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## Time of permanence in laboral activity in employees of a fitness center during the Covid-19 pandemic

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### Abstract

**Background/objective:** Maintaining the functioning of the fitness centers during the Covid-19 pandemic can provide economic benefits, as well as important advantages for the promotion of the population's health. The objective of this study was to identify the length of time of permanence on work activities for employees of a fitness center, which uses biosafety protocols, during the Covid-19 pandemic.

**Methods:** The sample consisted of 64 employees from a fitness center in the city of Salvador, Bahia, Brazil who were followed up from August 11, 2020 to March 1, 2021 (200 days). The data were analyzed using the Kaplan-Meier survival curves. The comparison of the time curves in days, considering each variable selected until the occurrence of leave from work, in function of a positive test for Covid-19, was done through the statistical test "Log-Rank".

**Results:** The average length of stay in work activities was 195.1 days, with only 4 (6.2%) of the total employees being away from work for testing positive for Covid-19. In contrast, 60 (93.8%) of the employees remained at work without leave by Covid-19. The variables sex and age were not identified as potential determinants of the time until the occurrence of the leave, while among administrative service employees, despite the low number, there were more absences.

**Conclusion:** The results of this study indicate that the possibility of infection by Covid-19 in fitness centers seems to be low, especially when the biosafety protocols determined by the health authorities are complied.

**Keywords:** physical activity, survival curves, Covid-19

### Introduction

During the Covid-19 pandemic, several sectors of the world economy, including fitness centers, were disallowed to function by government authorities in different countries, a fact that may have caused economic losses, in addition to damage in relation to the reduction in activity physical and physical fitness, as well as in relation to the increase in the sedentary behavior of the population<sup>[1, 2, 3]</sup>.

In this context, since the beginning of the pandemic, several researchers have called attention to the importance of maintaining the practice of physical activity, as well as reducing sedentary behavior, considering the great benefits for the cardiovascular, metabolic, immune systems, in addition to improving health. Mental<sup>[4, 5, 6]</sup>.

In a recent point of view published by Brazilian researchers, the prophylactic and therapeutic effects of regular physical activity on the health and quality of life of the population were emphasized, as well as the possibility of the functioning of the fitness centers during the Covid-19 pandemic, since when all biosafety protocols determined by health authorities were complied with<sup>[1]</sup>.

In this sense, several biosafety protocols have been proposed by health authorities in several countries for the liberation of the functioning of the fitness centers, among them, we can mention: use of face mask during training, better ventilation, distance, limiting physical contact between users, providing hand hygiene and reminding clients and team members to stay at home when they are sick and / or with a fever<sup>[1, 7, 8, 9]</sup>. The adoption and compliance

with these biosafety protocols by fitness centers is very important, since it is speculated that the increase in respiratory effort during physical activity can facilitate the transmission of Covid-19, especially in closed environments<sup>[9]</sup>.

In this way, the present study can bring important information regarding the time of exposure and the safety of the employees of conditioning centers, as they remain for a long period in these spaces. The results of this research may also contribute towards showing that the fitness centers can function during the pandemic, with a low risk of transmission of Covid-19, as long as the biosafety protocols are complied with.

Thus, the objective of the study was to identify the time of permanence in work activities by employees of a fitness center, which uses biosafety protocols, during the Covid-19 pandemic.

## Methodology

### Study Type

This is a prospective longitudinal study conducted at Villa Forma Fitness Center in the city of Salvador, Bahia, Brazil

### Sample

The sample consisted of 64 employees (45 Physical Education Professionals, 11 administrative service employees and 8 general service employees), 36 males with an average age of 41.8 years and 28 females with an average age of 39.0 years, which were followed in the period from August 11, 2020 to March 1, 2021 (200 days).

### Study variables

**Response variable:** Time until the occurrence of sick leave, measured using the Kaplan-Meier survival curves.

**Survival variables:** Censorship (subject remained at work until the end of follow-up) and failure (subject was removed from work for testing positive for Covid-19).

**Exposure variables:** Gender dichotomized into male and female, age dichotomized into < 40 years and ≥ 40 years and type of employee (Physical Education Professional, administrative services employee and general services employee).

### Withdrawal from work due to a positive test for Covid-19

Employees were instructed to inform the company of any symptoms characteristic of Covid-19, such as headache, loss of smell and taste, cough, and fever. From then on, RT-PCR tests were performed to validate the diagnosis.

