Identifying groups at risk for 1-year membership termination from a fitness center at enrollment

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ABSTRACT

The vast majority of Americans do not engage in adequate regular physical activity despite its well-known health benefits. Even when individuals attempt to become more active by joining a fitness center, estimates suggest that nearly half terminate their membership within the first 6 months. A better understanding of who is at risk for early membership termination upon joining may help researchers develop targeted interventions to improve the likelihood that individuals will successfully maintain memberships and physical activity. This study's purpose was to identify, based on a wellness assessment (WA) used in fitness centers, individuals at risk for fitness membership termination prior to 1-year. Center members ($N = 441$; $M_{age} = 41.9$, $SD = 13.1$; 74.4% female) completed a comprehensive WA of stress, life satisfaction, physical fitness, metabolic health, and sleep quality at the beginning of their memberships and were followed for one year. Latent class analyses utilized the WA to identify four groups: (a) healthy, (b) unhealthy, (c) poor psychological wellness, and (d) poor physical wellness. Participants in the poor psychological wellness group ($OR = 2.24$, $p = 0.007$) and the unhealthy group ($OR = 2.40$, $p = 0.037$) were significantly more likely to terminate their memberships at 1-year as compared to the healthy group. Participants with poor physical wellness visited the fitness center less frequently than healthy participants ($p < 0.01$). Results suggest that poor psychological wellness is a risk factor for terminating memberships, whereas poor physical wellness is not. Future studies should replicate these latent classes and develop targeted interventions to address psychological wellness as a method to improve fitness membership retention.

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1. Introduction

Promoting physical activity is a major public health priority due to the well-documented health benefits associated with regular physical activity (Koh, 2010). The American College of Sports Medicine (ACSM) recommends a minimum of 150 min of moderate exercise or 75 min of vigorous exercise each week (Adabonyan et al., 2010). Despite the widely acknowledged benefits of regular physical activity, estimates from national self-report surveys indicate that only 45% to 65% of the US population meets the ACSM guidelines, and when measured objectively via accelerometer assessment, only 5% meet recommended guidelines (Troiano et al., 2008).

One marker of physical activity engagement is fitness center membership. There are approximately 183,900 fitness centers worldwide with 144.7 million members, bringing in approximately $84 billion (USD) in revenue annually (International Health, Racquet, and Sportsclub Association, 2015). Fitness center members engage in more health behaviors, including physical activity, and demonstrate greater health responsibility than individuals who are not members of a fitness center (Ready et al., 2005). Nevertheless, more than half of individuals who join a fitness center discontinue their activity within the first three months (Sperandei et al., 2016). Physical activity and dietary modification interventions demonstrate similarly high levels of attrition (Blue and Black, 2005). Individuals who join a fitness center are, at least initially, motivated to engage in physical activity; yet the high drop-out rate indicates that maintaining an active lifestyle is challenging even for motivated individuals. However, determining the factors that predict continued fitness center membership may provide important insight into who is able to maintain exercise routines. Additionally, pinpointing early predictors of fitness center membership termination may help identify "at-risk members" who may need additional support or intervention in order to sustain their efforts to engage in physical activity.

Abbreviation: WA, wellness assessment.
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Much has been published on the general determinants of physical activity maintenance (Amireault et al., 2013); however, the majority of this work has been done in the context of physical activity intervention research. Fitness center members may be a distinct population (e.g., fitness members pay monthly dues rather than receive financial compensation for study participation) who engage in physical activity in unsupervised and unstructured settings. Research examining predictors of fitness center membership termination in a real-world environment, and using measures commonly administered at fitness centers, is sparse. Evidence suggests that individuals with higher body mass index (BMI), who are previously physically inactive, and are motivated to lose weight rather than to improve health are more likely to terminate their memberships (Sperandei et al., 2016). Other research has shown that social cognitive predictors (i.e., self-efficacy, outcome expectancies, barriers, and facilitators) are significant predictors of fitness center visits (Jekauc et al., 2015). To our knowledge, there have not been any additional peer-reviewed studies examining this important area. Potential predictors of fitness center membership termination, such as stress, sleep, and physical fitness, have yet to be explored. Thus, there is a very large research gap examining predictors of retention at fitness centers. These factors have practical utility because they are commonly assessed at fitness centers. Furthermore, an analytic approach that is person-centered, examining how combinations of these variables cluster in individuals, may further pinpoint individuals at-risk for membership termination and in greatest need of early intervention (Neely-Barnes, 2010).

