Strength and functional conditioning training: analyzing practitioners' perceptions

Entrenamiento de fuerza y acondicionamiento funcional: analizando las percepciones de los practicantes

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Abstract

Introduction: Currently, both recreational participants and athletes are required to maintain fitness levels that enable them to endure the specific physical demands of their activities for longer periods. At the same time, they must be able to perform high-level technical movements during various sports activities, which are carefully planned to improve physical condition, well-being, and quality of life.
Objective: This study aims to analyze participants' perceptions regarding the motivations that lead them to either engage in or avoid strength and functional conditioning training.
Methodology: The study group consisted of 189 participants from strength and/or functional training facilities (boxes), spread across three municipalities in the district of Viseu. QMAD and IMAAD surveys were adapted for this application's context, adding information to the four dimensions of the Exercise Motivation Inventory (EMI). Descriptive and inferential data analyses were performed using version 29 of SPSS software.
Results: The motivations driving or limiting practice result from a complex interaction between personal, social, and environmental factors. Understanding the motivations or barriers associated with practice is essential for developing strategies that promote adherence and continuity, creating more stimulating learning environments, and better adapting training methodologies to participants' preferences and needs.
Conclusions: Functional training is a fundamental approach to improving physical performance compared to traditional methods, as it confirms a substantial increase in physical capacity indices.

Keywords

Athlete; functional conditioning; motivation; recreation; strength training.

Resumen

Introducción: Actualmente, tanto los participantes recreativos como los atletas deben mantener niveles de condición física que les permitan soportar las demandas físicas específicas de sus actividades durante períodos más largos. Al mismo tiempo, deben ser capaces de realizar movimientos técnicos de alto nivel durante diversas actividades deportivas, los cuales están cuidadosamente planificados para mejorar la condición física, el bienestar y la calidad de vida
Objetivo: Este estudio tiene como objetivo analizar las percepciones de los participantes respecto a las motivaciones que los llevan a participar o evitar el entrenamiento de fuerza y acondicionamiento funcional.
Metodología: El grupo de estudio estuvo compuesto por 189 participantes de instalaciones de entrenamiento de fuerza y/o acondicionamiento funcional (gimnasios o "boxes"), distribuidos en tres municipios del distrito de Viseu. Se adaptaron encuestas QMAD e IMAAD para el contexto de esta aplicación, añadiendo información a las cuatro dimensiones del Inventario de Motivación para el Ejercicio (EMI). Se realizaron análisis descriptivos e inferenciales de los datos utilizando la versión 29 del software SPSS.
Resultados: Las motivaciones que impulsan o limitan la práctica resultan de una interacción compleja entre factores personales, sociales y ambientales. Comprender las motivaciones o barreras asociadas con la práctica es esencial para desarrollar estrategias que promuevan la adherencia y la continuidad, creando ambientes de aprendizaje más estimulantes y adaptando mejor las metodologías de entrenamiento a las preferencias y necesidades de los participantes.
Conclusiones: El entrenamiento funcional es un enfoque fundamental para mejorar el rendimiento físico en comparación con los métodos tradicionales, ya que confirma un aumento sustancial en los índices de capacidad física.

Palabras clave

Acondicionamiento funcional; atleta; entrenamiento de fuerza; motivación; recreación.

Introduction

Sports are a multifactorial phenomenon that occupies one of the most representative places in our time, with the benefits associated with sports practice being both evident and well-documented. In this regard, the Canadian Society for Exercise Physiology (CSEP, 2019) advises adults to engage in at least 150 minutes of aerobic physical activity per week as a preventive measure against health's deterioration (both physical and mental). The same organization also recommends supplementing this aerobic activity with muscle-strengthening exercises at least twice a week, as part of a combined and preventive effort to reduce the risk of various diseases (such as heart and physiological conditions), in addition to the overall benefits for a healthy life (CSEP, 2019).

