

COMPARATIVE ANALYSIS OF MOTOR AND SPECIFIC MOTOR ABILITIES BETWEEN HANDBALL PLAYERS AND NON-ATHLETES IN THE CADET AGE FROM MONTENEGRO

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Abstract

The research was conducted in order to determine the differences in motor and motor-specific area of the Montenegrin youth of cadet age (14 ± 6 months; 15 ± 6 months). In this study a sample of 250 respondents was included, of which 200 boys who are not involved in organized training process and 50 handball players who are involved in organized handball training. Motor area was treated with twenty-one (21) hypothetical variables that cover the area of: segment speed, flexibility, explosive leg strength, explosive power of arms and shoulders, repetitive strength, coordination and balance. In the area of specific motor skills five (5) variables that hypothetically cover the area were applied: shooting precision, the ability of handling the ball, running speed in slalom, speed and keeping the ball and speed without the ball. Based on the results of determining the difference by t-test and discriminant analysis, we conclude that the handball players generally have better motor and specific-motor skills compared to students who are not actively involved in any form of physical activity in addition to regular physical education. Also, derived result points out that fourteen years old handball players have better results for a greater number of variables compared to fifteen years old non-handball players.

Key words: motor space, specific motor skills, athletes, students, cadets, t-test, discriminant analysis

Introduction

Handball is alternately high-intense contact team sport which requires a combination of aerobic and anaerobic endurance, for performing sequence of coordinated and complex motor activity (Chelly et al., 2011). Modern top handball requires a high level of motoric structures, in order to address certain specific tasks that arise in the course of the game, during the defense stage and offense stage. For players to be able to accomplish the requirements of the modern game of handball, they are expected to accomplish absolutely the greatest achievements in technical-tactical and physical preparedness. Handball is a sport that gained prominent place in Montenegro since the beginning of the interest in modern sports, both for the men's and women's competition (Muratovic, 2014). This work represents first detail research in Montenegro, with the aim to conclude is there a statistically significant difference in general and specific motor area of the Montenegro's youth of cadet age between handball players that are actively included into the training process and students that are not actively included in the handball training. Children population of today, age of fourteen and fifteen years who are students of final classes of the reformed nine year duration elementary school, is massively included in handball training, which tells us that this sport is widespread and popular in our country (Bjelica, Georgiev and Muratovic, 2012). Previous research conducted in order to analyze the difference between handball players of different ages and from different ranks of competition (Vuleta, Milanovic and Nikolic, 2012; competition have better results compared to handball players from lower ranks, which is explained by the dynamics of their growth and development. Also, based on the previous research, the results of

seniors generally show superior results compared to the cadet age, but not for all variables (Vuleta, et al., 1999). One direction of the research about handball is determination of the fitness of male and female handball players, and the special problem is precisely analyses of differences between handball players of different age categories (Milanovic, Vuleta and Tomasevic, 2013).

Methods

The total sample consisted of 250 subjects divided into four groups. The first group consisted of 100 handball players aged 14 years \pm 6 months; The second group consisted of 100 handball players aged 15 years \pm 6 months; The third group consists of 25 students aged 14 \pm 6 months; The fourth group consists of 25 students aged 15 years \pm 6 months. Handball players are from handball clubs the "Sailor 7" from Bar and "Zeppelin" from Podgorica, while students (non-athletes) are from the final grade of reformed nine years duration elementary schools in Podgorica and Nikšic. Motor area was estimated with 21 variables: To estimate the frequency of movements: 1. Hand tapping (TAPRUK); 2. Foot tapping (TAPNOG); 3. Foot tapping of the wall (TAPNOZ); For the assessment of flexibility: 4. Straddle bend (PRERAS); 5. Deep forward bend on the bench (DUBPRKL); 6. Bat contortion (ISKPAL); For the assessment of explosive leg strength: 7. long jump from the spot (SKUDMJ); 8. High jump from the spot (SKUVMJ); 9. Running 20m-high start (SPR20M); To estimate the explosive force of arms and shoulders: 10. Throwing the handball ball from the straddle sitting position (BARUKL); 11. Throwing basketball ball of the breast from sitting on a chair (BAKOŠL); 12.

