ORIGINAL ARTICLE

Dropout predictors at gyms: a retrospective study

Preditores de abandono em academias: um estudo retrospectivo

Predictores de abandono en gimnasios: un estudio retrospectivo

Gledson Tavares Amorim Oliveira[a] (iD), Lucas Camilo Pereira[b] (iD),
Maristela Linhares[b] (iD), Lídia Reniê Fernandes da Silva[b] (iD),
Paulo Ricardo Silva[b] (iD), Hassan Mohamed Elsangedy[b,c]* (iD)

ABSTRACT

This study aimed to verify the risk factors associated with gym regulars' dropout over 12 months. This is an observational, retrospective, cohort study. The sample consisted of two gyms (Gym 1: n=2027, age=39.1 ±13.1 years; Gym 2: n=1775, age=36.8 ±11.6 years). Each participant was followed up for 12 months, or until dropout, by controlling the biometric entry system using a turnstile. The adherence rate was of 11% at Gym 1 and 19% at Gym 2. At both gyms, training frequency ≤3x/month and 4-6x/month was associated with dropout. At gym 1, being a female, aged ≥43 years, and enrollment between October and December were dropout predictors. At Gym 2, dropout was associated with contract length ≤31 days and 32-186 days and enrollment between April and December.

RESUMO

Este estudo teve objetivo verificar os fatores de risco associados ao abandono durante 12 meses. Este é um estudo observacional de coorte retrospectivo. A amostra consistiu de duas academias (Academia 1: n=2027, idade=39,1±13,1 anos; Academia 2: n=1775, idade=36,8±11,6 anos). Cada participante foi acompanhado por 12 meses ou até o abandono, pelo controle do sistema de entrada biométrica, usando uma catraca. A taxa de aderência foi 11% na academia 1 e 19% na academia 2. Em ambas as academias, frequência de treino ≤3x/mês e 4-6x/mês foi associada ao abandono. Na academia 1, ser mulher, idade ≥43 anos, e matrícula ocorrendo entre outubro-dezembro foram preditores de abandono. Na academia 2, o abandono foi associado com duração do contrato ≤31 dias e entre 32-186 dias, e matrícula ocorrendo entre abril-dezembro.

RESUMEN

El objetivo del estudio fue verificar los factores de riesgo asociados al abandono durante 12 meses. Este es un estudio observacional de cohorte retrospectiva. La muestra estuvo constituida por dos gimnasios (Gimnasio 1: n = 2027, edad=39,1±13,1 años; Gimnasio 2: n=1775, edad = 36,8±11,6 años). Se realizó un seguimiento de cada participante durante 12 meses o hasta el abandono, controlando el sistema de entrada biométrico, mediante un trinquete. La tasa de adherencia fue del 11% en el gimnasio 1 y del 19% en el gimnasio 2. En ambos gimnasios, frecuencia de entrenamiento ≤3x/mes y 4-6x/mes se asoció con el abandono. En el gimnasio 1, ser mujer, edad ≥43 años, y la matrícula realizada entre octubre-diciembre fueron predictores de abandono. En el gimnasio 2, abandono se asoció con una duración del contrato ≤31 días y entre 32-186 días, y la matrícula realizada entre abril-diciembre.

[a]Federal University of Rio Grande do Norte, Graduate Program in Health Sciences. Natal, RN, Brazil.
[b]Federal University of Rio Grande do Norte, Graduate Program in Physical Education. Natal, RN, Brazil.
[c]Federal University of Rio Grande do Norte, Department of Physical Education. Natal, RN, Brazil.

*Corresponding author:
Hassan Mohamed Elsangedy
E-mail: hassan.elsangedy@gmail.com

INTRODUCTION

Physical inactivity is considered a pandemic because of its proportion and consequences to society. To expand actions that promote the practice of physical activity, the World Health Organization (WHO) developed a new global action plan called "Let´s be active – more active people for a healthier world"; however, its effective implementation requires leadership combined with multisectoral partnerships, such as governments, non-governmental organizations, and the private sector (WHO, 2018). In this context, gyms are considered as having the potential to cooperate in this process (WHO, 2018).

