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Original Article

BARRIERS AND FACILITATORS FOR ADHERENCE TO FUNCTIONAL TRAINING AND ENDURANCE TRAINING FOCUSED ON WEIGHT LOSS

BARREIRAS E FACILITADORES PARA ADESÃO AO TREINO FUNCIONAL E TREINO DE RESISTÊNCIA FOCADO NA PERDA DE PESO

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RESUMO

Investigamos as percepções sobre barreiras e facilitadores para adesão ao treinamento funcional de alta intensidade (HIFT) e treinamento de resistência (TE) em um programa de perda de peso. Os dados foram coletados em grupos focais e foi utilizado o IRAMUTEQ® para processamento e análise estatística a partir da Classificação Hierárquica Descendente (CHD) e Nuvem de Palavras. Foi realizada técnica de análise de conteúdo. Participaram 106 adultos com excesso de peso, dos quais 28 voluntários foram inseridos em grupos focais (67,9% do sexo feminino; 32 ± 9,38 anos e índice de massa corporal de 31,73 ± 3,64 kg/m²). Os facilitadores comuns para a adesão ao treinamento foram a rede de apoio, os benefícios de saúde e bem-estar, o aspecto social do exercício, a autoeficácia e a prática no mesmo local de trabalho e/ou estudo. As barreiras comuns foram adaptação precoce, dores corporais e falta de tempo. O HIFT foi caracterizado como mais simples e dinâmico. Porém, devido à impossibilidade de inclusão na rotina, muitos participantes destacaram preferência por treinos de resistência nos finais de semana. Nosso estudo sugere que a rede de apoio, os exercícios em grupo e os benefícios à saúde e ao bem-estar são determinantes importantes para a adesão às rotinas de treinamento físico de adultos com excesso de peso. As futuras intervenções para manutenção e/ou perda de peso devem concentrar-se em modelos eficazes para maximizar as chances de sucesso.

Palavras-chave: Exercício; Grupos focais; Perda de peso; Treinamento aeróbico; Treinamento Funcional de Alta Intensidade.

ABSTRACT

We investigated the perceptions of barriers and facilitators for adherence to high-intensity functional training (HIFT) and endurance training (ET) in a weight loss program. Data were collected in focus groups and the IRAMUTEQ® was used for statistical processing and analysis from the Descending Hierarchical Classification (DHC) and a Word Cloud. Content analysis technique was performed. One hundred six overweight adults participated, in which 28 volunteers were inserted into focus groups (67.9% female; 32 ± 9.38 years, and body mass index of 31.73 ± 3.64 kg/m²). Common facilitators for adherence to training were the support network, health and well-being benefits, the social aspect of exercise, self-efficacy, and practice in the same workplace and/or study. The common barriers were early adaptation, bodily pain, and lack of time. HIFT was characterized as simpler and more dynamic. However, due to the impossibility of inclusion in the routine, many participants highlighted a preference for endurance training on weekends. Our study suggests that the support network, group exercises and health and well-being benefits are important determinants for the adherence to physical training routines for overweight adults. Future interventions for maintenance and/or weight loss must focus on effective models to maximize the chances of success.

Keywords: Exercise; Focus groups; Weight loss; Endurance; High intensity Functional training.

Introduction

Obesity is one of the most serious public health problems worldwide due to the associated medical, psychosocial and economic consequences[1,2]. About two billion adults worldwide are affected by excess weight[3]. According to data from the 2019 National Health Survey (NHS), the prevalence of obesity in adults in Brazil was 25.9%, and 62.6% of the population was overweight[4].

Treating obesity is complex, multidisciplinary and involves changing lifestyle habits, which includes a combination of dietary intervention and regular physical exercise (PE)[1], in addition to pharmacological and surgical interventions[2,5]. However, there is a decrease in

adherence to intervention programs[6] due to barriers encountered during this process, with physical inactivity being a major challenge for health and treatment effectiveness[7].

Adherence is defined as "the extent to which a person's behaviour in taking medication, following a diet, and/or executing lifestyle changes corresponds with agreed recommendations from a healthcare provider"[8], and is identified in the literature as an essential factor for the effectiveness of physical exercise (PE) programs[9]. In fact, regular exercise is an important facilitator for the weight reduction process, reinforcing behaviour and diet maintenance[10]. Considering the importance of PE in the process of losing and/or maintaining weight, qualitative research can provide deeper understanding of the perceptions for its adherence since there is a lack of knowledge regarding the difficulties for these individuals to practice PE, and how negative experiences can exert influence over this[7,11]. Therefore, some qualitative studies highlight different barriers to weight reduction with exercise intervention, which include factors related to the absence of support/supervision[12], feelings of shame linked to the gaze of the other[13,14] and other routine responsibilities[15-18].