This study's purpose was to examine the degree that psychological (stress, life satisfaction), behavioral (sleep quality), and physical (physical fitness, metabolic health) dimensions of wellness predicted number of fitness center visits and membership termination 1-year after initial enrollment at a fitness center. This study took a person-centered approach (i.e., using latent class analysis) to examine how dimensions of wellness predicted visits and membership termination. The specific research questions were: (1) Can participants be classified into groups based on their scores on the individual wellness dimensions?; (2) Do the resulting groups predict membership termination at 1-year post enrollment?; and (3) Are the resulting groups related to frequency of fitness center visits during the first year? Given the lack of research in this area, specific hypotheses were kept general. The hypotheses were that (1) latent groups would emerge; (2) latent groups would differentially predict membership termination at 1-year; and (3) group membership would be related to frequency of fitness center visits.

2. Method

2.1. Site

This study was conducted at a university-affiliated health and wellness fitness center that offers a range of wellness services to members, focusing on a broad conceptualization of wellness that includes physical fitness and metabolic health, as well as psychological and behavioral wellness. (For clarity purposes, the wellness center will be referred to as fitness center throughout the remainder of this article). Membership includes unlimited access to the fitness center as well as access to a variety of exercise classes. At enrollment, members were invited to complete a comprehensive wellness assessment (WA) that covers five dimensions of wellness and includes a 90-min visit with a personal trainer, during which body composition, physical fitness, and metabolic health were assessed.

2.2. Participants

Participants were fitness center members who joined between April and December 2012 and completed the WA. During this time, 2359 individuals between the ages of 18 and 89 joined the center. Of those, 1692 members (71.7%) completed at least part of the wellness survey

and fitness assessment within ± 30 days of joining and, of these, 441 members (18.7%) completed the entire WA. Data comparing these groups are found below. Due to the large influx of members at the fitness center's initial opening in April 2012 (approximately 1200 in the first month), it was logistically difficult to have all new members complete the WA in the first 30 days. In the first year after opening, the WA was offered as a free incentive to join the fitness center (a $150 value).

2.3. Procedure

Participants who joined the center were invited to complete the WA and upon completion, members were given a Wellness Report, which provided a "wellness score." This study was approved by the Institutional Review Board to conduct a retrospective cohort analysis. De-identified wellness report and membership data were pulled in December 2013.

2.4. Measures

2.4.1. Termination

Termination status was determined as whether or not individuals were still members at one year after they enrolled.

2.4.2. Visits

Members swiped a membership card every time they entered the fitness center. Visits were electronically recorded and stored in the membership database. The sum of visits over the first year was used in analyses.

2.4.3. Wellness

The WA included five dimensions of wellness: life satisfaction, stress, sleep quality, physical fitness, and metabolic health. Each dimension consisted of an evidence-based measure(s) and was standardized on a scale ranging from 0 (very poor wellness) to 100 (maximum wellness).

2.4.4. Life satisfaction

Life satisfaction was measured using the standardized average of two scales: (1) the Satisfaction with Life Scale (SWLS; Diener et al., 1985), and (2) the Quality of Life Scale (QOLS; Burckhardt et al., 1989). Participants rated their agreement with five statements (e.g., "I am satisfied with my life.") on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). On the 16-item QOLS, participants rated their satisfaction with 16 dimensions of life (e.g., work, close friends, health, etc.) on a 7-point scale ranging from 1 (terrible) to 7 (delighted). The internal consistency of the two scales together was very high ($\alpha = 0.92$).

2.4.5. Stress

Stress was measured using the 14-item stress subscale of the Depression Anxiety Stress Scales–42 (DASS-42; Lovibond and Lovibond, 1995). This subscale assessed chronic, non-specific arousal such as difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive, and impatient. Individuals rated the extent to which they experienced each state over the past week on a 4-point scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Items were summed for a total score and then reversed for the standardized score so that higher scores corresponded to lower stress. Internal consistency was very high ($\alpha = 0.90$).