Adherence to exercise may influence various outcomes, such as pain, physical function, and chronic diseases (Bullard et al., 2019; Nicolson et al., 2017). Adherence is defined as the extent to which people's behavior coincides with the recommendations of the guidelines (WHO, 2003). Therefore, low levels of adherence may decrease the effects of prescribed exercises, which makes it an important aspect to be investigated. Currently, approximately 183 million people exercise in gyms worldwide (IHRSA, 2019), and approximately 9.6 million Brazilians are enrolled in these spaces, corresponding to about 4% of the population (Rodriguez, 2018). However, despite this reality, these establishments face high dropout rates. In this same context, it is noteworthy that the literature on the behavior of people who work out in gyms is quite limited.

In this scenario, the results of a study with a sample consisting of 5240 members of a particular gym in Brazil indicated a dropout rate of 63% over the course of three months and an increase to 96% after 12 months (Sperandei et al., 2016). However, the adherence indicator employed by those authors was the monthly payment, which may not reflect the actual attendance of members, given the possibility of members paying, but not effectively attending the gym. Recently, a research conducted in Spain in three different gyms used the attendance frequency as an adherence indicator, and identified a dropout rate of approximately 51% over the course of 12 months (Clavel San Emeterio et al., 2019). The aforementioned studies present differences; however, both indicate that the probability of dropping out of gyms up to 12 months after enrollment is very high.

Several factors can be associated with such dropout. Sperandei et al. (2016) found a greater risk of gym dropout among people aged ≤25 years, engaged in previous physical activities, motivated by weight loss, and not driven by hypertrophy, health and esthetic aspects. Another research outlined that lower monthly attendance, being a former gym member, having lower monthly expenses, spending less time at the gym, being younger (people aged <33 years), and being a male were factors that determined the dropout by customers (Clavel San Emeterio et al., 2019). Furthermore, other investigations have found that attendance frequency is related to the likelihood of dropping out. Garay et al. (2014) and Clavel San Emeterio et al. (2019) observed that an average monthly frequency greater than eight days was related to a smaller probability of dropping out (50 and 54%, respectively) of physical exercise programs at the researched gym.

Despite the initial motivation for engaging in physical activities at gyms, adherence remains a major challenge for these institutions. Thus, analyzing the dropout rate based on attendance frequency, as well as determining the factors associated with this abandonment may provide relevant information to prepare strategies that aim to support and increase the permanence of members in these establishments. Therefore, this study aimed to verify the adherence rate among members of two gyms over the course of 12 months, and to explore personal characteristics of members that may be associated with dropout during this follow-up period.

METHODS

STUDY DESIGN

This is an exploratory, observational, retrospective, cohort study. Recommendations for observational studies were implemented according to the requirements of the STROBE (STrengthening the Reporting of OBservational studies in Epidemiology) Statement (Malta et al., 2010). This research was approved by the Institutional Ethics Committee of the aforementioned Institution under protocol (no. 3.305.319). The study was developed at two different gyms that offer similar modalities of physical exercises, such as resistance training, running, martial arts, and group activities, and are located close to each other (distance = 3.2 miles). The establishments are open 16 h a day, Monday to Friday, and 5 h on Saturdays. The data were collected using the Evo® Management software for Gym 1 and Tecnofit® software for Gym 2. The study included all clients enrolled between October 2013 and September 2019 at Gym 1, and between February 2018 and February 2020 at Gym 2.

STUDY SAMPLE

Participants who had their first registration in the system were included in the study. Thus, a total of 3802 clients were included: 2027 at Gym 1 (age= 39.1 ±13.1 years) and 1775 at Gym 2 (age= 36.8 ±11.6 years). The first record of attendance was considered as the entry and absence for one month as a dropout. Monitoring was carried out by controlling the biometric entry system using a turnstile. The gym software allows merging multiple entries on the day; therefore, it was considered for analysis only one entry per day. Participants were followed up for 12 months, or until dropout. If a participant who had dropped out returned to the gym during the follow-up period, the information from this new entry was not considered in the analysis aiming to avoid contamination of the results from these two observations of the same participant (Sperandei et al., 2016).