### Biosafety protocol adopted by the fitness center

The biosafety protocols adopted followed the recommendations of the City of Salvador, Bahia, Brazil, having the following main characteristics<sup>[10]</sup>:

**Occupancy capacity:** The maximum occupancy limit will be 1 customer per 6m<sup>2</sup>.

**Operating model:** There can be no sharing of equipment,

appliances and any utensils. Exercises or movements in pairs, trio or group are prohibited. Collective classes must be marked on the floor of the spaces for each student, with a minimum distance of 2m and a maximum duration of 50 minutes, with a minimum interval of 10 minutes between them, to clean the equipment and environments. There can be no sharing of equipment, appliances and any utensils.

**Specific aspects of the sector:** Upon arrival at establishments, the temperature of employees, service providers and customers must be measured. And those with a result equal to or greater than 37.5 °C should be directed to adequate health monitoring. Sanitizing mats for cleaning feet must be provided at the entrance to the establishment. The use of masks is mandatory during the entire period of stay of the customers, including aerobic activities. Each customer must sanitize the device, equipment and/or utensils before and after use, with 70% alcohol or similar. Equipment must be kept at a distance of at least 1.5m between them, including treadmills, bicycles and the like. Drinkers cannot be used.

**Ethical Issues:** To carry out the research, the company was initially contacted and it agreed to provide us with information about the study participants who signed an informed consent form. In this sense, the study was not submitted to an ethics committee because it is secondary data provided by the company where the research was carried out.

### Statistical Procedures

Data were analyzed using Kaplan-Meier survival curves. The survival function or survival analysis is a technique that allows estimating the time until the occurrence of a particular event under study, as a function of possible explanatory variables. In this type of analysis, the response variable is always the time until the event occurred, the survival variables are identified as: censorship (individual remained free from the event under study until the end of follow-up) and failure (individual was affected by the studied event) and exposure variables are those that can explain the occurrence of the event<sup>[11]</sup>.

In the present study, the event analyzed was the absence from work activities for testing positive for Covid-19. The comparison of the curves of times in days, until the absence for testing positive for Covid-19, in function of each selected variable, was made using the statistical significance test "Log-Rank", with a significance level of 5%. The statistical program STATA 12.0 was used.

### Results

The characteristics of the sample are shown in table 1. It is observed that there are no differences between men and women regarding age, but in relation to the position held in the company, there is a higher percentage of Physical Education Professionals and general service employees among the men and a higher percentage of employees in administrative services among women.

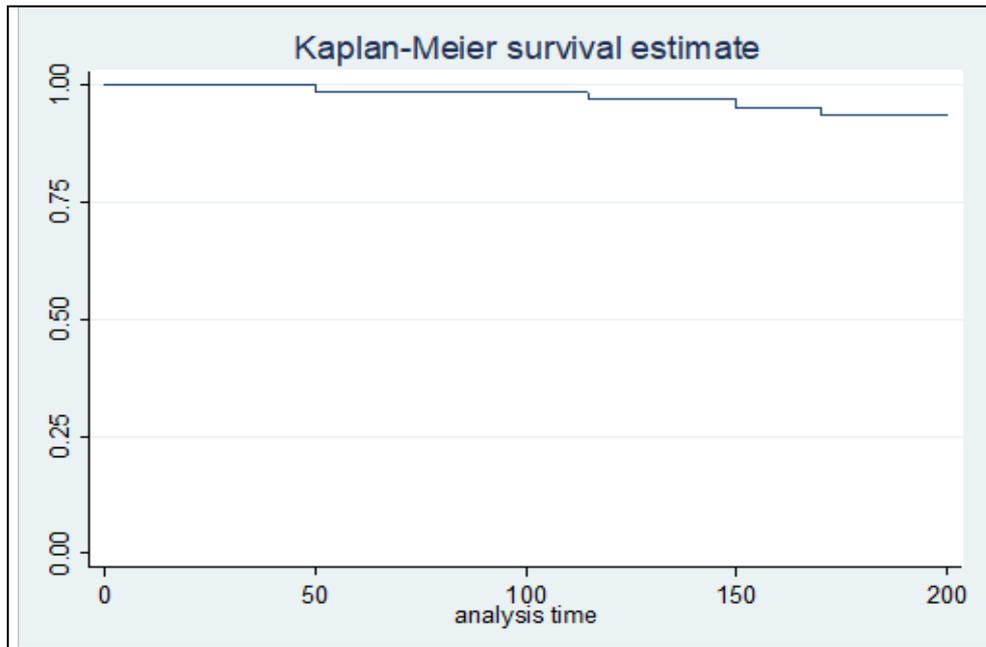
**Table 1:** Characteristics of the study sample

