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Investigation of Basic Motor Skills According to TGMD-2 Test on Male Athletes of 10 Ages Group Who Participated to Competitions in Individual, Team and Racket Sports Branches

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Abstract

This study investigated that were between differences of basic motor skill levels on 120 male athletes of 10 age groups that participated to competition in individual, team and racket sports branches. TGMD-II (Test of Gross Motor Development-2) was used a measurement method for basic motor skills that preferred commonly. Shapiro-Wilkoxon test was used for examining the normal distribution of data. One way analysis of variance (ANOVA) was used for determining of differences between sports branches. For significant differences the Tukey's HSD test was applied as the second-level test. ($p<0.05$) was accepted for the level of significance. According to sports branches the findings showed that, there were significant differences between TGMD-II object control sub-test scores ($F_{2,119}$; 7.935; $P<0.001$) and between TGMD-II points of children ($F_{2,119}$; 7.141; $P<0.001$), respectively. On the other hand, there were not significant differences between TGMD-II locomotors sub-test scores ($F_{2,119}$; 1.479; $P>0.246$). The significant differences between the TGMD-II locomotors sub-test, the object control sub-test and the total scores of TGMD-II can lead due to the individual, team and racket sports of the children. In addition, another effect can be caused by the children in adolescence as the effect of other sports. For taking under control of the adolescence and diversity of growth, it may be useful to apply similar studies in different age groups and various sports disciplines.

Keywords: Children, Sports, TGMD-II Test, Basic Motor Skills.

1. Introduction

Movement education aimed to develop the child's nervous muscle coordination, improving the physical fitness, supporting the development of perceptual-motor, strengthening the social-emotional development, providing the development of the ability of learning, free-time programming and evaluating. Editing of the meaningful education programs for the movement of the child affect to emotional, social and psychosomatic aspects (5). Motor development is composed of qualitative and quantitative changes in throughout the human life (14). Studies reinforced the belief that started to training of movement at an early age creating the infrastructure of the active sports training and sports performance. As a result of determination of the ability the child's developmental characteristics that referred to sports branches should be taken into account. These development processes follow a regular sequence. Period of the fastest gaining of movement skills and techniques are in the periods of childhood. Periods of 10 age development are included in the periods of late childhood and adolescence. Psychomotor developments are included in the period of sports-related movements (9, 10,12).

The aim of this study was investigation of basic motor skill levels on 120 male athletes of 10 age groups were

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participated to competition in individual, team and racket sports branches for at least 3 years. According to tests developed by Ulrich TGMD-II (Test of Gross Motor Development-2) was to investigate the levels of basic movement skills of children (16).

2. Material and Methods

2.1. Subjects

The universe of study was determined male athletes in the 10 age group who participated regularly sports and involved competition in sports clubs in Bursa. Then, the development of basic motor levels of children was measured by the TGMD-II test. The scoring is based on Total Motor Development Test (TGMD II) (16).

2.2. Statistical Analyses

Shapiro-Wilkoxon test was used for examining the normal distribution of data. One way analysis of variance (ANOVA) was used for determining of differences between sports branches. For significant differences the Tukey's HSD test was applied as the second-level test. ($p<0.05$) was accepted for the level of significance.

3.Tables

Table 1: The mean of age, height and body weight according to sports branches

						95% Confidence Interval for Mean			
Variables	**Sports**	**N**	**Mean**	**Std. Deviation**	**Std. Error**	**Lower Bound**	**Upper Bound**	**Min.**	**Max.**
Age	**Individual Sports**	40	10,238	,2529	,0400	10,157	10,318	10,0	10,5
	Racket Sports	40	10,125	,2193	,0347	10,055	10,195	10,0	10,5
	Team Sports	40	10,200	,2481	,0392	10,121	10,279	10,0	10,5
	Total	120	10,188	,2431	,0222	10,144	10,231	10,0	10,5
Height	**Individual Sports**	40	144,05	7,103	1,123	141,78	146,32	127	155
	Racket Sports	40	139,63	8,136	1,286	137,02	142,23	125	152
	Team Sports	40	143,53	6,038	,955	141,59	145,46	129	153
	Total	120	142,40	7,356	,671	141,07	143,73	125	155
Body Weight	**Individual Sports**	40	37,58	6,437	1,018	35,52	39,63	23	48
	Racket Sports	40	33,80	7,349	1,162	31,45	36,15	22	45
	Team Sports	40	37,38	5,452	,862	35,63	39,12	25	49
	Total	120	36,25	6,637	,606	35,05	37,45	22	49