ASSESSMENT PROCEDURES

Using the software employed in this research we were able to extract information related to gender, age, month of enrollment, monthly attendance, contract length, and year of enrollment at the gym. For analysis purposes, the variables were stratified as follows: age (Gym 1: ≤32, 33-42 and ≥43 years; Gym 2: ≤31, 32-39 and ≥40 years), month of enrollment (January-March, April-June, July-September, and October-December), monthly attendance (≤3, between 4-6 and ≥7 times at both gyms), contract length (≤31; 32-186 and ≥187 days), and year of enrollment (Gym 1: 2013-2014, 2015-2016, and 2017-2018; Gym 2: 2018 and 2019. Monthly attendance was verified by the presence recorded during each month of the follow-up. As for contract length, it was determined by the difference between the beginning and the expiration of the membership contract. The year of enrollment was used in the adjusted model, as control of seasonality over the years.

STATISTICAL ANALYSIS

Descriptive analysis of the study sample was conducted using values of absolute and relative frequency. To verify the adherence rate over the course of 12 months, the survival curve was used employing the Kaplan-Meier method. For the association between the general characteristics of participants and the dropout rate, Poisson regression with a log-link function and a robust error variance was employed in the generalized linear model (GzLM). The results were expressed in prevalence ratio (PR) and 95% Wald confidence intervals (95% CI). The independent variables that showed a p-value <0.20 in the prevalence ratio (PR) in GzLM and no collinearity remained in the adjusted model. The Pearson's chi-squared test was used to check collinearity between the independent variables ($p<0.001$; Supplementary Material Tables 1 and 2). The goodness of fit of the model in GzLM was assessed by the following parameters of the Omnibus test: Likelihood Ratio χ^2 and $p<0.05$ (Supplementary Material Tables 3 and 4). A significance level of 5% ($p<0.05$) was adopted for the associations. Data analysis was performed using the SPSS 25.0 statistical software.

RESULTS

Figure 1 illustrates the adherence rate at Gym 1 and Gym 2 members over 12 months. A decline in adherence was observed over the months. In the first three months, more than half of the participants (54%) left Gym 1, and this percentage increased after 6 (70%) and 12 months (89%). As for gym 2, the curve shows that the probability of people dropping out in the first three months was 47%, and increased to 63 and 81% after six and 12 months, respectively.

Tables 1 and 2 outline the association between the general characteristics of participants and the dropout rate over 12 months both in gyms. It was found that being a female, aged ≥43, having a training frequency <7x/month, and enrollment between October and December were aspects associated with the dropout rate at Gym 1. As for Gym 2, participants with a training frequency <7x/month, contract length ≤31 days and between 32-186 days, and who enrolled at the gym from April to December presented greater chances of dropping out.

