87 - AN COMPARATIVE STUDY OF FUNCTIONAL ASPECTS AMONG PLAYERS OF FUTSAL OF DIFFERENT COMPETITIVE LEVELS AND GOES TACTICAL POSITION OF IT GAME

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INTRODUCTION

The Soccer of Living room, today an organized sport modality called Futsal, was invented in the beginning of the century passed in Uruguay as an alternative to the Soccer of traditional field (MOREIRA, et, al, 2000).

Futsal is now the sport with larger number of apprentices so much in Brazil as us too much countries American South and also in Europe (TENÓRIO, 2002). The interest of the media, of the clubs and associations and of companies sponsors, it took Futsal to a great growth in the last two decades, reaching and staying in high level (not only considering aspects of the game, as well as organizations, competitive and professionals), (MACHADO and GOMES, 1999).

Especially in the south area of Brazil, where the cold is intense and it ends up transferring the players of the field inside of gyms, Futsal is extremely practiced and organized, there is not a city that doesn't have at least a tournament a year in this modality. It fits to point out that the teams of the south Brazil have been arriving to most of the decisions of the Brazilian League of Futsal, demonstrating the technical might and organizational of this sport in this area.

In this sense it becomes justifiable the need to increase the scientific knowledge in this sport, and in general it is possible to verify the contribution of the Physiology of the Exercise, of the Biomechanics, of the Nutrition and of the Sport Training in the search of improvement of the technique or of the performers' physical condition to long for better results. However the players' technical and tactical capacity can be enhanced consistently when the athletes possess good physical levels compatible with the activity that is being practiced.

Like this, information regarding the elite athletes' functional characteristics would be particularly important to establish reference patterns in referred him sport. That is justified how it was said previously, that, in the Futsal and in other sports, characteristics as the technical and tactical ability and the individual physical acting, are the most important factors for the success of the team. In the literature, few reference patterns are observed regarding the athletes' of the Futsal category variables physics. In this sense, the objective of this work was to identify the professional athletes' of Futsal functional profile and to characterize them for game position and competitive level.

METHODOLOGICAL PROCEDURES

The population was constituted by 40 professional players of futsal, chosen intentionally, belonging to three teams that disputed the Futsal championship of the state of Rio Grande do Sul, organized for the Futsal Federation of the state of Rio Grande do Sul, in the three available categories, series gold 2001 (team Ipiranga Futebol Clube), series silver year 2000 and series bronze year 1999 (teams of the Esporte Clube Itapagé).

For the evaluation of the potency maximum aerobics the test of 12 minutes was used proposed by Cooper (1982), in the case of the potency lactic anaerobic the test of 40s, proposed by Matsudo (1983). For the agility tests the tests were used of it shuttle-run and of the quadrant, described by Marins and Giannichi (1996). In the functional measures, a chronometer was used accurately of second hundredths and a measuring tape of 1mm. For the abdominal test the standardization of AAHPER was proceeded (1976 apud MARINS and GIANNICHI, 1996) and the tests of Vertical and Horizontal Impulse were the chosen ones for the variables of muscular potency of the lower extremity.

For the tabulation of the data the program was used *EXCEL* version 2003 and the statistical package *MINITAB* it goes Windows v13.0 to the treatment of the data. They were obtained the averages of the variables by team and for tactical position of game (goalkeeper, fixed, line and pivot). Analyses of Variance were accomplished (ANOVA) among the teams and between the positions and the test "t" for independent samples in the case of data contained in only two teams. Concluding, a test of correlation of Pearson was accomplished among some you varied pertinent of investigation in this sense (sum of the skin folds, test of 40 seconds, maximum volume of oxygen (VO2max), horizontal impulse (IH) and vertical (IV), agility (Agile. 1)). The size of the sample differed, depending on the number of appraised subjects for each variable.

The referring athletes to the championship of the years 2001 and 2000 were in the middle of the season and the referring athletes to the year of 1999 they were in the beginning of the season.

RESULTS AND DISCUSSION

The athletes' general characteristics as well as the referring results to the related functional variables for competitive level, they are described in the table 1.0,001 [a])

Table 1-Averages, standard deviations, test "t" of Student and variance analysis (ANOVA) of the results of the functional tests: IH (m), 40s (m), abdominal (rep.), agility 1 (shuttle-run) and agility 2 (quadrant) for the groups formed by the athletes of the teams belonging to the series gold, silver and bronze of the Futsal championship of the state of the south of Brazil.