Throwing medicine ball from lying on the back (BAMEDL); To estimate the repetitive force: 13: Lifting the torso in 30 sec (PODT30S); 14. Pushups from the ground (SKLNTL); 15. Pull-ups from hanging on the shaft (ZGVNVR); For the evaluation of coordination: 16. Eight with bending (OSMSAG); 17. Agility in the air (OKRZRA); 18 Steps to the side (KORSTR); To estimate the balance: 19. Standing on two legs, lengthwise, on the bench for balance, with eyes open (S2NUKL); 20. Standing on two legs, transversely, on the bench for balance, with eyes closed (S2NPKL); 21. Standing on one leg, lengthwise, on the bench for balance, with eyes closed (S1NUKL). For the area-specific motor skills 5 variables were applied: 1. The accuracy from the jump shot from 9m (PRSKŠ9M); 2. Ability to throw and catch the balls rejected from the wall (SPBHLOZ); 3. Slalom in the space between 6-9 m (SSL 6-9m); 4. Speed of keeping the ball within the square (BVLUKV); 5. Movement within the triangle with basic defensive attitude (KRUTROS). Within the manifest space comparative statistics was applied: t-test for arithmetic mean between small and large independent samples, while in the latent space correlation analysis (DISKRA) was applied to determine which variables contribute to a statistically significant difference in combinations between two or more groups of respondents.

Results

Table 1. T-test between means of 14 and 15-year-players (G_1 and G_2), general and specific motor

Varijable	Mean G_1	Mean G_2	t-value	df	p
TAPRUK	36,88	32,20	4,22	48	0,00
TAPNOG	21,64	22,16	-0,55	48	0,59
TAPNOZ	22,84	21,68	1,67	48	0,10
PRERAS	55,92	55,20	0,25	48	0,80
DUBPRKL	44,24	46,20	-0,92	48	0,36
ISKPAL	81,12	76,04	1,05	48	0,30
SKUDMJ	2,13	2,02	2,05	48	0,05
SKUVMJ	44,00	38,68	3,04	48	0,00
SPR20M	3,98	3,85	1,20	48	0,24
BARUKL	17,82	18,60	-0,69	48	0,50
BAKOŠL	9,19	9,25	-0,09	48	0,93
BAMEDL	10,30	10,20	0,12	48	0,90
PODT30S	23,80	24,56	-0,70	48	0,49
SKLNTL	19,88	20,72	-0,32	48	0,75
ZGVNVR	5,04	4,52	0,53	48	0,60
OSMSAG	18,87	19,65	-2,27	48	0,03
OKRZRA	4,51	4,93	-1,75	48	0,09
KORSTR	9,88	10,47	-2,84	48	0,01
S2NUKL	5,82	4,94	0,38	48	0,70
S2NPKL	3,79	2,09	4,23	48	0,00
S1NUKL	10,20	2,43	2,56	48	0,01
PRSKŠ9M	5,24	5,24	0,00	48	1,00
SPBHLOZ	20,56	20,48	0,07	48	0,94
SSL 6-9M	12,43	14,94	-7,61	48	0,00
BVLUKV	6,37	6,80	-2,71	48	0,01
KRUTROS	6,99	8,19	-5,94	48	0,00

Mean t-value, df - Degree of freedom, p -Level of significance

To determine the significance of differences between mean values of handball players aged 14 and 15 years, t-test was used for small independent samples, while statistically significant was treated at the level of 0.05 (5%) (Table 1).

According to the results between the treated groups of respondents, a statistically significant difference was found in 10 of the 26 variables applied. Certain differences are identified in the other 15 variables between the two groups that were not statistically significant, while in the variable for accuracy of the jump shot from 9 m (PRSKŠ9M) the same values of arithmetic means for both groups were determined. Respondents from the group of handball players aged 14 years (G_1) achieved significantly better results than the group of handball players aged 15 years (G_2) in a total of 10 variables: hand tapping (TAPRUK), long jump from the spot (SKUDMJ), high jump from the spot (SKUVMJ), eight with bending (OSMSAG), side steps (KORSTR), standing on two legs, transversely, on the bench for balance, with eyes closed (S2NPKL), standing on one leg, lengthwise, on the bench for balance, with eyes closed (S1NUKL), slalom in the space between 6-9 m (SSL 6-9m), speed of keeping the ball within the square (BVLUKV) and movement within the triangle with basic defensive attitude (KRUTROS). Respondents from the group of handball players aged 15 years (G_2) did not achieve statistically significantly better results than the group of handball players aged 14 years (G_1) for any (not one) variable.