DISCUSSION

The present study focused on investigating the adherence rate and the risk factors for gym dropout over the course of a 12-month follow-up period in two medium-sized gyms. As one of the main findings, high dropout rates were observed both at Gym 1 (89%) and Gym 2 (81%) over the analyzed period. At both gyms, the chances of dropping out were higher among participants who attended the fitness center less than 7x/month, and who enrolled between October and December (Gym 1) and April and December (Gym 2). More specifically,
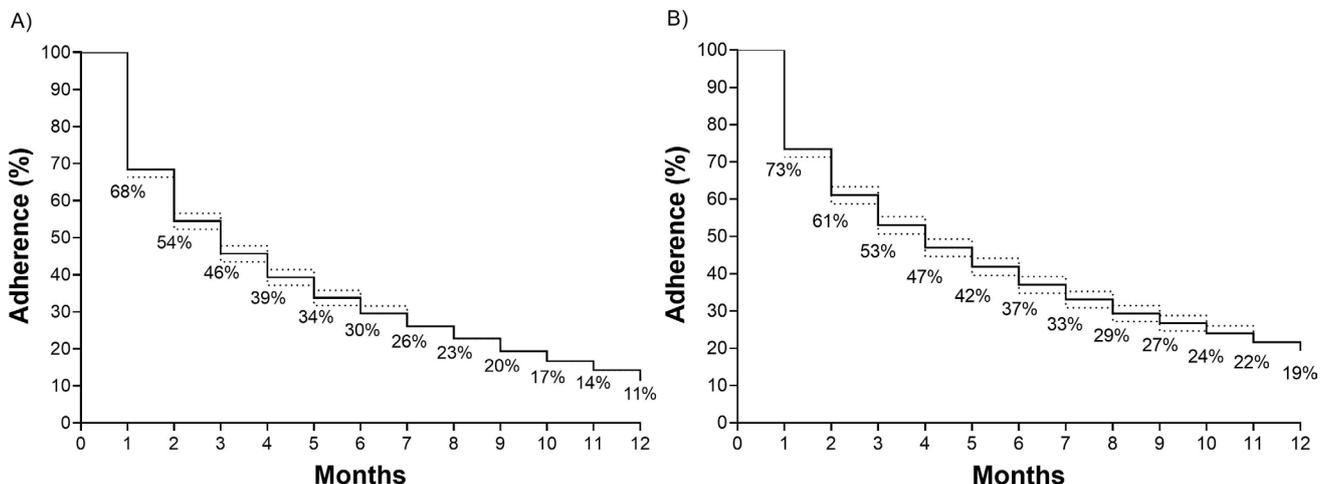

Figure 1. Adherence rate at Gym 1 (panel A) and Gym 2 (panel B) over 12 months. Dashed lines characterize the 95% confidence intervals.

Table 1. Association between general characteristics of participants who dropped out up to 12 months at Gym 1 (n = 2027).

	Dropout, n (%)	Model 1		Model 2		Model 3		Model 4		Model 5	
	Yes	PR (95% CI)	*P*-value	PR (95% CI)	*P*-value	PR (95% CI)	*P*-value	PR (95% CI)	*P*-value	PR (95% CI)	*P*-value
Gender		n = 2015		n = 1961		n = 1961		n = 2015		n = 2015	
Male	635 (86.6)	Ref.		Ref.		Ref.		Ref.		Ref.	
Female	1151 (89.8)	1.04 (1.00, 1.07)	**0.039**	1.04 (1.00, 1.07)	**0.031**	1.04 (1.00, 1.07)	**0.037**	1.03 (1.00, 1.06)	**0.061**	1.03 (1.00, 1.07)	**0.054**
Age		n = 1961									
≤32 years	590 (86.9)	Ref.		Ref.		Ref.					
33-42 year	559 (87.2)	1.00 (0.96, 1.05)	0.865	1.00 (0.96, 1.04)	0.975	1.00 (0.96, 1.05)	0.885				
≥43 years	586 (91.4)	1.05 (1.01, 1.09)	**0.008**	1.04 (1.01, 1.08)	**0.023**	1.05 (1.01, 1.09)	**0.009**				
Month of Enrollment		n = 2027									
January-March	575 (88.2)	Ref.		Ref.							
April-June	319 (86.7)	0.98 (0.94, 1.03)	0.490	0.98 (0.93, 1.03)	0.408						
July-September	279 (82.8)	0.94 (0.89, 0.99)	**0.028**	0.94 (0.89, 0.99)	**0.029**						
October-December	624 (93.1)	1.06 (1.02, 1.09)	**0.002**	1.06 (1.02, 1.09)	**0.003**						
Attendance		n = 2027									
≥ 7x/month	340 (67.3)	Ref.						Ref.			
4-6x/month	693 (91.8)	1.36 (1.28, 1.45)	**< 0.001**					1.36 (1.28, 1.45)	**< 0.001**		
≤ 3x/month	764 (99.6)	1.48 (1.39, 1.57)	**< 0.001**					1.48 (1.39, 1.57)	**< 0.001**		
Contract Length		n = 1933									
≥187 days	1474 (88.5)	Ref.									
32-186 day	98 (89.1)	1.01 (0.94, 1.08)	0.854								
≤ 31 days	140 (88.6)	1.00 (0.94, 1.06)	0.976								
Year of Enrollment		n = 2027									
2013-2014	826 (92.6)	Ref.								Ref.	
2015-2016	763 (83.7)	0.90 (0.87, 0.93)	**< 0.001**							0.90 (0.87, 0.93)	**< 0.001**
2017-2018	208 (93.3)	1.01 (0.97, 1.05)	0.722							1.00 (0.97, 1.05)	0.815