Low adherence to training may also be associated with the characteristics of the prescribed exercises. Coquart et al.[19] found that intermittent exercise (IE) is perceptually less hard to be performed than continuous exercise (CE), which suggests a bigger possibility of adherence to this type of exercise. On the other hand, CE is a widely performed and accessible intervention for improvements in health and weight control[20]. However, it requires a high training volume and intensity to promote significant caloric expenditure, and participants can easily become bored by the monotony of exercise[21]. Thus, training modalities using IE may be more appropriate to stimulate adherence[19.]

Growing evidence has supported IE as a time-efficient strategy[22-24] to improve health-related parameters such as reducing adiposity and cardiometabolic risk factors in overweight or obese patients[25]. In addition, it is perceived as a more pleasant and dynamic alternative[26].In a systematic review, Wewege et al.[24] found that IE and CE cause similar improvements in body fat levels in excess weight individuals in the short term.

There are different methods of training including IE. High intensity functional training (HIFT) stands out, since it presents exercises with a multicomponent and multiplanar character, considering the principle of specificity to promote synergistic and integrated adaptations in physical capabilities. In addition, HIFT is a highly cost-effective option[27] It is still unclear whether IE has any advantage over CE for maintaining exercise adherence. It is necessary to know more about the attitudes and motivations of overweight people in relation to PE. Thus, our study assessed the perceptions of subjects in a weight loss program, identifying barriers and facilitators for adherence to different exercise protocols (continuous and high-intensity functional training).

Methods

Participants

The intervention was publicized through leaflets, social networks and on the site of the local university. It was necessary to meet the following criteria in order to participate: being adults (between 18 and 60 years old), with a body mass index (BMI) between 25 kg/m^2 - 39.9 kg/m^2 and stable weight in the last three months. Thus, body mass was measured using a digital scale with a maximum capacity of 150 kg (Tanita®, model BC-558, Campinas, Brazil), and height was determined using a portable stadiometer (Sanny®, ES2030, São Paulo, Brazil). Participants were excluded if: they were included in another regular exercise program; presented Diabetes Mellitus, hormonal disorder or food allergy; performed a prescribed diet or used weight-loss medication in the past three months; high alcohol consumption (>168g/week), bariatric surgery for at least one year or ongoing pregnancy; or presented musculoskeletal

disorders that could restrict the practice of high intensity exercises, with these criteria being evaluated by a specialized medical team.

Ethical aspects

The study was approved by the local Research Ethics Committee (Blinded for the peer review process) and is registered in the Clinical Trials Registry (Blinded for the peer review process), following the recommendations of the Declaration of Helsinki for research involving human subjects.

Study design

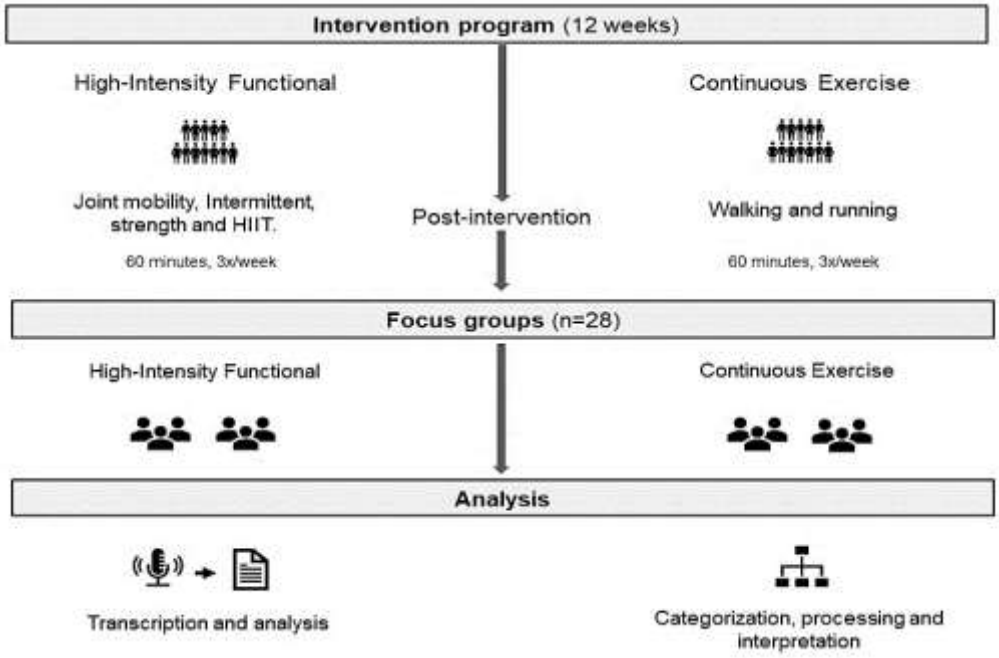
This is a qualitative and exploratory study conducted through focus groups with overweight individuals (n=106) who participated in a weight loss program, lasting 12 weeks, involving the prescription of semi-supervised physical training (two supervised training sessions and one unsupervised session per week).