In this study, there were not significant differences between the age difference of individual, team and racket sports branches statistically ($F_{2,119}$; 2.269; P>0.108). However, the mean age of children in individual sports (10.238±0.253) were higher than the team (10.200±0.219) sports and racket (10.125±0.219) sports (Table 1).

The difference of height was found significant, according to the sports branches ($F_{2,119}$; 4.326; P<0.015). The average height of individual sports (144.05±7.1 cm) was higher than racket sports (139.63±8.136 cm) and team sports branches (143.53±6.038 cm), respectively (Table 1).

The difference of body weight was found significant, according to the sports branches ($F_{2,119}$; 4.326; P<0.015). The average body weight of individual sports (37.58±6437 kg) was higher than racket sports (33.8±7.349 kg) and team sports branches (37.38±6.637 kg), respectively (Table 1).

Table 2: According to sports branches the locomotors sub-test, object control sub-test, TGMD-II total points (point).

						95% Confidence Interval for Mean			
Variables	**Sports**	**N**	**Mean**	**Std. Deviation**	**Std. Error**	**Lower Bound**	**Upper Bound**	**Min.**	**Max.**
Total Score of Locomotors Tests	**Individual Sports**	40	37,40	4,940	,781	35,82	38,98	25	45
	Racket Sports	40	35,73	5,643	,892	33,92	37,53	21	44
	Team Sports	40	37,50	5,277	,834	35,81	39,19	20	45
	Total	120	36,88	5,313	,485	35,91	37,84	20	45
Total Score of Object Control Tests	**Individual Sports**	40	62,03	7,516	1,188	59,62	64,43	44	76
	Racket Sports	40	53,65	11,412	1,804	50,00	57,30	30	77
	Team Sports	40	59,95	10,048	1,589	56,74	63,16	32	77
	Total	120	58,54	10,348	,945	56,67	60,41	30	77
Total Score of TGMD-II Tests	**Individual Sports**	40	99,43	9,852	1,558	96,27	102,58	81	116
	Racket Sports	40	89,38	14,925	2,360	84,60	94,15	60	120
	Team Sports	40	97,45	12,515	1,979	93,45	101,45	61	120
	Total	120	95,42	13,236	1,208	93,02	97,81	60	120

The results of this study showed that there was not significant difference between TGMD-II locomotors sub-test scores according to sports branches. ($F_{2,119}$; 1.479; P>0.246). The locomotors sub-test scores of children in team sports (37.5±5.27) were higher than the individual sports (37.4±4.94) and the racket sports (35.73±5.64), respectively. There was found the lowest TGMD-II locomotors sub-test scores (35.73±5.64) than the others in the children of racket sports (Table 2).

The results of test showed that there were significant differences between the TGMD-II object control sub-test scores of children ($F_{2,119}$; 7.935; P<0.001). Tukey's HSD test (follow-up tests) was applied as the second-level test for determining of significant differences between the groups. The TGMD-II object control sub-test scores of children who participated in individual sports (62.03±7.516) competitions were found higher than the children who participated in competitions of racket (53.65±11.41) and team sports (59.95±10.048), respectively (Table 2). There was found the lowest TGMD-II object control sub-test scores (53.65±11.41) than the others in the children of racket sports (Table 2).

The results of test showed that there were significant differences between the total scores of TGMD-II test of children ($F_{2,119}$; 7.141; P<0.001). Tukey's HSD test (follow-up tests) was applied as the second-level test for determining of significant differences between sports branches. The total scores of TGMD-II test of children who participated in individual sports (99.43±9.85) competitions were found higher than the children who participated in

competitions of racket (89.38±14.925) and team sports (97.45±12.515), respectively (Table 2). There was found the lowest TGMD-II total test scores (89.38±14.925) than the others in the children of racket sports (Table 2).