Based on the premise of promoting physical and sports practice, Prikhodko's (2018) research highlighted that one of the main obstacles to adopting an active lifestyle has been Physical Education's inefficacy as a subject in captivating young people through motivating and creative activities that align with their interests and, in turn, spark their interest in sports and their practices' maintenance. At the core of this concern is a notable effort to increase the availability of exercise programs, ranging from low to high intensity (Sibley, 2016), which not only meet the body's needs but also enhance social constructs.

Indeed, among all the dimensions that comprise sports in its entirety, its social aspect has experienced a peak in prominence over the last decade, thus encouraging adherence to sports practices, according to Elias and Dunning (2021). Research is now focusing its scope on motivation as a catalyst for physical and sports activity, even identifying it as a key factor in sports performance (Chang et al., 2017; Ramírez, 2021; Vázquez & López, 2019). In the context of the present research, motivation is understood, among other possible definitions, as the drive that moves an individual to initiate an action or activity (Ewald & Caregnato, 2023).

Studying the symbiosis between motivation and sports is well-rooted in the literature, beginning with the Self-Determination Theory (Deci & Ryan, 2012) as one of the pioneers and, as such, one of the most prominent in this context, as well as those concerning the positive impact of motivation on sports practice, especially among young people and adolescents (Andreu, 2018; Castro, 2020; Franco et al., 2017; González, 2021; Hurtado et al., 2020; Lizarazo et al., 2020; López et al., 2021; Moral-García et al., 2021; Villarreal-Ángeles, 2021). Although conducted at different times, all the cited studies postulate the free involvement of individuals in their activities, whether sports-related or not, considering a series of psychological mechanisms that regulate behavior in the pursuit of social orientation and integration. Hence, Suárez and Jiménez (2021) propose a multidimensional explanation of motivation, understanding it as a continuum where behavior can be unmotivated, intrinsically motivated, or extrinsically motivated.

Nevertheless, after the American College of Sports Medicine (2011) revealed that most of the population fails to meet the recommendations regarding physical activity's frequency and intensity, concern for overall physical fitness began to increase (Yang, 2019). Among other trends, Functional Fitness (FF) emerged, initially created within the military but quickly adapted to the community, thereby gaining popularity since its inception and implementation (Carvalho et al., 2023; Moran et al., 2017). FF can be viewed as a physical skills' integrated training, as it is based on training models aimed at improving athletic performance (Toledo et al., 2021). Within this context, high-intensity training models have been used to try to meet international recommendations, including Functional Training, Crosstraining, and CrossFit.

Functional Training aims to transfer the effects obtained from exercise to effective daily actions, engaging the entire neuromuscular system (Liebenson, 2014). This approach has been widely adopted by Physical Education and Sports professionals, aiming to improve an individual's ability to perform daily activities. On the other hand, and according to Cracană and Virgil (2023), Crosstraining incorporates a reinterpretation of military training and includes high-intensity aerobic and anaerobic exercises that combine weightlifting, isometrics, and calisthenics principles, i.e., exercises that use one's own body weight.

Finally, CrossFit, according to Kolomiitseva et al. (2020), is a non-specialized training program that involves performing high-intensity functional exercises, grounded in the principles of interval training, gymnastics, athletics, and powerlifting. Eather et al. (2015) primarily attribute CrossFit's popularity to

its ease of integration with other fitness activities, which require minimal equipment, space, and organization. Naturally, CrossFit has gained a foothold among sports professionals and military personnel, whose interest in the program has become significant (Sibley & Bergman, 2018).At first glance, the three aforementioned training models might seem identical because there are many overlapping elements that easily create associations. However, the philosophy, approach, overall objectives, and emphasis on exercises vary for each model.

