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ORIGINAL ARTICLE

Training program influences the relation between functional and neuromuscular performance indicators during the season in young soccer players

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KEYWORDS

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Training content;
Soccer;
U-17 soccer players

Abstract The aim of this study was to investigate the influence of a training program on the relation between performance indicators of different physical capacities intra and inter functional and neuromuscular systems at different times of the season. Subjects were 16 young soccer players with an average age of 16.5 ± 0.4 years. The study was carried out for 17 weeks, including three assessment moments (T1: 1st, T2: 10th and T3: 17th week). High correlation was found between indicators of neuromuscular predominance (30 meters sprint test (30m) and Maximum Sprint (MaxSprint) (RAST) in T1) ($r=0.93$, $p \leq 0.001$), functional (Sprints Average (MidSprint) and Minimal Sprint (MinSprint) (RAST) in T1, T2 and T3; MinSprint and Fatigue Index (FI) (RAST) in T3) ($r=0.95$, 0.85 , 0.91 ; -0.86 , $p \leq 0.001$, respectively) and between functional and neuromuscular indicators (30m and MidSprint in T1; 30m and MinSprint in T1; MaxSprint and MidSprint in T1 and T2 and MaxSprint and MinSprint in T1) ($r=0.95$, 0.93 , 0.96 , 0.84 , 0.87 , $p \leq 0.001$, respectively). The training contents had influence on the correlation of performance indicators at different times of the season.

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PALAVRAS-CHAVE

Treinamento esportivo;
Conteúdo de treinamento;
Futebol;
Futebolistas sub17

Programa de treinamento influencia a relação entre os indicadores de desempenho funcional e neuromusculares durante a temporada em jovens futebolistas

Resumo O objetivo do presente estudo foi verificar a influência de um programa de treinamento na relação entre indicadores de desempenho de diferentes capacidades físicas intra e inter sistema funcional e neuromuscular em diferentes momentos da temporada. Participaram do estudo 16 jovens futebolistas com idade média de $16,5 \pm 0,4$ anos. O estudo decorreu por 17 semanas, incluindo três momentos de avaliação (T1:1^a; T2:10^a e T3:17^a semana). Foram encontradas alta correlação entre indicadores de predominância neuromuscular (Sprints em 30m (30m) e Sprint Máximo (MaxSprint) (RAST) em T1) ($r=0,93$; $P \leq 0,001$), funcional (Média de Sprints (MidSprint) e Sprint Mínimo (MinSprint) (RAST) em T1, T2 e T3; MinSprint e Índice de Fadiga (FI) (RAST) em T3) ($r=0,95$; $0,85$; $0,91$; $-0,86$; $P \leq 0,001$, respectivamente) e entre funcional e neuromuscular (30 m e MidSprint em T1; 30 m e MinSprint em T1; MaxSprint e MidSprint em T1 e T2 e MaxSprint e MinSprint em T1) ($r=0,95$; $0,93$; $0,96$; $0,84$; $0,87$; $P \leq 0,001$, respectivamente). Os conteúdos de treinamento exerceram influência na correlação dos indicadores de rendimento nos diferentes momentos da temporada.

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PALABRAS CLAVE

Entrenamiento deportivo;
Contenido de la formación;
Fútbol;
Futbolistas sub-17

Un programa de formación influye en la relación entre los indicadores de rendimiento funcionales y neuromusculares durante la temporada en futbolistas jóvenes

Resumen El objetivo de este estudio fue investigar la influencia de un programa de formación en la relación entre los indicadores de desempeño de las diferentes capacidades físicas intra y intersistemas funcionales y neuromusculares, y en diferentes momentos de la temporada. En el estudio participaron 16 jugadores de fútbol jóvenes con una media de edad de $16,5 \pm 0,4$ años. El estudio duró 17 semanas, incluyendo tres momentos de evaluación (T1: 1.^a; T2: 10.^a y T3: 17.^a semana). Se encontró una alta correlación entre los indicadores de prevalencia neuromuscular [sprints en 30m (30m) y sprint máximo (MaxSprint; RAST) en T1 ($r=0,93$; $P \leq 0,001$)], funcional [sprint medio (MidSprint) y sprint mínimo (MinSprint; RAST) en T1, T2 e T3; MinSprint e índice de fatiga (FI; RAST) en T3 ($r=0,95$; $0,85$; $0,91$; $-0,86$; $P \leq 0,001$, respectivamente)] y entre funcional y neuromuscular [30m y MidSprint en T1; 30m y MinSprint en T1; MaxSprint y MidSprint en T1 y T2, y MaxSprint y MinSprint en T1 ($r=0,95$; $0,93$; $0,96$; $0,84$; $0,87$; $P \leq 0,001$, respectivamente)]. Los contenidos de la formación han influido en la correlación de los indicadores de rendimiento en diferentes momentos de la temporada.

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Introduction

Soccer is one of the most practiced sports in the world, which awakes many researchers' interest on better understanding its specificities regarding performance components, such as the physical, the technical, the tactical, the psychological and others ones (Stolen et al., 2005; Bangsbo, 2006; Silva et al., 2008). Most of these studies aim to investigate the physical component, related to the sport competitive performance.

Specifically in relation to the physical component, it is known that the efforts that soccer players perform are intermittent, composed of displacements at intensities which range from walks to low-moderate intensity running and intense sprints (Stolen et al., 2005; Di Salvo et al.,

2007; Bradley et al., 2009). They also perform deflections, twirls (Bloomfield et al., 2007), jumps, and specific technical actions (Mohr et al., 2003; Rampinini et al., 2007) which require high coordinative patterns, totalizing 1000–1400 actions during the match, which alternate every 4–5 s (Thomas and Reilly, 1979; Bangsbo, 1996).

This fact shows that a soccer player performance is guided and sustained by the manifestation of several physical capacities and their subdivisions, since they are interrelated and, therefore, not manifested in an isolated way. Such interrelations cannot be restricted or decoupled in relation to the influences of the training content, since there is the predominance of a specific manifestation over the other, but not the restriction or exclusive development of the trained physical capacity.

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