Values are expressed as an absolute and relative percentage, prevalence ratio (PR), and 95% confidence interval (95% CI); Model 1: unadjusted. Model 2: adjusted for gender, age, and month of enrollment. Model 3: adjusted for gender and age. Model 4: adjusted for gender and attendance. Model 5: adjusted for gender and year of enrollment. Bold values indicate significance at p < 0.05. n: sample size.

the predictive factors for dropout at Gym 1 were being female and aged >42 years. Meanwhile, for Gym 2, the factors involved contract length <31 days and between 32-186 days. These findings emphasize the problem of adherence to physical exercise programs and, at the same time, the potential risks of abandonment in a supervised space contribute to the specialized literature on the theme.

Our results show that a training frequency ≤3x/month increased the chances of dropping out by

48 and 92% at Gym 1 and Gym 2, respectively, while a frequency of 4-6x/month increased these chances by 36 and 63% at Gym 1 and Gym 2, respectively, over the course of 12 months. Garay et al. (2014) and Clavel San Emeterio et al. (2019) reported that a frequency >8x/month increased by 50 and 54% the chances of staying at the gym, respectively. Concurrently, a study found that 95% of beginners set a goal of attending the gym more than once a week; however, only 63% of them actually manage to reach this objective in the first month,

Table 2. Association between general characteristics of participants who dropped out up to 12 months at Gym 2 (n = 1775).

	Dropout, n (%)	Model 1		Model 2		Model 3		Model 4	
	Yes	PR (95% CI)	P-value	PR (95% CI)	P-value	PR (95% CI)	P-value	PR (95% CI)	P-value
Gender		n = 1775		n = 1545		n = 1545		n = 1436	
Male	598 (81)	Ref.							
Female	835 (80.5)	0.99 (0.95, 1.04)	0.788						
Age (n = 1545)		n = 1545							
≤31 years	435 (79.5)	Ref.		Ref.		Ref.			
32-39 year	411 (83)	1.04 (0.98, 1.11)	0.147	1.02 (0.97, 1.08)	0.438	1.04 (0.99, 1.11)	0.141	1.04 (0.98, 1.11)	0.237
≥40 years	390 (77.5)	0.97 (0.92, 1.04)	0.433	0.94 (0.89, 1.00)	**0.038**	0.98 (0.92, 1.04)	0.533	0.98 (0.92, 1.05)	0.616
Month of Enrollment		n = 1775							
January-March	765 (76)	Ref.				Ref.			
April-June	237 (90.5)	1.19 (1.13, 1.25)	**< 0.001**			1.17 (1.10, 1.24)	**< 0.001**		
July-September	247 (84.9)	1.12 (1.05, 1.19)	**< 0.001**			1.10 (1.03, 1.17)	**0.005**		
October-December	184 (85.6)	1.13 (1.06, 1.20)	**< 0.001**			1.11 (1.04, 1.20)	**0.004**		
Attendance		n = 1775							
≥7x/month	256 (51.3)	Ref.		Ref.					
4-6x/month	468 (83.9)	1.63 (1.49, 1.79)	**< 0.001**	1.61 (1.46, 1.77)	**< 0.001**				
≤3x/month	709 (98.7)	1.92 (1.77, 2.10)	**< 0.001**	1.90 (1.74, 2.07)	**< 0.001**				
Contract Length		n = 1619							
≥187 days	878 (75.5)	Ref.						Ref.	
32-186 day	114 (85.7)	1.14 (1.05, 1.23)	**0.001**					1.13 (1.04, 1.22)	**0.004**
≤31 days	285 (88.2)	1.17 (1.11, 1.23)	**< 0.001**					1.17 (1.11, 1.24)	**< 0.001**
Year of Enrollment		n = 2027							
2018	1280 (79.6)	Ref.						Ref.	
2019	153 (91.6)	1.15 (1.09, 1.21)	**< 0.001**					1.15 (1.08, 1.23)	**< 0.001**