For example, while Crosstraining is often associated with a wide range of exercises aimed at improving overall fitness, Functional Training focuses on everyday movements and aims to enhance the overall functionality of the body specifically for performing these daily activities, emphasizing multi-joint and integrated muscle movements. Regarding the emphasis placed on exercises, while the first model highlights flexibility, balance, and cardiorespiratory function, the second model targets muscle stability, joint mobility, and overall coordination. Lastly, in terms of overall objectives, Crosstraining aims to improve general physical fitness by promoting increased strength and endurance. Functional Training, on the other hand, seeks to enhance bodily functionality for daily activities by improving overall stability and balance, serving as a preventive measure against injuries.

Now, considering CrossFit, this model is characterized by a fitness conditioning program that focuses on performing functional movements at high intensity, combining weightlifting with gymnastic and cardiovascular exercises, typically conducted in a group setting with timed or interval-based workouts. Analyzing its structure and methodology, CrossFit is defined by the combination of circuit-style workouts, commonly known as "WOD" (Workout of the Day), which are planned and prescribed according to usually weekly objectives. The central goal of this training model is to improve overall physical conditioning, including cardiovascular endurance, strength, power, speed, agility, balance, flexibility, and coordination. Although CrossFit can be mistaken for Crosstraining, it is important to recognize that the latter is more comprehensive, while the former is more specific and restricted, with its own guidelines and methodologies.

To enhance understanding, we have grouped these three models into a common category that is broad enough to encompass their purposes, which we refer to as "strength and functional conditioning training." This category focuses on developing bodily functionality for daily routines while simultaneously improving general physical condition and fitness. All these methods combine joint and muscular exercises with high-intensity cardiovascular exercises. Thus, strength and functional conditioning training can incorporate elements of Functional Training, Crosstraining, and CrossFit, with the goal of improving overall physical condition as well as the mental health and well-being of individuals, adapted to their specific needs.

Based on the aforementioned concepts, this study aims to analyze practitioners' perceptions regarding the motivations that lead them to either engage in or avoid strength and functional conditioning training in three municipalities in Viseu's District.

Method

Since this study involves the analysis of perceptions, meaning the interpretation of participants' actions, a quantitative study was chosen, using a questionnaire due to its versatility and effectiveness in data collection.

Participants

The study group consisted of a total of 189 practitioners of strength and functional conditioning training, distributed across Castro Daire, Sátão, and Viseu. It is important to note that all strength and functional conditioning training facilities (boxes) in Viseu's municipality participated in the study. The inclusion criteria required a minimum age of 18 years, at least six months of training experience, and a minimum practice frequency of twice a week. All participants engaged in strength and functional training, in alternating sessions throughout the week.

The gender distribution is nearly equal, although female participants make up the majority (55%), while males account for 45%. The ages range from 18 to 58 years, with the majority of participants falling within the 30-40 age group (57.1%). A significant proportion of participants reside in urban areas

(73.5%), and 66.7% have higher education qualifications, including Bachelor's degrees (41.3%), Master's degrees (23.3%), and Doctorates (2.1%).

Regarding distribution by municipality, 83.1% practice in Viseu, while 10.6% are affiliated with Sátão and 6.3% with Castro Daire. The participants are considered experienced, as 76.2% have more than six months of practice experience, and 45% have between 3 and 7 years of experience. The level of experience/practice supports this, with 70.9% at an advanced level, and an overwhelming majority practice between 3 and 6 times per week (90.5%). Finally, in terms of exclusive practice, 58.7% reported not engaging in any additional activity. Among those who complement their training with another modality, 21.2% are involved in individual sports, 10.6% in team sports, and 9.5% in other types of activities.

Procedure

Regarding the methodological aspects that guided the organization and collection of the data to be subsequently processed, that is, concerning the protocol for administering the instrument, the following steps were undertaken: a) Gathering the telephone contacts and respective email addresses of the study's involved entities; b) Contacting the responsible parties by phone to explain the study's objectives and obtain the necessary authorization; c) Personally delivering the questionnaire, ensuring that the researcher was absent during the completion period to avoid influencing the responses; d) Collecting the questionnaires one week after personal delivery.