VARIABLES	STATISTICS	gold series	silver series	bronze series
		n = 12	n = 13	n = 15
Age	Average	24,250	21,923	21,533
(years)	SD	5,294	3,148	3,998
	ANOVA	ns	ns	ns
IH	SAMPLE	n = 12	n = 12	n = 12
(meters)	Average	2,48	2,40	2,43
	SD	0,14	0,25	0,17
	ANOVA	ns	ns	ns
Cattles. Anaerobic	SAMPLE		n = 11	n = 15
(m)	Average		277,5	281,3
	SD		20,4	17,3
	t		t=0,605ns	
Abdominal	SAMPLE		n = 12	n = 11
(rep.)	Average		63,08	45,55
	SD		7,05	8,65
	t		T(0,001 [a])	
Agility 1	SAMPLE	n = 6	n = 11	
(seg.)	Average	9,590	8,985	
	SD	0,063	0,324	
	T	T(0,001 [a])		
Agility 2	SAMPLE	n = 12	n = 12	
(points)	Average	30,75	32,00	
	SD	2,01	1,35	
	T	t=0,087ns		

a = Significant for the test t, at the level of 0,1% of trust ($\rho \leq 0,001$).
ns = Not significant for the test t, being considered a minimum level of significância of 5% ($\rho \leq 0,05$).

The table 2 presents the results of the analyses of these data, independent of the competitive level, but, it separates them for tactical position of game.

Table 1 - Averages, standard deviations, test t of Student and variance analysis (ANOVA) of the results of the functional tests: IH (m), 40s (m), abdominal (rep.), agility 1 (shuttle-run) and agility 2 (quadrant) for the groups formed by the athletes of different game positions.

	STATISTICS	Goalkeeper n = 8	Fixed n = 8	Line n = 13	Pivot n = 11
Age	Average	21,375	23,625	21,538	23,545
(years)	SD	3,623	2,387	3,643	6,089
	ANOVA	ns	ns	ns	ns
IH	SAMPLE	**n = 7**	**n = 6**	**n = 12**	**n = 11**
(meters)	Average	2,42	2,52	2,38	2,47
	SD	0,21	0,23	0,19	0,16
	ANOVA	ns	ns	ns	ns
Res. Anaerobic	SAMPLE	**n = 6**	**n = 5**	**n = 9**	**n = 6**
(40s)	Medium	280,0	290,0	280,0	285,0
	Average of the positions	12,4	17,0	12,7	12,8
	Z	-0,40	1,14	-0,38	-0,24
	Kruskal-Wallis	ns	ns	ns	Ns
Abdominal	SAMPLE	**n = 5**	**n = 3**	**n = 9**	**n = 6**
(rep.)	Average	61,40	60,67	51,56	50,83
	SD	13,74	5,51	11,17	12,14
	ANOVA	ns	ns	ns	ns

ns = Not significant for ANOVA, being considered a minimum significant level of 5% ($\rho \leq 0,05$)

In relation to the explosive force of inferior members, measured starting from the test of horizontal impulse (IH), it was demonstrated there not to be difference statistics nor for team does either for game position (table 1 and 2). However when confronting our data with the results obtained by Moreira et. al. (2000), which found in 11 athletes of the first state division of Futsal of Presidente Prudente-SP, in the year of 1999, a similar score (average 245,4±18,6cm) to our athletes.

Unlike our results, the study of Arruda et. *al.* (2000) it showed there to be difference in the explosive force between players of field soccer and your tactical positions in the game, finding a better acting in the extending ones of the knees to a speed of contraction of 300º/s for the lateral ones and tips in comparison with the half field players ($p<0,005$) and these superiors to the back players.

It is still noticed, in the table 2, that the fixed ones and pivots possessed a tendency to have, on average, a better score than the lines and the goalkeepers. That is acceptable assuming that these positions demand more jumps than the other positions in the game, requesting a larger explosive force of these athletes' inferior members. The illustration 3 evidences this tendency of the fixed ones (2) and pivots (4).

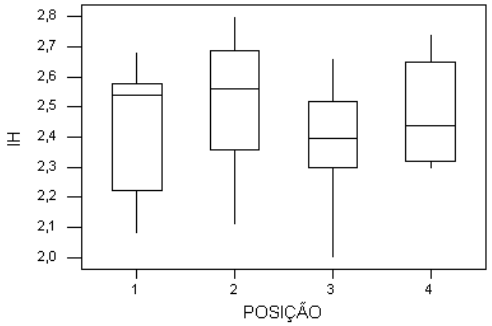


Figure 2. Variability of the data with relationship to the physical quality of horizontal impulse for game position in Futsal.