For the other variables in which there was no statistically significant difference, handball players aged 14 years (G_1) had better results than the group of handball players aged 15 years (G_2) in the eight variables: foot tapping (TAPNOG), foot tapping on the wall (TAPNOZ), straddle bend (PRERAS), throwing a medicine ball from lying on the back (BAMEDL), pull-ups from the high on the shaft (ZGVNVR), agility in the air (OKRZRA), standing on two legs, lengthwise, on the bench for balance, with eyes open (S2NUKL) and ability of throwing and catching balls rejected from the wall (SPBHLOZ). Respondents from the group handball players aged 15 years (G_2) had better results than the group handball players aged 14 years (G_1) for 7 variables: deep forward bend on the bench (DUBPRKL), bat contortion (ISKPAL), running 20 m - high start (SPR20M), throwing the handball ball from the straddle sitting position from the ground (BARUKL), throwing basketball ball from the chest from sitting on a chair (BAKOŠL), lifting torso in 30 sec (PODT30S) and pushups on the floor (SKLNTL). To determine the significance of differences between means of the non-athletes aged 14 and 15 years, t-test was used for big independent samples, while statistically significant difference was treated at the level of 0.05 (5%) (Table 2). According to the obtained results (Table 2) between the treated groups of respondents, a statistically significant difference was found in 7 of the 26 variables applied. Certain differences are identified in the other 19 variables between the two groups that were not statistically significant. Respondents from the group of 14 years old non-athletes (G_3) achieved significantly better results than the group of 15 years old non-athletes (G_4) for slalom in the space between 6-9 m (SSL 6-9m) variable.

Table 2. T-test between means of 14 & 15-year non-athletes (G_3 & G_4) general and specific motor skills

Varijable	Mean G_3	Mean G_4	t-value	df	p
TAPRUK	32,09	31,24	1,62	198	0,11
TAPNOG	20,88	21,49	-1,35	198	0,18
TAPNOZ	20,91	21,01	-0,24	198	0,81
PRERAS	46,93	45,15	1,29	198	0,20
DUBPRKL	41,29	40,29	0,95	198	0,34
ISKPAL	71,21	74,81	-1,69	198	0,09
SKUDMJ	1,96	1,99	-1,01	198	0,32
SKUVMJ	33,13	35,87	-2,98	198	0,00
SPR20M	3,86	3,76	1,97	198	0,05
BARUKL	12,60	12,76	-0,34	198	0,73
BAKOŠL	8,57	8,44	0,66	198	0,51
BAMEDL	8,91	8,78	0,51	198	0,61
PODT30S	23,94	23,80	0,22	198	0,83
SKLNTL	17,17	15,84	1,01	198	0,31
ZGVNVR	3,53	2,61	1,91	198	0,06
OSMSAG	19,60	19,00	1,49	198	0,14
OKRZRA	5,17	5,23	-0,46	198	0,64
KORSTR	10,45	10,77	-1,47	198	0,14
S2NUKL	3,64	5,01	-1,48	198	0,14
S2NPKL	2,67	3,19	-2,06	198	0,04
S1NUKL	2,21	3,73	-3,47	198	0,00
PRSKŠ9M	1,55	1,71	-0,73	198	0,46
SPBHLOZ	18,67	18,41	0,52	198	0,60
SSL 6-9M	14,30	15,00	-3,81	198	0,00
BVLUKV	7,70	7,21	3,10	198	0,00
KRUTROS	8,89	8,22	5,47	198	0,00