Values are expressed as absolute and relative percentage, prevalence ratio (PR), and 95% confidence interval (95% CI); Model 1: unadjusted. Model 2: adjusted for age and attendance. Model 3: adjusted for age and month of enrollment. Model 4: adjusted for age, contract length, and year of enrollment. Bold values indicate significance at p < 0.05. n: sample size.

and only 34% in the third month (Carrera et al., 2018). It is worth mentioning that in the aforementioned study there was a monetary incentive for participants, which demonstrates the difficulty faced by individuals when trying to change their behavior regarding exercising. Thus, establishing tangible training frequency goals by providing the means for members to achieve an attendance >6x/month can favor adherence to physical activity. Another possibility is the creation of strategies that act on habit formation regarding the regular practice of physical exercises, such as the focus on pleasurable experiences, a consistent schedule, and a warm and comfortable environment (Kaushal and Rhodes, 2015), as an approach that uses motivational interviews and social involvement can improve adherence to physical activity at gyms (Schinkoeth and Antoniewicz, 2017). These strategies have increased the retention of gym members by up to 40% (Annesi, 2003).

Another relevant aspect found in the present study is related to gender, which was a predictor of dropout only at Gym 1, where women were more likely to drop out (4%) than men. This result differs from that found by Clavel San Emeterio et al. (2019), who reported that women were more likely (13%) to stay at the gym. Other investigations have not observed gender as a possible determinant for dropout at gyms (Hooker et al., 2016; Sperandei et al., 2016). Women are more motivated to control or decrease body weight and improve their body image (Al Kubaisy et al., 2017), and these motivations provide low adherence to physical exercise, especially in fitness centers (Sperandei et al., 2016).

This study also found that, only at Gym 1, participants aged >42 years presented a greater chance of dropping out compared with younger adults (<32 years). It was observed that individuals aged 25-80 years presented lower chances of meeting the recommendations for performing resistance/strength

exercises (31-68%) in comparison with younger adults (18-24 years old) (Bennie et al., 2018). These findings suggest that, with advancing age, individuals go less frequently to the gym and, consequently, have greater predisposition to abandon the physical exercise. Other studies have reported lower predisposition to drop out among individuals aged >35 years compared with younger adults (<25 years) (Clavel San Emeterio et al., 2019; Sperandei et al., 2016). A study speculated that financial stability among older people may guarantee their longer retention at the gym, unlike young people (Sperandei et al., 2016).