Care was taken to create and maintain a welcoming environment, concluding with a thank you for participating in the study and for the sincerity in the responses provided. It is also important to note that after obtaining the necessary consent from the institution, all participants received and signed an informed consent form before participating. This document detailed the research objectives, the involved procedures, potential benefits, and addressed any questions the participants might have had.

Strict measures were implemented to preserve the participants' anonymity and confidentiality. The collected information was processed in a strictly confidential manner, with no personally identifiable data disclosed. In line with this, the participants' affiliated entities were also coded, from "A" to "E," to ensure anonymity. The data was securely coded and stored, accessible only to the research team.

Instrument

The structural core of the "Motivation Questionnaire for Sports Activity" (QMAD) by Serpa and Frias (1992) was used, which was subsequently adapted to the context of this study and its inherent objectives. In addition to the statements that make up the eight dimensions of the QMAD, a set of statements from the four dimensions of the Exercise Participation Motivation Questionnaire (MPEM) by Kolomiitseva et al. (2020) was added, specialized in analyzing the motivation behind choosing CrossFit programs.

Concurrently, the validated version by Fernandes et al. (2005) of the Survey on Motivations for the Absence of Sports Activity (IMAAD), originally created by Pereira and Vasconcelos Raposo (1998), was used to analyze motivation underlying the lack of involvement in sports activities from a psychosocial and contextual (environmental) perspective.

The first part of the composite instrument is informative and serves to characterize the participants, providing indicators for participant profiling, concluding with their alignment with the training entity/facility and respective training program. The second part includes a set of statements focused on motivations for participation and non-participation, using a Likert scale conveniently modified to measure the degree of agreement with the corresponding items. This scale ranges across four levels, from total disagreement ("strongly disagree") at level one to total agreement ("strongly agree") at level four, grouped around the following dimensions:

•QMAD (Serpa & Frias, 1992) - "Status" - recognition or prestige, social status; "Pleasure" - positive and gratifying emotional state resulting from an experience with similar characteristics; "Emotions" - mental states that arise in response to stimuli and influence behavior and social interaction; "Competition" - overcoming obstacles, challenging oneself to achieve goals; "Physical Fitness" - overall health, well-being, and physical capacity; "Technical Development" - specific skills or procedures for performing a task or achieving a goal; "General Affiliation" - association with an organization, group, or

institution as a means of social integration; "Specific Affiliation" - association with a particular entity, group, or specific category.

•MPEM (Kolomiitseva et al., 2020) - "Innovation" - introduction of new processes or practices that add value and contribute to personal improvement; "Health" - state of complete physical, mental, and social well-being; "Physical Fitness" - the body's ability to perform physical activity efficiently without experiencing excessive fatigue or risk of injury; "Expression/Communication" - exchange of ideas, thoughts, and feelings between individuals.

•IMAAD (Fernandes et al., 2005): "Sport Aversion" - incompetence, lack of interest, or resistance/repulsion towards practice; "Lack of Support/Conditions" - absence of encouragement, support, or assistance regarding a particular situation; "Disinterest in Physical Effort"; "Aesthetic Dissatisfaction" (with physical appearance); "Lack of Time."

Data analysis

According to the predefined objectives, both descriptive and inferential analyses of the data were conducted using IBM Statistical Package for the Social Sciences (SPSS) version 29, with a confidence interval set at 95%, thereby defining the significance level of the study (p-value) at 0.05. Non-parametric tests (Mann-Whitney and Kruskal-Wallis) were employed due to the non-compliance with the assumptions required for parametric tests, specifically the distributions' absence of normality (Marôco, 2018). The results reveal, based on the previously created and mentioned scales and dimensions, the respondents' perceptions regarding a set of indicators that

allow inference about the importance they place on strength and functional conditioning training practice and non-practice. The analysis was grounded in critical conception, language dynamics, and the interpretation that respondents assign to the concepts' meaning, considering the producers' contextual conditions as well.