The participants were allocated into two experimental groups: HIFT (n=49), with three weekly sessions of approximately 60 minutes, divided into four parts: (1) dynamic warm-up; (2) circuit training focused to stimulate physical capacities such as muscle power, velocity and agility; (3) circuit training based on functional movement patterns (similar to activities of daily living), consisting of exercises to stimulate muscle strength; (4) finally, high-intensity intermittent cardiorespiratory exercises were performed, such as running and recreational games.

The CE group (n=57) performed sessions composed of two moments: (1) dynamic warm-up; (2) cyclical endurance exercises, such as walking and running, mainly aimed at stimulating cardiorespiratory capacity and muscular endurance.

Both training programs correspond to an intervention in a randomized controlled clinical trial, described in detail in a previously published study[28]. The participants were invited during training, by phone or email to participate in the focus group sessions, so that their perceptions regarding adherence to training protocols could be collected.

Figure 1. Stages of study development.



Note: HIIT, High intensity interval training.
Source: authors

Data collection

Four sessions for data collection were held with 28 volunteers distributed in two focus groups for each exercise protocol, with six to eight participants. The sessions were audio-recorded using a portable recorder and a computer with a microphone and lasted between 48 and 80 minutes, respecting the necessary setting for this type of collection.

The focus groups were conducted by a trained moderator who used a guide containing key questions to identify barriers and facilitators of adherence to exercise protocols (Chart 1). An observer was additionally present who took notes during and after the sessions in order to facilitate transcriptions and identify possible non-verbal expressions that could be used for analysis.

Chart 1. Guide to key questions after the exercise program.

Main question	Determinants
What were the barriers/facilitators you faced in adhering to the physical exercise practice proposed by the program?	Related to the individual: Motivation / self-control / dissatisfaction with body image / comparison with other individuals / pain / time availability
	Related to the treatment program: Group treatment / type of exercise / frequency / intensity / support from the professional team / diet parallel to exercise
	Extrinsic: Social support / physical space

Source: authors.

Data analysis

The recorded verbal material was transcribed in full, revised and organized into three textual *corpuses* for data analysis, with a single *corpus* with all texts corresponding to the responses of the focus groups, another textual *corpus* separated in coding by type of determinant (barrier or facilitator) regardless of the type of training, and the third separated by type of exercise. The IRAMUTEQ® version 0.7 alpha 2 software program (*Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires*) was used to explore the main information contained in the texts through statistical analysis and processing.

The textual *corpus* was revised to standardize terms, correct typos, exclude all questions and adequately code the responses for analysis. In this study, Descending Hierarchical Classification (DHC) and a Word Cloud analysis were performed. DHC is a method which aims to obtain word classes from the single textual corpus which have similar vocabulary, and differences in text segments from other classes. IRAMUTEQ® organizes the data analysis in a dendrogram, which graphically presents the relationships between the classes. The Word Cloud application was performed from the textual corpus by type of determinant and taking into account the type of exercise.

The processed data were submitted to Content Analysis[29], following three phases: pre-analysis; exploration of the material; and finally, treatment and interpretation of results. Text segments were read and coded to identify emerging themes arising from the data. The list of themes was revised, modified and refined until all data was accommodated. All steps were repeated by a second researcher and differences were discussed until reaching a consensus to ensure the validity and reliability of the results. Weight loss data were specifically expressed as mean ± standard deviation, and a two-way ANOVA followed by Bonferroni post-hoc was performed. Significant differences were found when $p < 0.05$.