4. Conclusion

In this study, the locomotors sub-test scores were examined according to the sports branches; the locomotors sub-test scores of children who participated in competitions of individual, racket and team sports did not found higher significant differences statistically. Valentini and Rudisil studied on between 5-6 ages of boy and girls about basic motor characteristics. They found that there were not differences between the locomotors skill and perceptual competence in both boy and girls (17). These studies seem to support the findings of our study. Kürkçü et al. (11) studied on the 10-12 age group of badminton and soccer male players by used a different test battery; they found that both physical and physiological characteristics of soccer and badminton players were affected by their sports and they found some of the physiological characteristics in soccer players were better. In our study, locomotors sub-test scores of children participating in team sports were higher than others.

The object control sub-test scores of the children in individual, racket and team sports were found significant differences. The object control sub-test scores of children who participated in competitions of racket sports were lower than others. Valentini and Rudisil (17) studied on between 5-6 ages of boy and girls about basic motor characteristics. They found that male students had higher scores of object control skills than the female students. Cooley et al. investigated the gross muscle skills on 574 child of primary school at ages ranging from 7 to 10 in Tasmania by using of TGMD. They concluded that female students had lower scores of object control skills than the male students (8). Afonso et al. (1) investigated the basic motor skill levels on 427 female and 426 male children at ages ranging from 3 to 10 by using of TGMD-II Test. They found that male had higher levels of object controls. Simons et al. (15) examined the basic motor skills on female and male children at ages ranging from 7 to 10 by using of TGMD-II Test. They found that the object control skills affected by the age factor. Wong and Cheung (19) found that object control skills increase angular with age average of children. Ripka et al. (13) found the total TGMD-2 test scores of children in playing mini-volleyball had higher. These studies seem to support the findings of our study.

In this study, there were significant differences between Total TGMD-II Test Scores of the individual, racket and team sports of children at 10 ages. Total test scores of TGMD-II of the children in individual sports were higher than the scores of the children in racket and team sports, respectively. On the other hand, total test scores of TGMD-II of children who played racket sports were lower than others. In Aydın's study, there were significant differences between the basic locomotors, object and TGMD Total Scores of subjects (3). Another study, Cleland and Gallahue tested the ages of 4, 6 and 8 years, ranging from 40 male and female children. They examined the relationships between age, gender, experience of movement and the development of large muscle skills of children. As a result of this analyze; they identified that the years and experience of movement were 45% of the variance in children's large muscle skill (7). Bešlija and Božanić examined the relationships in basic motor skills with special skills of karate by the TGMD-2 test and they were found a positive relationship between them (4). These studies seem to support the findings of our study.

High scores of locomotors and object control skills were obtained by well-developed children. These kids are capable, with proper co-ordination skills, graceful and flowing movements; visual motor skills improved, and are defined as the athletic (2). Low scores obtained by the children who were poor motion and object control skills. But the because of the poor physical development of children in the early years, the motor functions (movements of the muscle and the body) had stayed back mental and spiritual development (6). Accordance with our study, Williams et al. (18) studied on the basic motor skills on the pre-school students at ages ranging from 3 to 4 by using of TGMD-II Test. They determined that the locomotors and object control skills of 3 years of age group were lower than the 4 years of age group. The cause of these findings; for increasing of the psychomotor development in parallel with age and physical characteristics, these studies seem to support the findings of our study.

In conclusion; it has shown that because of the athletes in the level of adolescence in this study the basic skills

have affected by this process. Implementation of different skill levels would be useful for children at various motor tests of different age groups and different sports branches. Also, it would be benefit for the purposes of determining the right time to provide technical education in determining the level of basic motor skills before the technical education in sports branches for the child. The technique that is taught at the right time in line with the development of the child will provide the most accurate way to increase the efficiency of his sport. In addition, it would be contribution to the children especially in selection of sports talent and in selection of appropriate sports branches.

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