Respondents from the group of 15 years old non-athletes (G_4) achieved significantly better results than the group of 14 years old non-athletes (G_3) for 6 variables: high jump from the spot (SKUVMJ), running 20 m - high start (SPR20M), standing on two legs, transversely, on the bench for balance, with eyes closed (S2NPKL), standing on one leg, lengthwise, on the bench for balance, with eyes closed (S1NUKL), speed of keeping the ball within square (BVLUKV), and movement within the triangle with basic defense paragraph (KRUTROS). The other variables in which there was no statistically significant difference, 14 years old non-athletes (G_3) achieved better results than a group of 15 years old non-athletes (G_4) for 12 variables: hand tapping (TAPRUK), straddle bend (PRERAS), deep forward bend on bench (DUBPRKL), bat contortion (ISKPAL), throwing basketball ball from the chest from sitting on a chair (BAKOŠL), throwing a medicine ball from lying on the back (BAMEDL), lifting torso in 30 sec (PODT30S), push-ups on the ground (SKLNTL) pull-ups from the high on the shaft (ZGVNVR), agility in the air (OKRZRA), side steps (KORSTR) and the ability to throw and catch the balls rejected from the wall (SPBHLOZ). Respondents from the group of 15 years old non-athletes (G_4) achieved significantly better results than the group of 14 years old non-athletes (G_3) for 7 variables: foot tapping (TAPNOG), foot tapping on the wall (TAPNOZ), long jump (SKUDMJ), throwing the handball ball from the straddle sitting position from the ground (BARUKL), eight with bending (OSMSAG), standing on two legs, lengthwise, on the bench for balance, with eyes open (S2NUKL) and precision from a jump shot from 9 m (PRSKŠ9M).

Table 3. Discriminant analysis - motor skills, 14 and 15 years, handball players and non-athletes (groups 1, 2, 3 and 4)

Eigenvalue	Canonical R	Wilks' Lambda	Chi-Sqr.	df	p-level
1,03	0,71	0,33	263,21	63	0,00
0,26	0,45	0,67	96,00	40	0,00
0,19	0,40	0,84	42,00	19	0,00

The discriminant analysis examined the differences in motor tests between handball players and non-athletes aged 14 and 15 years. According to Table 3, three significant canonical value (characteristic roots) were isolated between the four treatment groups of handball players and non-athletes at the level of 0.00.

Table 4. Structure of the discriminant function of motor tests, between 14 and 15 years, handball players and non-athletes (groups 1, 2, 3 and 4)

Varijable	Root 1	Root 2	Root 3
TAPRUK	0,37	-0,21	0,41
TAPNOG	0,08	0,09	-0,20
TAPNOZ	0,20	-0,03	0,03
PRERAS	0,35	0,30	0,20
DUBPRKL	0,19	0,31	0,10
ISKPAL	0,17	-0,07	-0,17
SKUDMJ	0,23	-0,09	-0,06
SKUVMJ	0,48	-0,11	-0,28
SPR20M	0,13	0,01	0,33
BARUKL	0,57	0,56	-0,05
BAKOŠL	0,15	0,16	0,08
BAMEDL	0,25	0,20	0,08
PODT30S	0,01	0,10	0,01
SKLNTL	0,14	0,19	0,13
ZGVNVR	0,18	0,15	0,29
OSMSAG	-0,04	0,17	0,18
OKRZRA	-0,21	0,01	-0,14
KORSTR	-0,14	0,02	-0,29
S2NUKL	0,08	-0,05	-0,17
S2NPKL	0,10	-0,46	-0,15
S1NUKL	0,35	-0,44	-0,06

Table 4 shows the three isolated discriminant functions for handball players and non-athletes aged 14 and 15 years. According to the obtained values, pronounced discrimination for the first function is defined in variables: hand tapping (TAPRUK), straddle bend (PRERAS), high jump from the spot (SKUVMJ), throwing the handball ball from the straddle sitting position from the ground (BARUKL) and standing on one leg, lengthwise on the bench for balance, with eyes closed (S1NUKL); pronounced discrimination with other functions is determined in variables: straddle bend straddle (PRERAS), deep forward bend on the bench (DUBPRKL), throwing the handball ball from the straddle sitting position from the ground (BARUKL), standing on two legs, transversely on the bench for balance, with eyes closed (S2NPKL) and standing on one leg, lengthwise on the bench for balance, with eyes closed (S1NUKL); pronounced discrimination at the third function was found in variables: hand tapping (TAPRUK) and running 20 m - high start (SPR20M). Projections of other variables are below the established value (0.30) and we can't conclude if they contribute significantly to the discrimination between groups.