Results

A total of 38 (66.6%) participants finished the 12-week intervention in CE group, and 34 (69.4%) in the IE group. Significant weight loss was verified in both groups (CE, pre-test: 84.45 ± 14.40 kg; post-test: 77.45 ± 14.8 kg; Δ% = -8.2%; IE, 84.41 ± 10.89 kg; post-test: 76.07 ± 9.06 kg; Δ% = -9.8%).

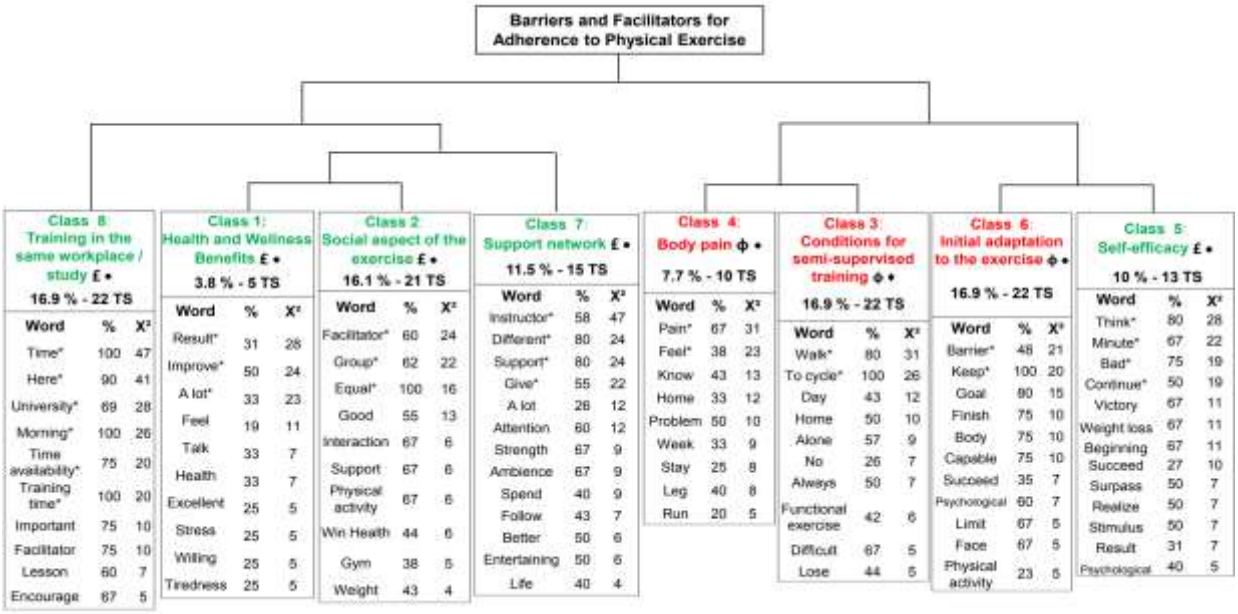
The focus group was composed by 28 participants, of which 67.9% were female. The mean age of the group was 32 ± 9.38 years, and the mean BMI was 31.73 ± 3.64 kg/m². A total of 4.521 occurrences of words were observed along with 962 distinct forms in the textual corpus analysis consisting of all the perceptions from participants, regardless of the type of exercise.

Of these, DHC processed 130 text segments (TS) with 100% usage, resulting in eight word classes defined as the following categories: (1) Health and wellness benefits; (2) Social aspect of the exercise; (3) Conditions for semi-supervised training; (4) Body pain; (5) Self-efficacy; (6) Initial adaptation to the exercise; (7) Support network; and (8) Training in the same workplace/study.

Figure 2 shows the frequency of occurrences per category, the relationship between the categories, the active words from the analysed perceptions, and the similarities and differences found between the training groups. The type of adherence determinants present in the categories are indicated by colour, with the colours being red for barriers and green for facilitators, identified by retrieving the context of the words.

Each category is described by the most significant words and their respective associations. The relationships between the categories indicate three main groupings. In the first, the complementarity between classes 1 and 2 was evidenced. These categories are associated with class 7, which is also integrated into class 8, indicating coherence of the semantic content between them. The second grouping shows the relationship between classes 3 and 4; and the third is composed of classes 5 and 6.