Results

Following the initial descriptive analysis, Table 1 presents the dimensions and scores assigned by study participants according to their perceptions. Notably, all responses were recorded, with no missing values. The least valued dimensions by respondents include status, sports aversion, aesthetic dissatisfaction, and lack of support/conditions, as the agreement scale was not fully utilized (maximum score of 3).

Conversely, the most valued dimensions are related to technical development, physical fitness, and health, as evidenced by the highest mean and mode values. Lastly, lack of time stands out as the dimension with the greatest dispersion in responses, indicated by the highest standard deviation value.

Table 1. Analysis Dimensions and Assigned Scores

DIMENSIONS	N		M	Mod	SD	Min	Max
	valid	omitted					
Technical Development	189	0	3,43	4,00	0,54	1,00	4,00
Status	189	0	1,57	1,00	0,54	1,00	3,00
Emotions	189	0	3,28	3,00	0,56	1,00	4,00
Physical Fitness	189	0	3,53	4,00	0,44	1,00	4,00
General Affiliation	189	0	2,78	3,00	0,68	1,00	4,00
Specific Affiliation	189	0	2,81	3,00	0,64	1,00	4,00
Competition	189	0	2,45	2,00	0,60	1,00	4,00
Pleasure	189	0	2,82	3,00	0,65	1,00	4,00
Innovation	189	0	2,93	3,00	0,81	1,00	4,00
Health	189	0	3,42	4,00	0,65	1,00	4,00
Physical Conditioning	189	0	3,03	3,00	0,70	1,00	4,00
Expression/Communication	189	0	2,42	3,00	0,53	1,00	4,00
Sports Aversion	189	0	1,44	1,00	0,55	1,00	3,00
Aesthetic/Dissatisfaction	189	0	1,46	1,00	0,47	1,00	3,00
Lack of Support/Conditions	189	0	1,61	1,00	0,51	1,00	3,00
Lack of Time	189	0	2,38	2,00	0,90	1,00	4,00
Disinterest in Physical Effort	189	0	1,51	1,00	0,48	1,00	4,00

The following results emerged from variables' inferential analysis:

• Gender: Statistically significant differences were found between genders. Females placed significantly higher value on the dimensions of "Specific Affiliation" (p=.02), "Expression/Communication" (p=.01), "Sports Aversion/Incompetence" (p=.02), "Aesthetic Dissatisfaction" (p=.00), and "Disinterest in Physical Effort" (p=.01). Males, on the other hand, valued the "Innovation" dimension significantly more (p=.01).

•Educational qualifications: Statistically significant differences were observed based on educational qualifications. Specifically, Bachelor's degree holders valued the "Status" dimension significantly more than those with Secondary Education (p=.02). Additionally, Master's degree holders and Bachelor's degree holders valued Competition" significantly more than those with Secondary Education (p=.00).

•Residential Environment: Statistically significant differences were found between rural and urban residents. Individuals from rural areas placed significantly higher value on the "Health" dimension compared to those from urban areas (p=.04).

•Box Affiliation: Statistically significant differences were found between different training facilities. Specifically, members of facility "B" valued the "Specific Affiliation" dimension significantly less than members of facilities "C," "D," and "E" (p=.01). Regarding "Aesthetic Dissatisfaction," members of facility "A" valued this dimension significantly less than members of facilities "B," "C," and "D" (p=.04).

•Experience: Statistically significant differences were noted based on the duration of practice. Specifically, practitioners with 3 to 5 years of experience and those with more than 5 years of experience valued "General Affiliation" significantly more than practitioners with less than 6 months of experience (p=.03). Additionally, those with 3 to 5 years and more than 5 years of experience valued "Disinterest in Physical Effort" significantly more than those with less than 6 months of experience (p=.02).