The table 1 display that, in relation to capacity physical resistance lactic anaerobic, the differences among the averages of the scores obtained by the appraised athletes of two of the three teams (series silver and bronze) they didn't show significant differences, evidencing a characteristic of similarity of this physical capacity in the levels of competitive demand.

Among the muscular groups more demanded in Futsal players are the abdominal and the flexion of the hip muscles. The table 1 reveals the results of the test of abdominal which demonstrates that the averages were shown different significantly among the teams and it points out the athletes' belonging to the series silver advantage in relation to the of the series bronze. This characteristic could be explained by the difference of the competitive moment in that the players appraised the two groups of athletes, in the athletes' of the series bronze case, season beginning, and the one of the series silver, amid the competitive period. Moreira *et. al.* (2000) tell an average of 54,4 repetitions for your population of appraised players what it demonstrates that our athletes of the series silver, met with resistance comparable to the appraised athletes for Moreira.

The quality physical displacement agility is very important for the game of Futsal, because the game area is restricted and the floor, as well as the ball, they provide fast movements. To verify a possible influence of this physical quality, a test was accomplished "t" of Student in the averages of the results of the test of it shuttle-run (agility 1, table 1) of the players for categories of the teams. The results demonstrated, unlike our hypotheses, that the athletes that argued to the series silver possessed a displacement agility significantly larger than your friends of the series gold.

Another agility form is the individual's capacity it to move the fastest possible your center of gravity in a small space. The quadrant test measures this physical capacity and it was tested in the selected athletes of the study. As it showed the table 1, the teams didn't differ significantly to each other, showing a balance in this physical quality among the levels of competitive demand.

The physical capacity of resistance aerobics (Vo2max) it was also tested in this study and with the results its took place a test "t" between the teams of the series silver and bronze. Don't were found differences among the averages of the teams ($P = 0,994$), tends as average for the teams a value of Vo2max of 54,53 and 54,51 for series silver and bronze respectively. Dantas *et. al*., evaluated the 13 athletes' of the Futsal team of Vasco da Gama, champion of the national league of 2000, found a value of VO2max of 59,50 ml/kg/min.

Already Silva and Barros (2000), evaluated 11 Futsal players and they found medium values for VO2max corresponding to 54,67ml/kg/min, and they compare your sample with players of field soccer and of beach soccer, not finding significant difference among those classes of players. It is noticed that the value found by the authors it is similar to the value found in this study.

Soares et. al. (2000) verified the aerobic potency of 25 athletes of field soccer and they divided among the different positions of the game, finding the following results. Goalkeepers 52,68±3,2; players of defense 60,28±6,23; players of the lateral ones 61,12±5,33; players of the middle field 61,01±7,14 and attackers 59,94±6,19ml/kg/min. The authors tell significant differences between the goalkeepers and the other players and to the players of the lateral ones and players of the middle field in relation to the defense players and attackers.

In our study, we didn't find significant differences among the game positions in this physical quality. Very probably in function of the number of athletes for position to be reduced to be detected in a statistical analysis. However, the above-mentioned authors comment that there is not a specific training for each position of the game, crediting, therefore the differences found by them the specific of the movement of each position during the departures and collective.

With the objective of verifying possible relationships among the collected data, a test of correlation of Pearson was accomplished among the following variables: Stature, Horizontal Impulse (IH); Sum of the skin Folds; Length trunk-cerebral (CTE); heart Frequency of rest (FCR); it tests of 40s; Vo2max; Vertical Impulse (IV); it tests of Abdominal (ABD); and displacement Agility (1) and displacement of the center of gravity (2). The table 3 display the correlations that can be evidenced.

Table 3 - Values of correlation of Pearson among some varied from interest to Futsal.

	40s	IV	Agil. 1	Vo_{2max}
40s		r=0,892 p<0,000	r=-0,843 p<0,001	
IH	r=0,421 p<0,045	r=0,793 p<0,000		
IV				r=0,848 p<0,002
Sum. DC	r=-0,458 p<0,024	r=-0,424 p<0,044		r=-0,496 p<0,031
Agil. 1				r=-0,765 p<0,010

Among these correlations they can stand out as interesting for the futsal modality the explosive force of inferior members (IV), linking strong and positively with the resistance lactic anaerobic (40s) and the same with potency maximum aerobic (Vo2max), we also found strong and negative correlation for displacement agility (agile. 1) with resistance lactic anaerobic and potency maximum aerobic.