2.4.6. Sleep quality

The Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989) was used to measure sleep quality. The 10-item PSQI assessed seven dimensions of sleep quality: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction over the last month. Each dimension was scored on a 0 (no problem) to 3 (significant sleeping problem)

scale and the seven dimensions were summed for an overall sleep quality score. The scale directionality was reversed so that higher scores corresponded to better sleep quality. Internal consistency of the measure was acceptable ($\alpha = 0.68$).

2.4.7. Physical fitness

Physical fitness was measured using three tests: grip strength (Takei Hand Grip Dynamometer A5401; Takei Scientific Instruments, Tokyo, Japan), aerobic fitness (Young Men's Christian Association [YMCA] step test; Golding, 2000), and flexibility (sit-and-reach test; Holt et al., 1999). Certified personal trainers conducted each fitness test. Scores were normed based on age and gender, standardized on 0–100 point scales, and averaged to determine members' overall physical fitness.

2.4.8. Metabolic health

Metabolic health was measured using several tests, including: body fat percentage, BMI, systolic and diastolic blood pressure, hemoglobin A1C (HbA1C), high density lipoproteins (HDL), and non-high density lipoproteins (non-HDL). Body fat percentage was measured using an OMRON Fat Loss Monitor HBF-306C bioelectric impedance analysis tool (Omron Healthcare, Inc., Lake Forest, IL). Blood pressure was measured using an OMRON HEM-7783 vital signs monitor (Omron Healthcare, Inc., Lake Forest, IL). HDL, non-HDL, and HbA1C were measured from blood taken from a finger prick. Blood samples were immediately processed using Alere Afinion HbA1C 1115015 Tests and Alere Cholestech LDX system-Lipid Profile 10–989 Tests (Alere Inc., Waltham, MA). Results were scored based on age and gender, standardized on the 0–100 point scale, and averaged for a total metabolic health score.

2.4.9. Statistical analyses

SAS version 9.4 software (SAS Institute, Inc., 2015) was used to calculate all descriptive statistics and regression analyses. Descriptive statistics were calculated for outcomes and predictors of interest. Independent samples t-tests and χ^2 analyses were used to examine differences between the complete case sample included in the analysis and the entire sample of members who joined between April and December 2012 and between males and females. Pearson bivariate correlations among the five wellness dimensions were calculated to examine patterns in the data.

The person-centered approach employed M*plus* 7.4 software (Muthén and Muthén, 2015) to estimate latent class analysis (LCA) models with 2–5 classes using the five wellness dimensions as indicators of class membership. Fit indices and interpretability of solutions were considered. The Akaike Information Criterion (AIC; Akaike, 1973), the Bayesian Information Criterion (BIC; Schwarz, 1978), and the sample size adjusted Bayesian Information Criterion (adjusted BIC; Sclove, 1987) were considered with lower values indicating better fit. The Lo-Mendell-Rubin (L-M-R) statistic (Lo et al., 2001) tested whether a model with k classes fit better than a model with k-1 classes. A significant p-value supports choosing the model with a greater number of classes. The entropy statistic, which is a measure of classification quality, was also considered; values closer to 1 indicate high classification accuracy. After deciding on the best fitting solution, participants' estimated class membership from that solution was used as a predictor of membership termination at 1-year via a logistic regression model controlling for age, gender, and student status. Student status was used as a covariate because students paid a lesser fee than staff and community members, and they were considered to be more transient than other member types. Finally, multiple linear regression models were used to predict the number of fitness center visits during the year (controlling for age, gender, student status, and membership length) by class membership.

3. Results

Members in the final, complete, data set were statistically more likely to be female ($p = 0.002$; 74.4% vs. 65.0%), non-students ($p < 0.0001$;

73.2% vs. 60.4%), and older ($p < 0.0001$; 41.9 yrs vs. 37.9 yrs), than members who did not complete the entire assessment. Members in the final data set were also less likely to terminate their memberships in the first year compared to members lacking complete data, $\chi^2(1) = 21.8$, $p < 0.0001$; 24.0% vs. 35.7%. Membership termination was not significantly related to gender, $\chi^2(1) = 0.8$, $p = 0.38$; however, those who terminated were significantly younger ($M = 37.5$ yrs., $SD = 12.3$ yrs. vs. 39.2 yrs., $SD = 12.7$ yrs.), $t(2357) = 3.24$, $p = 0.0012$, and were significantly less likely to be students (33.5% vs. 39.0%), $\chi^2(1) = 6.7$, $p = 0.0096$, than those who did not terminate. Students ($M = 54.3$, $SD = 40.7$) visited the fitness center less frequently than non-students ($M = 64.8$, $SD = 51.4$, $t[261] = 2.24$, $p = 0.02$).