	Men (n=36)	Women (n=28)	p
AGE (years) - n (%)			
<40	21 (58.3)	14 (50.0)	0.51
≥40	15 (41.7)	14 (50.0)	
Company Function - n (%)			
Physical Education Professionals	28 (77.8)	17 (60.7)	0,02
Administrative services	2 (5.6)	9 (32.1)	
General Services	6 (16.6)	2 (7.2)	

Values for men and women were compared using the chi-square test.

The average length of stay in work activities among employees at the fitness center was 195.1 days, in a total of 200 days of follow-up. Only 4 (6.2%) of the total number of employees were removed from work because they tested

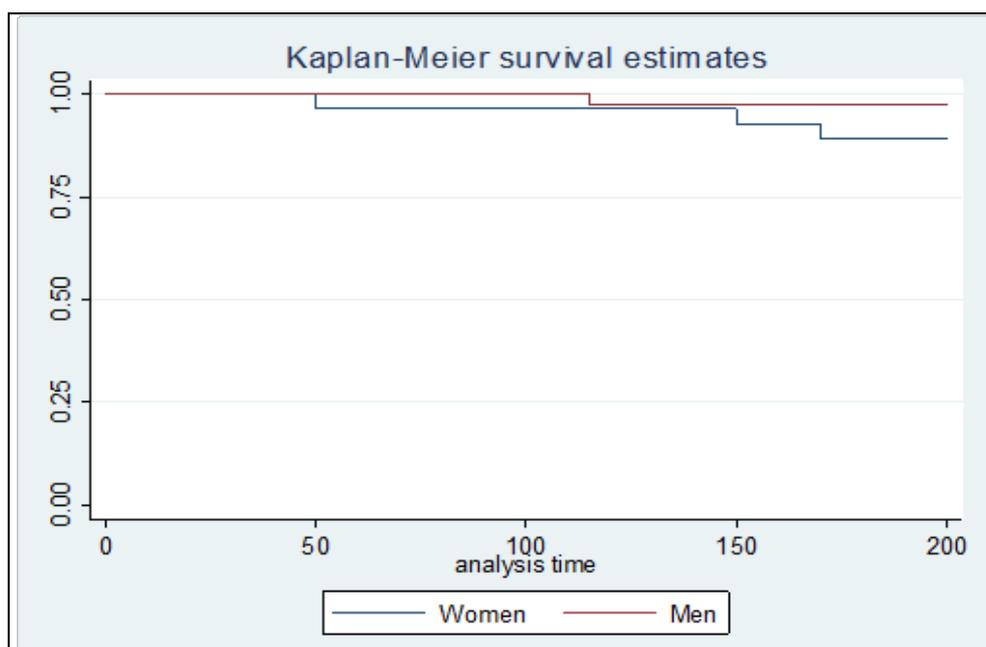
positive for Covid-19. On the other hand, 60 (93.8%) of the company's employees remained working until the end of the follow-up. Figure 1 shows the survival curve for the total sample.



**Fig 1:** Survival curve for the total sample during follow-up.

According to figure 2, the survival curves comparing males and females are observed. There was no difference between