CONCLUSIONS

In agreement with the presented results, it can be concluded that, when we compared athletes belonging to competitions of different technical levels it could be evidenced differences in the capacity neuromuscular of abdominal resistance, which was shown better conditioned the athletes of the silver series in relation to the bronze series. A probable explanation can be in function of the competitive period in that the athletes were appraised.

The displacement agility it other capacity that showed was also differentiated among the appraised teams, demonstrating that the team belonging to the silver series was with a better athletic capacity than your pairs of superior competitive level.

Finally, it was found data statistical significant in the positive correlations for potency of inferior members with resistance lactic anaerobic and VO2max and negative correlations among displacement agility with resistance lactic anaerobic and with VO2max.

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AN COMPARATIVE STUDY OF FUNCTIONAL ASPECTS AMONG PLAYERS OF FUTSAL OF DIFFERENT COMPETITIVE LEVELS AND GOES TACTICAL POSITION OF IT GAME

ABSTRACT

The present study intended to do a characterization of the functional aspects of Futsal professional players' and compare them from different competitive levels and for tactical position carried out in the game. The sample was composed by 40 Futsal professional players, chosen intentionally, belonging to three teams that disputed the of Futsal championship of the state Rio Grande do Sul, organized for the Rio Grande do Sul Federation of Futsal, in the three available categories, series gold of the year 2001 (team of Ipiranga Futebol Clube), series silver year 2000 and series bronze year 1999 (teams of the Esporte Clube Itapagé). The potency maximum aerobics (Vo2max), the potency lactic anaerobic, the displacement agilities and mobility of the center of gravity, it forces abdominal and muscular potency of inferior members was analyzed through Analyses of Variance (ANOVA) among the teams and enter the game positions. The test "t" was used for data only contained in two groups. Concluding, a test of correlation of Pearson was accomplished among some you varied pertinent of investigation in this sense. The data evidenced that, when we compared athletes belonging to competitions of different technical levels it could be evidenced differences in the capacity neuromuscular of abdominal resistance, which was shown better conditioned the athletes of the silver series in relation to the bronze series. The displacement agility other capacity that she showed was also differentiated among the appraised teams. Finally, it was data significant statistical in the positive correlations for potency of inferior members with resistance lactic anaerobic and VO2max and negative correlations among displacement agility with resistance lactic anaerobic and with VO2max.

Word-keys: functional Capacity, competitive levels, Futsal.

LES COMPARER ETUDE DU PROFIL FONCTIONNAIRE DES JOUEURS PROFESSIONNELS DE FUTSAL DE DIFFERENTS NIVEAUX COMPETITIFS ET DE LA POSITION TACTIQUE DE CHACUN DANS LE JEU

RESUME

Cette étude a eu pour but faire une caractérisation du profil fonctionnaire-moteur des joueurs professionnels de Futsal et les comparer a partir de différents niveaux compétitifs et de la position tactique de chacun dans le jeu. L'échantillon a été composé de 40 joueurs professionnels de futsal choisis intentionnellement. Ils appartiennent à trois équipes qui ont disputé le championnat "gaúcho" de futsal organisé par la Fédération "Gaúcha" de Futsal du "Rio Grande do Sul", dans les trois catégories disponibles: série "or" de l'année 2001 (l'équipe "Ipiranga Futebol Clube"), série "argent" de l'année 2000 et série "bronze" de l'année 1999 (les équipes du "Esporte Clube Itapagé"). La puissance aeróbique maxime, la puissance anaérobique lactique, les agilités du déplacement et la mobilité du centre de pesanteur, la force abdominale et la force de flexeurs de la hanche et la puissance musculaire des membres inférieurs ont été analysés par des "Análises de Variância" (ANOVA) entre les équipes et les positions de jeu. Le teste "t" a été utilisé seulement dans deux groupes, pour des données contenues. Pour finir, un test de corrélation de *Pearson* a été effectué parmi quelques variables pertinentes d'enquête. Les données ont démontré que quand on compare les athlètes qui appartiennent à des compétitions de différents niveaux técniques, on peut vérifier des différences dans la capacité neuromusculaire de résistance abdominale. Les athlètes de la série "argent" se sont montrés mieux conditionnés à cette capacité par rapport à ceux de la série "bronze". L'agilité de déplacement a été également une autre capacité qui s'est distingué parmi les équipes évaluées. Pour conclure, on a rencontré des données significatifs dans les corrélations positives pour la puissance des membres inférieurs avec de la résistance anaérobique lactique et le VO_{2max} et des corrélations négatives entre l'agilité du déplacement avec de la résistance anaérobique lactique et le $VO_{2max.}$

Word-keys: fonctionnaire-moteur, niveaux compétitifs, Futsal.