Males and females significantly differed on physical dimensions of wellness, including metabolic health, $t(439) = 2.09$, $p = 0.036$, and physical fitness, $t(439) = 2.60$, $p = 0.0097$. Females had better metabolic health ($M = 76.3$, $SD = 20.0$ vs. $M = 71.9$, $SD = 18.3$) and physical fitness ($M = 55.0$, $SD = 19.8$ vs. $M = 49.4$, $SD = 20.1$) than males. Males ($M = 40.8$, $SD = 14.0$, range 20–82) and females ($M = 42.3$, $SD = 12.8$, range 18–71) did not significantly differ on age, $t(439) = 1.08$, $p = 0.27$. Correlations among the five wellness dimensions are presented in Table 1. Notably, two wellness dimensions (stress and life satisfaction) were significantly correlated with termination at 1-year, i.e., those who reported higher stress or lower life satisfaction were more likely to terminate their memberships.

3.1. Participant classes

Based on the overall fit statistics and interpretability of the solutions, the 4-class LCA demonstrated the best fit for the data (see Table 2). Table 3 presents descriptive statistics for the entire sample and for the four-class solution, and Fig. 1 is a graphical representation of the five wellness dimension averages for each of the 4 classes. For all five dimensions, higher scores indicate better wellness; however, scores should not be compared across domains. The first class comprised approximately 56% of the sample and was "healthy" across all five wellness dimensions. The second class, comprising 20% of the sample, was named the "poor physical wellness" class. They demonstrated good psychological and behavioral wellness: low stress levels, high life satisfaction, and average sleep quality, but they also demonstrated poorer than average physical fitness and metabolic health. In contrast, the third class (approximately 7% of the sample) had the poorest wellness scores across all five dimensions, and was named the "unhealthy" class. They had the highest stress levels and the poorest life satisfaction, sleep quality, physical fitness, and metabolic health scores. The fourth class, named "poor psychological wellness," comprised approximately 17% of the sample and was characterized by higher than average stress, lower than average life satisfaction and sleep quality, but average physical fitness, and greater than average metabolic health.

3.2. Classes predicting membership termination and fitness center visits

Members were categorized into one of the four classes, and then class assignment was used to predict termination at 1-year, controlling for age, gender, and student status. Overall, class status significantly added to the model predicting termination, χ^2 difference$(3) = 9.53$, $p = 0.023$ (see Table 4). Using the healthy class as the reference group, members in the "poor psychological wellness" class were 2.24 times more likely to terminate their memberships at 1-year compared to the healthy class. The "unhealthy" class was 2.40 times more likely than the healthy class to terminate their memberships at 1-year. The "poor physical wellness" class was not significantly more likely to terminate their memberships than the "healthy" group. Logistic regression models with different reference groups were conducted to examine differences among the four classes. No other significant group differences were found.

Table 1
Descriptive statistics of total sample and correlations among study variables.

Variable	1	2	3	4	5	6	7	8	9
1. Age	–								
2. Female	0.05	–							
3. Student	−0.55***	−0.07	–						
4. Terminated at 1 year	−0.06	−0.02	−0.06	–					
5. Stress	0.06	−0.08	0.01	−0.12*	–				
6. Life satisfaction	−0.11*	−0.07	0.15**	−0.10*	0.40***	–			
7. Sleep quality	−0.06	−0.05	0.08	−0.05	0.37***	0.39***	–		
8. Physical fitness	−0.19***	0.12**	0.10*	−0.02	0.05	0.12*	0.13**	–	
9. Metabolic health	−0.19***	0.09*	0.12*	−0.03	0.04	0.07	0.10*	0.28***	–
10. Fitness center visits	0.07	−0.01	−0.09	−0.33***	0.09	0.04	0.07	0.12*	0.11*

Note. Data are Pearson bivariate correlations. Higher scores on scales 5–9 correspond to greater wellness.
*** $p < 0.0001$.
** $p < 0.01$.
* $p < 0.05$.