Figure 2. Dendrogram of the Descending Hierarchical Classification of the focus groups.



Note: Abbreviation settings and symbols: TS - Text segment; X^2 - Chi-squared test, reveals the associative strength between words and their respective class; * Statistically significant words (X^2), with a value greater than 3.84, representing $p < 0.0001$; **ϕ** Barriers to adherence to PA found in the intervention groups; **£** Facilitators for adherence to PA found in the intervention groups; ♦ Perceptions found only for the IE; • Similar perceptions between CE and IE.
Source: authors.

Category 1 was characterized by the words: "result", "improve" and "a lot", and it was highlighted that the benefits to health and well-being, in turn related to stress reduction, increased self-esteem, better sleep quality, improvements in physical conditioning and body composition are important PE facilitators for both intervention groups, according to the excerpts analysed below:

> Even though I'm not losing a lot of weight, I feel like my health has improved. I'm not feeling dizziness anymore, or weakness. I feel much more willing to do any activity today (Female, 27 years old).

> I was too tense, too angry. And the result already happened in the first week. So there's no way not to get motivated. You can calm down, be able to sleep, be cheered up and have a better disposition… (Female, 35 years old).

Category 2 with the words: "facilitator", "group" and "equal", emphasizes the social aspect of the exercise, of being part of a group of people with the same goals, mainly in the recognition, acceptance and sharing of problems, and is a similar facilitator for adherence to CE and IE protocols. The PE in group was considered easier and more pleasant, different from the gym environment, in which most individuals reported feeling intimidated and embarrassed:

> That's why it's nice to be there, everyone together doing the activity with no difference between us. Nobody is better than the other. Everyone is the same (Female, 34 years old).

> There, everyone is equal, all of the same weight. And in the gym, no. You get there and a very thin person passes by and you say: - My God, I don't even have the courage to look at that weight. So you get more restricted (Female, 40 years old).

Category 3 concerns the barrier found only for IE, related to the feasibility of conditions for including training in the routine. Many participants reported difficulties in performing PE outside the context of the program offered by the university due to the lack of an ideal environment, associated with the absence of social support and professional supervision, preferring the practice of continuous exercise (walking, running, cycling) as an alternative to the IE. The following excerpt illustrates this context:

> I liked walking, and riding a bike would be something I would really do. Now this thing about functional exercise alone in the house, it's complicated (Female, 37 years old).

Category 4 is related to physical limitations associated with body pain (knee, spine, muscle), which brought feelings of discomfort and malaise during movements, presented as a barrier similar to PE for the two training groups:

> The barrier in physical activity is pain. The pain caused. It is difficult for you to keep the goal of overcoming yourself with so much pain in the body (Male, 48 years old).

Category 5 focused on self-efficacy related to feeling empowered and confident to overcome barriers and limitations associated with CE and IE. The sense of accomplishment and pride after achieving a goal or progressing encouraged them to continue in PE:

> I think I realized how capable I am. When I want to, I can reach the goal (Female, 27 years old).

Category 6, a common barrier for both groups, refers to the initial adaptation to exercise due to the lack of physical conditioning and the feeling of self-sabotage of not being able to complete the training. Participants summarized these feelings by saying:

> And in the beginning I always tried to keep that frequency. I'm walking fast, but there's always a time when you're tired, you can't take it (Female, 22 years old).

> I really believe that the main barrier was: - will I make it? So you limit yourself, you set a limit (Male, 25 years old).

Category 7 highlights the support network characterized by valuing the supervision and attention of physical education professionals and social support as important for promoting and maintaining PE. Professional support was the most cited component of this category, participants mentioned the stimulus, attention, encouragement and motivation of the team instructors as a facilitator. The following excerpt illustrates this context:

> I think the support was very good. The availability of the physical education staff was super interesting, a facilitator. It was a support that we had, the people who were there supporting (Female, 20 years old).

Category 8 scores the importance of training in the same workplace/study, as relevant for the groups in relation to adherence and exercise maintenance. Since PE is done in a common

environment for daily activities, the participants mentioned compensating for a time between appointment intervals to stay active, without the need for a greater displacement to practice, which would demand time and organization:

> The question of time for me is very important. I get here at 1pm, and I don't leave until 11 at night. So it's inside the university, I leave my class schedule and do the activities (Female, 35 years old).