Table 5. Centroids of the groups for motor tests between 14 and 15 years old, handball players and non-athletes (groups 1, 2, 3 and 4)

Group	Root1	Root2	Root3
G_1	2,66	-0,62	0,29
G_2	1,06	1,38	-0,26
G_3	-0,60	0,05	0,47
G_4	-0,33	-0,24	-0,47

From the table 5 which shows the centroids, maximum centroid values in the first function are G_1, G_2, G_4, and least - G_3. The sequence of the second function is: G_2, G_3, G_4 and G_1. For The third function sequence toward achievements is G_3, G_1, G_2 and G_4.

Table 6. Discriminant analysis - specifically-motor tests for 14 and 15 years old, handball players and non-athletes (groups 1, 2, 3 and 4)

Eigen-value	Canonial R	Wilks' Lambda	Chi-Sqr.	df	p-level
1,00	0,71	0,34	265,09	15	0,00
0,28	0,47	0,68	96,10	8	0,00
0,15	0,37	0,87	35,10	3	0,00

The discriminant analysis examined the differences in specific-motor tests between handball players and non-athletes aged 14 and 15 years. According to Table 6 three significant canonical value (characteristic roots) were isolated between the four treatment groups of handball players and non-athletes, at the level of 0.00.

Table 7. Structure of the discriminant function for specific-motor tests, between 14 and 15 years old, handball players and non-athletes (groups 1, 2, 3 and 4)

Varijable	Root 1	Root 2	Root 3
PRSKŠ9M	0,77	-0,11	0,60
SPBHLOZ	0,21	0,04	0,23
SSL 6-9M	-0,36	-0,89	0,10
BVLUKV	-0,39	0,19	0,24
KRUTROS	-0,59	0,10	0,78

Table 7 shows the three statistically significant discriminant functions for men and non-athletes aged 14 and 15 years. According to their values more pronounced discrimination in the first function exists in 4 out of 5 treated variables. A statistically significant discrimination between the treatment groups was observed in variables: the precision of a jump shot from 9 m (PRSKŠ9M), slalom in the space between 6-9 m (SSL 6-9m), speed of keeping the ball within the square (BVLUKV) and movement within the triangle with basic defence attitude (KRUTROS).

More expressed discrimination in the second function is observed in variables - slalom in the space between 6-9m (SSL 6-9m), while pronounced discrimination in third position is seen

in variables: the precision of a jump shot from 9 m (PRSKŠ9M) and movement in the triangle with basic defensive attitude (KRUTROS).

Table 8. Group centroid of specific-motor tests between 14 and 15 years old, handball players and non-athletes of continental regions (groups 1, 2, 3 and 4)

Group	Root1	Root2	Root3
G_1	2,44	0,78	-0,34
G_2	1,31	-0,85	0,84
G_3	-0,69	0,44	0,22
G_4	-0,25	-0,42	-0,35

In Table 8, which shows the centroids, maximum value centroids for the first function are G_1, G_2, G_4, and least - G_3. For the second function, the sequence is: G_1, G_3, G_4 and G_2. The third function has the sequence toward achievements of G_2, G_3, G_1 and G_4.

Discussion and conclusion

Based on the results obtained using the t-test between fourteen and fifteen years old handball players, we come to the conclusion that the fourteen years old handball players achieved better results in a number of variables, but not in all. These results may partly agree with previous research which aimed to establish the existence of differences between different ages of the handball players (Vuleta, Milanovic and Jukic, 1999; Vuleta, Prelcec and Gruic, 2004).

Therefore this can be justified by the fact that children of certain age are developing by different dynamics, ie. speed of the growth of bone system, muscle, organ systems is different from degree to degree, and this development is largely dictated by their physiological and motor skills (Tudor, 2005). Also, the results can be explained by the training process for young handball players (14 ± 6months) where may prevail other factors such as motivation, which is a very important domain of psychological preparation of athletes, all in order to obtain the slots and desire for the corresponding position in his team. Research (Vuleta et al., 1999) found differences between handball cadet and senior players, where the results show that the cadets had in some tests the same or similar results as seniors, and that in one test were even superior compared to seniors.