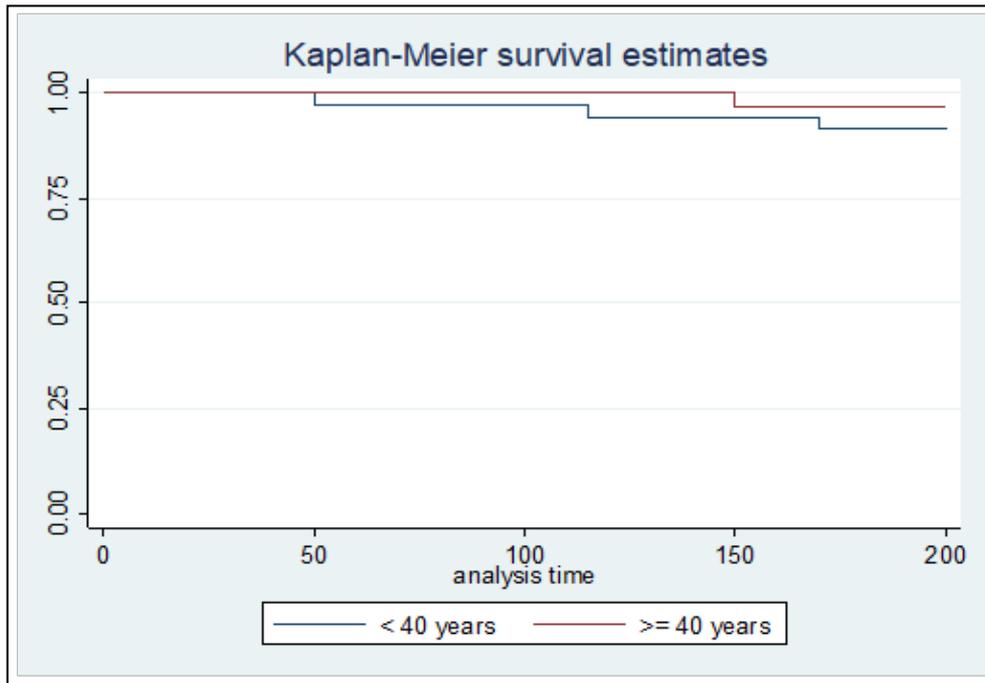
genders in the length of stay in work activities.



**Fig 2:** Survival curves comparing males and females. Log-Rank = 0.1991

Through figure 3, the survival curves are observed comparing the oldest and the youngest. We found no difference between

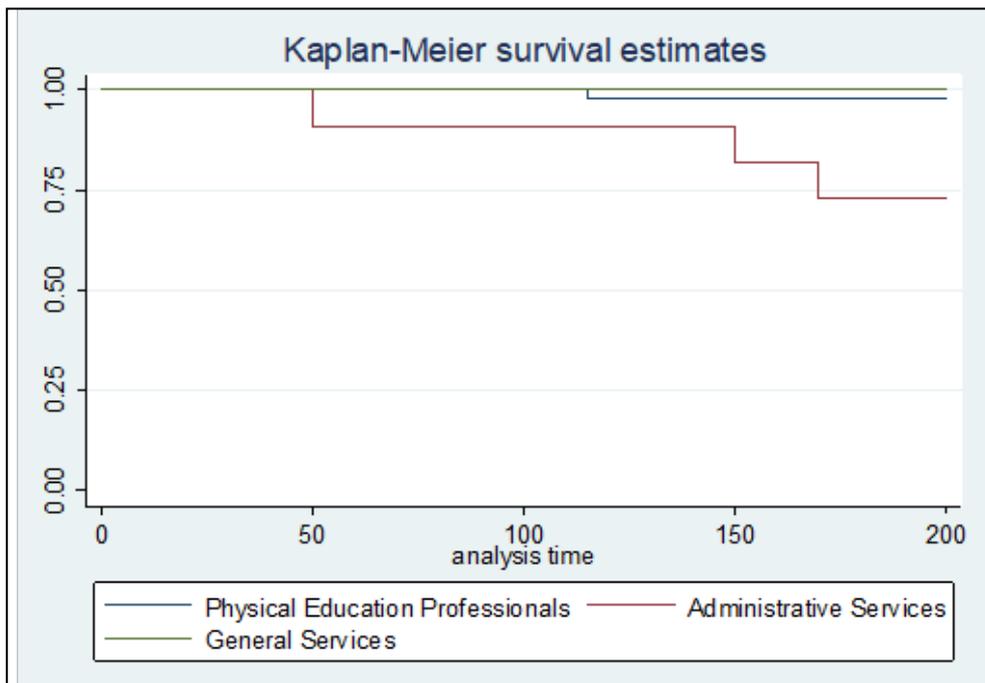
the two groups in the length of stay in work activities at the fitness center.



**Fig 3:** Survival curves comparing those with younger age than 40 years and greater than or equal to 40 years. Log-Rank = 0.3993

Figure 4 shows the survival curves comparing Physical Education Professionals, employees in the administrative sector and employees in the company's general services. It

appears that among employees of administrative services there were more leave from work due to a positive test for Covid-19.