To further explore the relationship between class and fitness center utilization, class membership was used to predict the number of visits to the fitness center over the course of one year. Controlling for age, gender, and student status, participants in the poor physical wellness class, $b = -17.68$, $SE = 6.10$, $p = 0.004$, and in the unhealthy class, $b = -20.11$, $SE = 9.35$, $p = 0.032$, had significantly fewer visits to the fitness center than participants in the healthy class. Participants in the poor psychological wellness class did not visit the fitness center significantly fewer times than the healthy class, $b = -8.42$, $SE = 6.44$, $p = 0.192$. An additional model controlled for membership length. Membership length significantly predicted number of visits, $b = 0.21$, $SE = 0.03$, $p < = 0.0001$. Participants in the poor physical wellness class were still visiting the fitness center significantly less frequently than participants in the healthy class ($p = 0.0021$), but the participants in the unhealthy class were no longer visiting the fitness center significantly less frequently ($b = -15.13$, $SE = 8.93$, $p = 0.09$).

4. Discussion

This study aimed to predict membership termination at 1-year and visits at a fitness center using five distinct dimensions of wellness (stress, life satisfaction, sleep quality, physical fitness, and metabolic health) that are commonly measured in these environments. Based on a person-centered analytical approach, four classes of members emerged: a healthy class across all five wellness dimensions; an unhealthy class across all five wellness dimensions; a poor psychological wellness class; and a poor physical wellness class. The poor psychological wellness and the unhealthy class were more likely to terminate their memberships at 1-year compared to the healthy group. In contrast, participants in the poor physical wellness and unhealthy groups visited the fitness center less frequently than participants in the healthy group. Given the limited existing research in this area, establishing the association between latent class and membership termination is an important contribution which we hope will encourage more work in this area.

A person-centered analytical approach identifies individuals who are at increased risk; identifying individuals at high-risk for dropout at the beginning of membership is key to retaining members and encouraging long-term maintenance of healthy behavior (Mullen et al., 2013).

The multivariate approach utilized here captures real-world phenomena that coexist in identifiable ways. It has potential to go beyond identification of single risk variables to identify individuals at risk for termination and suggests possible intervention strategies. In this study, we identified two classes that may be at greater risk for termination: the poor psychological wellness and the unhealthy classes. Both are characterized by greater stress and poor life satisfaction. Though there is limited research in this area, there is some evidence that psychological stress negatively predicts physical activity maintenance. Individuals with more life stress are more likely to be irregular exercisers (Jekauc et al., 2015), and those that are starting exercise programs have more difficulty maintaining exercise when they are experiencing stress, whereas individuals who are long-time exercisers may respond to stress with greater exercise participation (Clark et al., 2011; Lutz et al., 2010). Increased stress and decreased life satisfaction may overwhelm coping resources reducing self-regulation capacity and consequently leading to early termination (e.g., Fields et al., 2014). One might speculate that given their average to above average levels of physical and metabolic wellness, their physical fitness may be less of a priority than their mental health so they would be more likely to cancel their memberships if their mental health needs were not being met.

This finding highlights an area where fitness centers may expand their programming. Fitness centers that include more comprehensive wellness programs may be more prepared to address members' psychological health. For example, fitness centers could hold stress management groups (e.g., addressing cognitive-behavioral stress management techniques, relaxation strategies, or meditation classes) or psychological wellness workshops (e.g., values clarification and goal setting, finding balance) that may not only improve members' psychological health but also their likelihood to maintain their memberships. Addressing psychological wellness may be key to retaining members over the longer-term. Clearly more research is necessary to better understand the complex interplay between and among predictors of wellness membership termination, but sophisticated multivariate approaches will yield increasingly precise information. Future research investigating the role of self-regulation in light of these findings is also indicated.

In contrast, we found that individuals who were in the unhealthy or poor physical wellness class visited the fitness center less frequently

Table 2
Model comparisons, fit indices, and class proportions for latent class analysis models.