Another relevant finding addressed in the present study is the influence of contract length on dropout rate. It should be noted that the contract length is a representation of the strength of the participant's intention. At gym 2, we observed that memberships of up to 31 (i.e., monthly contract) and 186 days (i.e., semiannual contract) increased the chances of dropping out by 17 and 14%, respectively. A study followed 2094 customers over 20 months and found that payment by installments in 6x (bimonthly membership) increased the permanence of individuals at the gym compared with cash payments (monthly membership) and 3x installments (quarterly membership) (Porto and Silva, 2013). Analyzed together, these results reinforce that longer membership contracts (higher strength of intention) increase the adherence to fitness training gyms. It is worth mentioning that with the offer of different membership lengths (i.e., quarterly, semiannual, or annual), the financial cost of gym members also increases. Additionally, it allows customer to obtain discounts, which can be appealing for creating a bond to the gym. The monthly investment (BRL) between the gyms is different (Gym 1: mean = 336.2, SD = 256.4; Gym 2 mean = 168.4, SD = 157.1, data not shown), and corroborates the average nominal monthly income of people living in the neighborhood close to the assessed gyms (Gym 1: 6.5 minimum wages (Natal, 2017a); Gym 2: 4.4 minimum wages (Natal, 2017b), based on information from the Brazilian Institute of Geography and Statistics (IBGE). Considering financial costs, a recent study found that a higher monthly expenditure (i.e., >42 EUR) reduces the chances of dropout over 12 months by approximately 50% (Clavel San Emeterio et al., 2019).

Finally, the present study identified that the month of enrollment at the gym can be a dropout predictor. At gym 1, participants who enrolled between October and December were more likely to dropout (6%), whereas enrollment from April to June (19%), July to September (12%), and October to December favored the dropout rate (13%) compared with that from January to March. This seasonality can be attributed to certain times of the year and holidays with longer intervals. In this respect, a study observed that the greatest engagement in physical activities at gyms occurs in the winter/fall period, while outdoor activities are more prominent during summer and spring (Dunton et al., 2008). A different study reported that the peak of physical activity is observed during spring and summer; however, location of the exercises was not reported (Ma et al., 2006). Based on our results, it seems that enrolling during the summer months (January-March) can contribute to maintaining adherence to physical activity for 12 months; in contrast, enrolling during the fall, winter, and spring (April-December) may favor dropout. Furthermore, considering holidays with long intervals, a study found a 12% drop in gym attendance after Easter (April), with this behavior continuing to decline steadily during the subsequent weeks (Fredslund and Leppin, 2019). Therefore, it seems that these factors (e.g., seasons and holidays with longer intervals) can weaken the decision of going to the gym, which can explain the seasonality observed in this study.

The robustness of our study is explained by the use of the attendance record as an adherence indicator and data stratification (such as frequency, adherence and dropout rate at the gyms), which improve information about the temporal dynamics of behavior when exercising. Assessing these aspects is vital for guiding the conduct, strategies, and performance of employees and administrative and management personnel of a gym. The different profiles analyzed according to certain specific characteristics such as gender, age, monthly attendance, contract length, and month of enrollment can contribute to suggesting assertive mechanisms for professional performance, thus decreasing the dropout rate. It is noteworthy that the present study has limitations specially regarding the collection of information on physical, psychological, and mental health indicators during the analyzed period, considering the possible influence of these indicators in maintaining the practice of physical activities (Hooker et al., 2016; Sperandei et al., 2016). In addition, although this study presents factors associated with dropout, it does not present a comprehensive analysis of the reasons why members actually drop out.

CONCLUSIONS

The results indicate that the dropout rate at gyms is high, since we observed that more than 80% of the study participants left the gym within one year after enrollment. The main dropout profile in this research included the following characteristics: being a female, aged >42 years, having an average monthly frequency <7 times, contracting monthly and half-yearly memberships, and enrolling to the gym as of April. It is worth mentioning that the analyzed variables differently impacted dropout in the two gyms analyzed. Therefore, our findings reinforce the need to develop strategies that consider these individual characteristics, thus enabling reduction of the dropout rate in these health promotion spaces.

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Supplementary Material

Supplementary material accompanies this paper.

Supplementary Table 1. Bivariate analysis to test collinearity between independent variables using the Pearson's chi-squared test (Gym 1, n = 2027)

Supplementary Table 2. Bivariate analysis to test collinearity between independent variables using the Pearson's chi-squared test (Gym 2, n = 1775)

Supplementary Table 3. Model fit (Omnibus test) at Gym 1 using the generalized linear model.

Supplementary Table 4. Model fit (Omnibus test) at Gym 2 using the generalized linear model.

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