•Practice Level: Statistically significant differences were found among different levels of practice. Practitioners at intermediate and advanced levels valued "Pleasure" significantly more than beginners (p=.04). Advanced practitioners valued "Innovation" significantly more than intermediate practitioners (p=.02). Furthermore, practitioners with 3 to 5 years and more than 5 years of experience valued "Aesthetic Dissatisfaction" significantly more than those with less than 6 months of experience (p=.03). Those with 3 to 5 years and more than 5 years of experience also valued "Disinterest in Physical Effort" significantly more than those with less than 6 months of experience (p=.02).

Discussion

Cracană and Virgil (2023) emphasize the need to revitalize the teaching-learning process by introducing new training methods, among which strength and functional conditioning training stand out. Paraschiv (2009) highlighted the importance of functional training in athletes' physical condition, a finding later supported by Olaru et al. (2018) through a comparative analysis of athletes subjected to traditional and conditioning training methods.

The results indicated that functional training proved to be a viable alternative for performance improvement compared to traditional methods, confirming a substantial increase in strength, endurance, balance, and flexibility indices. Wilke et al. (2019) revealed that this methodology is quick, effective, and motivating for untrained healthy adults. Additionally, Smîdu (2021) inferred the advantages of functional conditioning concerning the optimization of mental skills.

Among the objectives guiding this research were the analysis of perceptions driving participation in specific sports activities (Duarte, 2016; Januário et al., 2012), as well as the intention to infer differences based on gender, age, and other relevant demographic indicators.

The responses' analysis, based on gender, revealed that the most valued dimensions are affiliation, innovation, and expression/communication. These findings are consistent with studies by Bycura et al. (2017), Coyne and Woodruff (2020), Fisher et al. (2016), and Popp et al. (2018). Studies by Davies et al.

(2016) and Sibley and Bergman (2017) also highlighted similar dimensions in exclusive CrossFit practitioners' context, with men participating in CrossFit for more competitive reasons compared to women (Ayar, 2018).

According to Box et al. (2019), older participants highlighted health-related motivations, while younger participants focused on relational aspects. However, our study found that age was not a differentiating factor, as there were no significant differences between older and younger participants in the study group.

Feito et al. (2018) found that frequent practitioners scored higher on social recognition. This aligns with our findings, which indicate a relationship between experience and the value placed on general affiliation. CrossFit practitioners showed higher levels of perceived relationship and competition compared to practitioners of other modalities (Pinto, 2022). This was also evident in the different educational levels' comparison in our study, where Master's and Bachelor's degree holders valued these dimensions significantly more than those with Secondary Education.

According to training environments (boxes), our results contradict those of Partridge et al. (2014), which concluded that the perception of what is emphasized and rewarded within the training environment does not change. In contrast, our study revealed that the sense of belonging is significantly more valued depending on the location of the training space.

Finally, when comparing rural vs. urban participants, and contrary to Köteles et al. (2016), which suggested that functional conditioning training is not associated with well-being, body awareness, and body image satisfaction, participants from rural areas in our study valued the "health" dimension significantly more than their urban counterparts.

Conclusions

Functional training is a crucial approach for improving physical performance compared to traditional methods, confirming a substantial increase in physical capacity indices. The motivations driving or limiting individuals' engagement in strength and functional conditioning training result from a complex interplay of personal, social, and environmental factors. Understanding these motivations, as well as the barriers associated with practice, is essential for developing strategies that promote adherence and continuity to such practices, contributing to practitioners' health and well-being.

The relevance of this study's results lies in its contribution to pedagogical and technical practices, providing important information to enhance training approaches. This aims to assist sports and health professionals in creating more stimulating learning environments and adapting training methodologies to practitioners' preferences and needs. This includes fostering individual and/or group work and promoting autonomy to increase participation and motivation.

Future research should consider applying the instrument at multiple time points to verify the consistency of responses over time, thus enhancing the robustness of participants' perceptions. Similarly, expanding the geographical scope of the study is recommended, as each environment has its own dynamics and characteristics. Therefore, replicating the study in different demographic contexts is crucial for validating the applicability of the conclusions.

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