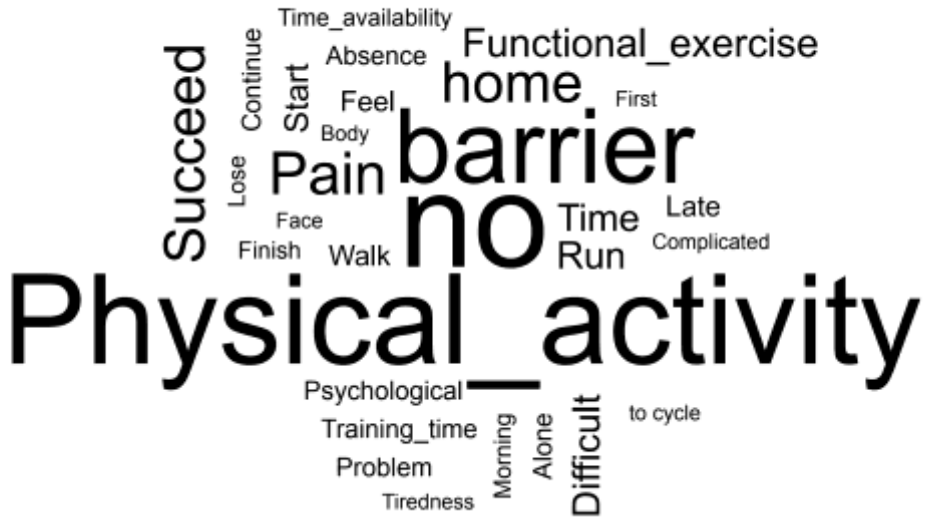
Word Cloud

The words were grouped and graphically organized according to their frequency using the Word Cloud method, with the determinants being analysed by type of exercise and independently of the type. It can be seen in figures 3 and 4 that the words are positioned in such a way that the most frequent ones appear larger than the others, demonstrating their prominence in the textual *corpus*. The complementary analyses to the dendrogram are presented below, highlighting the main results in relation to common barriers and facilitators and the additional differences found between the groups (HIFT x CE).

Barriers

Regarding the barriers to exercise adherence, the word "no" was the one that had the highest frequency in the textual *corpus*, followed by the words: physical activity, barrier, succeed, home and pain (Figure 3). The word "succeed" is associated with the difficulty of not performing the PE due to the barriers presented by the participants. The prevalence of the term "home" refers to the obstacles caused by the lack of an ideal environment for the inclusion of prescribed exercises in the routine. In addition, the word "pain" ratifies bodily limitations as one of the main barriers to training.

Figure 3. Word cloud with barriers to adherence, regardless of exercise type.



Source: authors.

The word clouds referring to barriers, separated by type of exercise, were similar, except for aspects related to the practice of HIFT performed outside the context of the weight loss program, being represented by the word "home" (data not shown in this file).

Facilitators

The word "physical activity" was the most frequent regarding the facilitators, followed by the words: "a lot", "we", "instructor" and "succeed". The sense of collectivity related to the group shows the importance of interventions in groups with similar characteristics and goals as a facilitator. The prevalence of the term "instructor" also corroborates the importance of professional support for success in adhering to and maintaining PE. Moreover, the expression "succeed" reinforces the feeling of confidence and competence when completing the training as fundamental to the continuity of the exercise.

Figure 4. Word cloud with facilitators for adherence, regardless of exercise type.

Source: authors.

Complementing the results presented in the dendrogram, a difference for the facilitators between the exercise groups was also observed in the word clouds. The type and characteristic of the exercise as simple and dynamic was frequent in IE, represented by the word: gym. Aspects related to the gradation and dynamics of the exercises were mentioned as main differences, as noted in the following excerpt:

> With the project there was this different thing, you know? Like a gymkhana. We went to the high school gymkhana and had fun and everything and that made me really happy. (…) As I said before. About the physical activity modality itself, which is not boring. It's not monotonous (Male, 22 years old).

Discussion

The present study showed that the type of exercise, whether HIFT or CE, did not mainly influence the perceptions of barriers and facilitators for adherence to the program among

individuals participating in a weight loss program. In other words, they shared the main problems and stimuli for PE practice. However, the HIFT had some characteristics of its own, which on the one hand was considered dynamic and fun; but on the other, it was considered limiting because it needed structure and guidance for its execution.