No. of classes	Log likelihood	No. of estimated parameters	AIC	BIC	Adjusted BIC	L-M-R p	Entropy	Class proportions
2	−9321.54	16	18,675.08	18,740.51	18,689.73	0.00	0.80	0.22, 0.78
3	−9300.00	22	18,644.01	18,733.97	18,664.97	0.33	0.84	0.16, 0.08, 0.76
4	**−9266.17**	**28**	**18,588.35**	**18,702.84**	**18,613.98**	**0.02**	**0.79**	**0.56, 0.20, 0.07, 0.17**
5	−9248.95	34	18,565.91	18,704.93	18,597.03	0.17	0.80	0.08, 0.06, 0.54, 0.20, 0.12

Note. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; L-M-R = Lo-Mendell-Rubin. Boldface represents the best fitting model.

Table 3
Descriptive statistics of the final 4 class solution.

Variable	Total sample N = 441	Healthy n = 248	Poor physical n = 88	Unhealthy n = 31	Poor psych n = 74
	n (%)				
Female	328 (74.4%)	185 (75.2%)	58 (65.9%)	22 (75.9%)	63 (80.8%)
Student	118 (26.8%)	83 (33.7%)	17 (19.3%)	2 (6.9%)	16 (20.5%)
Terminated at 1 year	106 (24.0%)	47 (19.1%)	23 (26.1%)	10 (34.5%)	26 (33.3%)
	M [±SD]				
Age	41.9 [±13.1]	40.0 [±13.4]	45.7 [±12.8]	46.5 [±11.3]	42.0 [±12.1]
Stress	77.4 [±16.2]	82.8 [±13.2]	82.3 [±13.2]	57.8 [±13.2]	62.5 [±15.5]
Life satisfaction	68.8 [±15.4]	75.0 [±11.7]	73.2 [±11.7]	48.7 [±11.7]	52.3 [±12.5]
Sleep quality	67.1 [±16.7]	72.5 [±13.6]	71.6 [±13.6]	40.3 [±13.6]	55.5 [±14.2]
Physical fitness	53.5 [±20.0]	59.0 [±18.7]	45.4 [±18.7]	36.2 [±18.7]	52.9 [±18.9]
Metabolic health	75.2 [±19.7]	84.7 [±12.1]	50.2 [±12.1]	49.1 [±12.1]	84.7 [±11.4]
Fitness center visits	62.0 [±48.9]	67.4 [±51.9]	52.2 [±46.0]	51.5 [±41.9]	60.3 [±42.4]

Note. Data are represented as M [±SD] for continuous data and as n (%) for categorical data.

than members in the healthy class. After controlling for length of membership, participants in the unhealthy class were not statistically different from the healthy class, but were still visiting the fitness center on average 15 times less per year. This may be because engaging in exercise brings about more negative affect for those who are not physically fit (Boutcher et al., 1997), and they may not be inherently reinforced to engage in physical activity. Conversely, given their poor physical fitness, one may suspect that these individuals also engaged in less physical activity prior to joining the fitness center and may not maintain a high level of physical activity after joining the fitness center. However, the individuals in the poor physical wellness group were not more likely to cancel their memberships, suggesting that they maintain a chronically lower level of physical activity without discontinuing their usage.

Previous evidence suggests that >50% of new exercisers quit within the first three months of joining a fitness center (Sperandei et al., 2016). The termination rates were much lower in this study, possibly a function of the location of the fitness center (affiliation with a university). Nevertheless, in this group, individuals with greater stress and lower life satisfaction were still more likely to terminate their memberships.

Individuals who completed the entire WA were less likely to terminate their memberships at 1-year than individuals who did not complete the WA. Though we cannot offer a definitive explanation for this finding, it seems that commitment may be involved; either the participants who take the WA are more committed a priori or perhaps taking the entire WA serves to increase their level of commitment in ways

similar to other psychological research that shows that behavior can sometimes predict attitude or volitional state. It is not clear from our results whether requiring all members to complete the WA would decrease early terminations. A study properly designed to address this question would contribute to the literature.

4.1. Strengths and limitations

This study has several strengths. The WA is similar to measures commonly employed in wellness and fitness centers. The instruments that measured the wellness dimensions are well supported and widely used in the literature. Moreover, several non-self-report measures of physical fitness and metabolic health were included. Members were followed for one year, which allowed ample time to determine whether they would maintain their memberships.

