Peng et al. (2022) concluded that house exercises through virtual reality fitness were a good substitute for public gyms and private group fitness programs during the first pandemic wave for physical-psychological and overall well-being. Also, Liu et al. (2022) explain that in situations with limited physical activity resources, smart applications are an essential alternative to gyms and change people's attitudes regarding the adoption of healthy behaviors. These apps have made exercise and physical activity more accessible and easier to be incorporated into daily routines.

Many studies have now shown that the COVID-19 pandemic had significant effects on PA behaviors (Malta et al., 2021; Flanagan et al, 2020; Meyer et al., 2020; Cancello et al., 2020; Gilic et al, 2021). But we need to pay attention to the current situation, which is of widening existing income-related disparities in health/PA behavior (Couch; Fairlie; Xu, 2020; Siapush et al., 2019). Even though the essence of the discourse has been of emphasizing that physical activity can remedy the disease, thus producing health, or vice versa (Carvalho, 2016), seemingly there were no major changes in the behavior of physically inactive people during the COVID-19 pandemic – especially in Brazil.

This aligns with our results when behavior, adherence, and motivation for LPA are considered. We should question how we are acting in the face of the stimulus for physical activity, as well as whether the strategies used so far are successful or not. When we look at the population's levels of physical activity before the pandemic, they were confirmedly already below the levels recommended by the World Health Organization – being considered as a pandemic, i.e., the pandemic of physical inactivity (Pratt et al., 2020). COVID-19 has eventually brought light to the "worsening" of an already "bad" situation.

There is a gap between where the research is being done, where the results are being published and where health problems and solutions are (Hallal et al., 2012). Are the discourses focused on the risks of disease, intended to frighten and scare the population, really working? Are we considering the individuals' interests, spaces, equipment, meanings, contents, restrictions and possibilities to promote LPA by using digital media? Are the offers of and investments in media stimuli, courses, live streaming, online classes, and training apps enough to fully engage people in physical activity?

Firstly, despite the wide range of health services available online, as well as various interventions to increase the levels of physical activity, web-based tools for digital leisure for LPA are mostly used by young people and people with higher education – complete higher

[3] China is not a "global north country" or a high-income country; however, for more than thirty years, it has implemented and adopted a series of systemic policies that remain aligned with a development project in which scientific and technological progress are central elements (Cassiolato, 2013).

education (Andreassen et al., 2007; Jahangiry et al., 2017). Can the studies that had positive results on the use of digital tools to promote physical activity be applied to the Brazilian context? In a population-based study conducted in Bagé, Rio Grande do Sul, only 7,7% of participants reached 150 minutes in LPA during the pandemic, and the prevalence of PA ranged from 9.8% among participants with lower schooling to 50.9% among those with completed higher education (Crochemore-Silva et al., 2020). In Brazil, only 20% of the population has completed higher education (INEP, 2021). Secondly, given the possibility of using digital tools for physical activity, it is assumed that social and environmental dynamics will be absent – social development, empowerment, affection and other benefits from the social connections offered by physical activity performed in outdoor environments (Lima, Piovani, Lima, 2018). Finally, people who are already physically active provide data for research that concludes that physical activity interventions through digital media are successful (Matias & Dominski, 2020).

We see positive short-term results: in a two-year follow-up internet-based survey, the adolescent girls who participated in the program significantly reduced body fat after the first six months of intervention. However, even though they had access to the program, the access decreased dramatically after 18 months, and they eventually regained the lost weight (Williamson et al., 2006). Thus, based on other studies on LPA, it seems that interventions using digital media have short-term effects (Hamel et al., 2011; Jahangiry et al., 2017); consequently, it is important to emphasize that efforts are necessary to sustain possible and future changes in the long term with the use of online and/or digital tools.

The role of technology is indisputable; the social impact and benefits of using the internet and digital media, as well as the advantages of web-based physical activity (i.e., low implementation costs, easy management and scalability) (CDC, 2020), are vastly discussed in scientific papers (Carbonell & Oberst, 2015; Cloquell, 2015). However, our results demonstrate that content management and funding in web experience are not enough for people to engage in virtual LPA in the Minas Gerais university context.

Social conditions may support or hinder motivations for physical activity, especially during a pandemic that changed people's lives in such an unexpected and abrupt way. Furthermore, while the importance of affective antecedents of physical activity programs is well established, whether they are web-based or not, the actions for implementing and creating strategies to change people's lifestyles have overlooked the motivation and complex elements that pervade the individual's "physical" aspect (Matias, 2019; Polo et al., 2020; Viana et al., 2010).

Study Limitations: Given its online research method, our study may have some limitations. Accordingly, only those students with access to the internet and adequate devices–who are usually more participative in online surveys–may have participated. However, due to the pandemic, this method has been increasingly accepted and supported for developing studies (Boni, 2020; Sousa et al., 2020).

5. CONCLUSION

In our study, a survey with 1,679 members of the university community provided valuable input for understanding the relationships between digital leisure, digital tools, and physical activity in the Brazilian context. We can highlight one point: the digital tools that can support digital leisure for university students are not used for physical activity. This way, the supply and demand for and increasing use of technologies, digital media, and internet technologies during the pandemic were insufficient to start a behavior change process and maintain physical activity within the university community.

The boundaries between the spheres of our lives are increasingly tenuous and diffuse: it is, therefore, interesting to approach LPA as a social, political, cultural, and historical phenomenon; it is influenced by and also influences the interlacing threads of relationships and

social contradictions. In this sense, it is imperative to consider the individuals' social, affective, and psychological responses and the context in which these people are and that the epistemological bases and theoretical formulations of psychology and sociology be accepted in constructing democratic structures to promote physical activity.

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