ESTUDIO COMPARACTIVO DE LOS ASPECTOS FUNCIONALES ENTRE JUGADORES DE FUTSAL DE DIFERENTES NIVEIS COMPETITIVOS Y PONER POSICIÓN TÁCTICA DE JUEGO

SUMARIO

El presente estudio pretended hacer una caracterización do perfil funcional-motor de jugadores profesionales de Futsal e compara-los a partir de diferentes níveos competitivos e por posiciones táctica desempeñada no juego. A muestra hace compuesta poner 40 jugadores profesionales de Futsal, selecto intencionalmente, perteneciente a tres equipos hace disputaran el campeonato "gaucho" de Futsal organizado Federación "Gaucha" de Futsal do Rió Grande do Sul, haces tres clases disponibles, serie oro del año 2001 (equipo Ipiranga Fútbol Club), serie plata año 2000 e serie bronce año 1999 (equipos del Esporte Clube Itapagé). A potencia aeróbic máxima (Vo_{2max}), a potencia anaeróbica láctica, as agilidades de dislocación e movilidad do centro de gravedad, fuerza abdominales e potencia muscular de miembros inferiores haces analizados a través de Análisis de Variância (ANOVA) entre as equipos e entre as posiciones del juego. O teste "t" hace utilizado para dados contados solamente en dos grupos. Finalizando, hace realizado un teste de correlación de *Pearson* entre algunas variables pertinentes de investigación. Los dados evidenciaran que, cuando comparamos atletas pertenecientes a competición de diferentes níveos técnicos pode-se evidenciar diferencias en la capacidad neuromuscular de resistencia abdominales, a cual se mostró mejores condicionados os atletas da serie plata en relación à serie bronce. A agilidad de descocamiento tamben otra capacidad que se mostró diferenciada entre as equipes evaluadas. Por fin, encontró dados estadísticamente significativos has correlaciones positivas para potencia de miembros inferiores con resistencia anaeróbica láctica e VO_{2max} e correlaciones negativas entre agilidad de dislocación con resistencia anaeróbica láctica e con VO_{2max}.

Palabras-llave: Capacidad funcional, niveis competitivos, Futsal.

ESTUDO COMPARATIVO DE ASPECTOS FUNCIONAIS-MOTORES ENTRE JOGADORES DE FUTSAL DE DIFERENTES NÍVEIS COMPETITIVOS E POR POSIÇÃO TÁTICA DE JOGO

RESUMO

O presente estudo pretendeu fazer uma caracterização do perfil funcional-motor de jogadores profissionais de Futsal e compara-los a partir de diferentes níveis competitivos e por posição tática desempenhada no jogo. A amostra foi composta por 40 jogadores profissionais de futsal, escolhidos intencionalmente, pertencentes a três equipes que disputaram o campeonato gaúcho de futsal organizado pela Federação Gaúcha de Futsal do Rio Grande do Sul, nas três categorias disponíveis, série ouro do ano 2001 (equipe do Ipiranga Futebol Clube), série prata ano 2000 e série bronze ano 1999 (equipes do Esporte Clube Itapagé). A potência aeróbica máxima (Vo_{2max}), a potência anaeróbia láctica, as agilidades de deslocamento e mobilidade do centro de gravidade, força abdominal e potência muscular de membros inferiores foram analisadas através de Análises de Variância (ANOVA) entre as equipes e entre as posições de jogo. O teste "t" foi utilizado para dados contidos somente em dois grupos. Finalizando, foi realizado um teste de correlação de *Pearson* entre algumas variáveis pertinentes de investigação neste sentido. Os dados evidenciaram que, quando comparamos atletas pertencentes a competições de diferentes níveis técnicos pôde-se evidenciar diferenças na capacidade neuromuscular de resistência abdominal, a qual se mostrou melhores condicionados os atletas da série prata em relação à série bronze. A agilidade de deslocamento também foi outra capacidade que se mostrou diferenciada entre as equipes avaliadas. Por fim, encontrou-se dados estatisticamente significativos nas correlações positivas para potência de membros inferiores com resistência anaeróbia lática e VO_{2max} e correlações negativas entre agilidade de deslocamento com resistência anaeróbia lática e com VO_{2max}.

Palavras-chaves: Capacidade funcional, níveis competitivos, Futsal.