Numerous factors negatively impacted PE levels for both protocols, with common barriers including body pain, early adaptation to exercise and lack of time. These are consistent with those mentioned in previous qualitative research[17,18]. Excess weight due to mechanical overload on joints[30] and the inflammatory impact of adipose tissue [20,31] are strong contributors to body pain. Limitations associated with pain generate increased difficulty in starting and/or maintaining PE due to negative feelings of discomfort and decreased pleasure, which impacted self-efficacy and exercise motivation[20,32]. CE can be more difficult to bear for people with obesity, as longer sets can prolong discomfort[20]. In comparison, HIFT can shorten the exposure time to pain. However, there was no difference between the intervention groups in the current study.

The initial adaptation to exercise related to the feeling of self-sabotage and embarrassment associated with body dissatisfaction[15,16,32], which emphasizes the need for a jointly organized treatment context with people in the same situation[33], making them feel comfortable and accepted in a group with which they could share their experiences[13].

The importance of exercise in the workplace/study was also scored as a common encourager. This was mainly due to the facilitators related to the program, such as professional support, group exercise and an ideal environment for carrying out PE. Maintaining exercise in a different context would require more time available, becoming a commonly cited barrier among the general population [15,16,18]. Thus, interventions in different contexts, whether at work[2], at home or at leisure, in addition to IE as a time-efficient alternative[34], can be strategies to promote adherence of PE and fight the increase in obesity.

Participants identified a number of common factors for PE adherence consistent with other studies, including the support network[32,35], social interaction[36], self-efficacy[22,36] health benefits associated with disease prevention, stress reduction, pleasure, well-being[14,37] and improvements in physical fitness[17,18]. Our findings indicated that the support network and social aspect of the exercise were expressive enablers.

Social support is a dominant motivator for the general population. It has been articulated in other studies as being important for maintenance and weight loss goals[10]. Professional support in the introduction of PE and treatment adhesion[12,37], and the lack of supervision[38] were the main important factors identified in exercise discontinuity. Participants valued social contact and preferred group activities due to feelings of belonging and fun. HIFT only presented one exclusive reference as the facilitator. The characteristics of being simple and dynamic were primary motivators for maintaining PE in this group due to aspects related to fun, gradation, and a variety of exercises. One of the most important elements of fun is related to the feeling of pleasure in exercising[6] and in group-based settings[39]Less time commitment[22,23], in addition to decreasing monotony, can also make it more pleasurable than CE[26].

On the other hand, the impossibility of including the training in a setting outside the university was a salient barrier for IE, as many participants highlighted a preference for CE practice under these conditions. It is easy to access and has low complexity[20], they do not need a fixed establishment, and it is usually held in public spaces, enabling social interaction, associated with physical and psychosocial benefits[14,36].

This study contributes to greater understanding of the perceptions of overweight and obese individuals undergoing a weight loss program about the factors influencing PE, previously little explored in research, helping in the search for effective strategies for acceptance and adherence to long term protocols. Participants also had the opportunity to exchange experiences with each other.

Despite the strength of the findings, some limitations deserve consideration. The results refer to overweight individuals participating in a weight loss program with adequate physical and professional structures, and therefore cannot be extrapolated to other situations for treating overweight individuals. Furthermore, while there may have been additional opinions and insights among those who chose not to participate in the focus groups, we believe we reached information saturation. Due to the data collection methodology, the possibility that the participants felt uncomfortable during the focus groups and did not express some views is not discarded, although all precautions with the setting were respected.

These findings can be useful in developing and implementing viable interventions that meet individual preferences and tolerances from the introduction of personalized routines that consider the characteristics and effectiveness of PE to encourage adherence and promotion of a physically active lifestyle.

In addition, programs should raise awareness of the health benefits of PE and involve strategies that include time efficiency, fun, professional support, and interaction in groups with similar goals and difficulties. This also implies in the participation of a multidisciplinary team to help change behaviour and enable individuals to minimize barriers and help reduce and/or maintain body weight.

Conclusion

The results of this study suggest that the support network, group exercises and health and well-being benefits are important determinants of PE in overweight individuals. In addition, the main barriers include adapting to exercise, bodily pain, and time availability. There were no significant characteristics that distinguish the HIFT and CE. Although HIFT was considered fun and enjoyable, its limitations of inclusion in the routine constitute a barrier.

An understanding of the factors implicit in exercise adherence and weight control by professionals is essential for promoting a physically active lifestyle. Therefore, future interventions for weight loss and control must focus on effective models to make them more accessible and maximize the chances of success.

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