**Fig 4:** Survival curves comparing Physical Education professionals, administrative service employees and general service employees. Log-Rank = 0.0054

**Discussion**

The study analyzed the length of stay in work activities among employees of a fitness center. The results show that 93.8% of the company's employees remained working until the end of the follow-up, without leave for testing positive for Covid-19, which leads us to believe that the possibility of contagion for Covid-19 in these environments is low, obviously if biosafety protocols are strictly adhered to.

In an article published by Belgian and Dutch researchers, it was suggested that a quantifiable certificate of equivalence could be drawn up that could allow fitness centers to function more safely. This document would also be an attempt to encourage increased preparation of indoor sports centers so that they can remain open safely during the next potential waves of Covid-19, as well as future pandemics with similar characteristics. The protocol suggested by the authors foresees

high intensity ventilation in buildings, filtering and the use of face masks. They also suggest that the functioning of fitness centers is of fundamental importance not only to keep people physically active, but also to reduce the economic damage caused by their closing<sup>[3]</sup>.

In our study, the low frequency of absence from work due to a positive test for Covid-19 can be explained by the strict compliance, by the fitness center, with the biosafety protocols established by the local health authorities.

In a recent survey conducted in Saudi Arabia, it was shown that before the pandemic, users of fitness centers did not use any type of hygiene protocol during training. The same authors report that the Ministry of Sport in Saudi Arabia linked the reopening of fitness centers during the pandemic to the adoption of strict biosafety protocols, which must be followed by all indoor exercise practitioners, even after the elimination of the COVID-19 pandemic<sup>[7]</sup>.

On the other hand, a document published in the Morbidity and Mortality Weekly Report (MMWR) reported, in the month of July 2020, high transmission rates of Covid-19 in three fitness centers in Hawaii. The authors noted that transmission was likely facilitated by not wearing full face masks, prolonged close contact between users, and insufficient room ventilation. The same authors suggest that to reduce SARS-CoV-2 transmission in fitness centers, staff members and clients should wear a face mask during physical training, facilities should improve ventilation, promote distance, limit physical contact among users, providing opportunities for hand hygiene; and remind clients and staff members to stay home when sick and/or with a fever<sup>[8]</sup>.

In this sense, biosafety protocols, proposed by health authorities, used in fitness centers, appear as a fundamental ferment so that individuals who perform their physical exercises regularly are protected. Therefore, the maintenance of regular physical activity, respecting all biosafety protocols of health authorities should be encouraged so that injuries resulting from physical inactivity and sedentary behavior are avoided.

In another document also published by the MMWR, an outbreak of Covid-19 was found in a fitness center in Chicago, USA. The authors observed, when analyzing the reasons for the contamination, that a greater number of participants (76%) used face masks infrequently, including people with Covid-19 (84%) and without Covid-19 (60%). They also showed that not using a face mask increased the probability of contamination by 3.5 times. They conclude by suggesting that all employees and clients should wear a face mask, even during high-intensity physical activities, in addition to maintaining social distance while training. In addition, fitness centers should seek to improve internal ventilation, enhance physical detachment, increase opportunities for hand hygiene, and remind all staff and clients to be isolated when experiencing symptoms similar to COVID-19 or after receiving a positive result<sup>[8]</sup>.

It is important to emphasize that, in our study, despite the low number of leaves, employees from administrative services were more affected, probably because they spent more time in the work environment.

The strength of the present study is the use of the survival curve technique in statistical analyses, and as far as we are aware, this is the first time that it is used to analyze the length of stay in work activities for employees of a fitness center during the Covid-19 pandemic.

On the other hand, the study has several limitations, including: the analyzes were not extended to users of the

fitness center service, however, when it was demonstrated that employees who spend more time in the fitness center than users of the service, little distanced themselves from work by testing positive for Covid-19, we can assume that the possibility of contamination is really low. It is noteworthy that users of physical conditioning services spend less time in these spaces than Physical Education Professionals, administrative service employees and general service employees.

In addition, only employees who had symptoms and tested positive for Covid-19 were removed from work. It is noteworthy that the possible asymptomatic infected were considered as not contaminated by Covid-19.

## Conclusions

The results of this study lead us to believe that the possibility of contagion in fitness centers that comply with biosafety protocols determined by health authorities is low. It is suggested that these spaces remain in operation both in the current and in future pandemics with similar characteristics so that both the economy and the health of the population are preserved.

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