This study also has several limitations. Data were collected during the first year of fitness center operation. There may be something qualitatively different about members who joined immediately, though one might suspect that their enthusiasm toward center engagement might be quite high. There were also many members who were missing complete fitness assessments in the first 30 days of their memberships, mainly because of the large influx of new members at center opening. The proportion of "unhealthy" individuals in this sample was also relatively small (7%) and the majority of individuals were classified in the "healthy" group (56%). It may be possible that members who believed they were more "well" were more likely to complete the WA. Consequently, it is possible that in the membership as a whole, there could be a greater proportion of "unhealthy" members though it is also possible that those who believe themselves to be healthier are the ones actually attracted to fitness center membership. Additionally, data on previous fitness center participation or subsequent fitness center enrollment (post termination) were not collected. It may be that some individuals routinely switched fitness centers but were regularly physically active. The primary outcomes of this study were membership termination and fitness center visits, which do not equate to exercise behavior or physical activity. For example, members may continue to
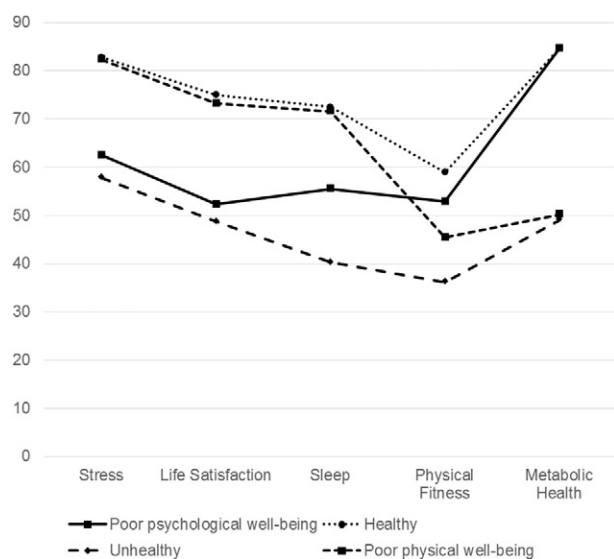

Fig. 1. Estimates of averages of each wellness dimension for the each of the 4 Classes. *Note.* Higher scores indicated better wellness on all five dimensions.

Table 4
Classes predicting termination at 1-year.

Predictor	Wald	p	OR	95% CI
Age	6.59	0.010	0.97	0.952, 0.993
Female	0.37	0.544	0.85	0.514, 1.421
Student	4.73	0.029	0.50	0.269, 0.934
Class				
Healthy	REF	–	–	–
Poor physical	1.11	0.292	1.38	0.759, 2.509
Unhealthy	4.33	0.037	2.40	1.053, 5.480
Poor psychological	7.41	0.007	2.24	1.254, 4.012

Note. OR = odds ratio; CI = confidence interval.

pay for memberships without using the facility, and members who terminate their memberships may be exercising in other settings. Thus, a study examining the relationships of wellness dimensions to exercise and physical activity adoption, maintenance, and behavior, is needed. Finally, it would also be helpful to include objective measures of behaviors, including physical activity and sleep, given the potential validity concerns of self-reported behaviors (Troiano et al., 2011). Thus, an interesting study would examine class differences based on perceptions of healthy behaviors versus objective measures of health behaviors.

4.2. Future directions

There are several future directions to consider. A first step would be to replicate the study in other centers using the same measures to determine whether the latent classes can be cross-center replicated. Moreover, it would be interesting to further explore which activities (e.g., classes, swimming, elliptical) that members engage in while at the fitness center, and how these activities relate to class membership as well as to membership retention and frequency of visits to the fitness center. A second step is to develop fitness center-based interventions to increase life satisfaction and decrease stress for those individuals who matched the profile of the poor psychological wellness group (i.e. low in life satisfaction and high in stress) and the unhealthy group. Improvements in this area may increase membership retention. Additionally, future studies could further examine the role that completing a comprehensive WA plays in retention by utilizing research designs addressing this question.

5. Conclusions

This study used a person-centered analytical approach to identify individuals at increased risk of membership termination. Those with poor psychological wellness (increased stress and lower life satisfaction) were more likely to terminate memberships at 1-year post-enrollment. Future studies should capitalize on these findings and investigate their generalizability as well as ways to beneficially intervene to increase retention.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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