By analyses of results obtained between handball players and non-athletes, we come to the conclusion that the handball players generally achieved significantly better results than non-athletes. These results are fully consistent with previous research (Delia, Simenc and Vuleta, 1995). The results indicate that the systematic engagement in handball training can improve the general and specific-motor abilities of young athletes.

References

- Bjelica, D., Georgiev, G. & Muratović, A. (2012). Basic motor abilities of young handball players from Montenegro. *Sport Science*, 5(1), 71–76.
- Chelly, M., S., Hermassi, S., Aouadi, R., Khalifa, R., Van den Tillaar, R., Chamari, K., & Shephard, R.J. (2011). Match Analysis Of Elite Adolescent Team Handball Players. *Journal Of Strength And Conditioning Research*, 25(9), 2410–2417.
- Delija, K., Šimenc, Z., & Vuleta, D. (1995). Razlike u nekim opštim i situacijskim testovima motoričkih sposobnosti rukometaša i nerukometaša. *Kineziologija*, 27(1), 57–61.
- Tudor, O.B. (2005). *Cjelokupan trening za mlade pobjednike*. Zagreb: Gopal.
- Milanović, D., Vuleta, D., & Tomašević, S. (2013). Razlike rukometaša kadetske i seniorske dobi u pokazateljima kondicijske pripremljenosti. *Sport Mont*, 34-36(11), 37-39.
- Muratović, A. (2014). Komparativna analiza biomotoričkog statusa rukometaša i nesportista u kadetskom uzrastu Crne Gore. /Doktorska disertacija/. Nikšić: Fakultet za sport i fizičko vaspitanje.
- Vuleta, D., Milanović, D., & Nikolić, A. (2012). Razlike između rukometaša kadeta i mlađih kadeta u pokazateljima specifičnih motoričkih sposobnosti. *Sport Mont*, 34-36(10), 34–37.
- Vuleta, D., Prelčec, D., & Gruić, I. (2004). Usporedba dvije skupine rukometaša različite kvalitete u pokazateljima kondicijske pripremljenosti. U *Zborniku radova 13. Ljetne škole kineziologa Republike Hrvatske*, Rovinj (pp. 206–211). Zagreb: Hrvatski savez kineziologa.
- Vuleta, D., Milanović, D., & Jukić, I. (1999). Dijagnostika motoričkih sposobnosti kao kriterij za selekciju vrhunskih rukometaša. „*Kineziologija za 21 stoljeće*“, zbornik radova 2. međunarodne znanstvene konferencije (pp. 310–312).

KOMPARATIVNA ANALIZA MOTORIČKIH I SPECIFIČNO MOTORIČKIH SPOSOBNOSTI IZMEĐU RUKOMETAŠA I NESPORTAŠA U KADETSKOM UZRASTU CRNE GORE

Sažetak

Istraživanje je provedeno s ciljem utvrđivanja razlika u motoričkom i specifično-motoričkom prostoru crnogorske omladine kadetskog uzrasta (14 ± 6 mjeseci; 15 ± 6 mjeseci). U ovom istraživanju obuhvaćen je uzorak od ukupno 120 ispitanika, od kojih je 60 dječaka koji nisu organizirano uključeni u trenažni proces i 60 rukometaša koji su organizirano uključeni u rukometni trening. Motorički prostor je tretiran sa dvadeset jednom (21) varijablom koje hipotetski pokrivaju područje: segmentarne brzine, fleksibilnosti, eksplozivne snage nogu, eksplozivne snage ruku i ramenog pojasa, repetitivne snage, koordinacije i ravnoteže. U prostoru specifično-motoričkih sposobnosti primijenjeno je pet (5) varijabli koje hipotetski pokrivaju područje: preciznost šutiranja, sposobnost baratanja s loptom, brzina trčanja u slalomu, brzina vođenja lopte i brzina kretanja bez lopte. Na temelju dobivenih rezultata utvrđivanja razlika t-testom i diskriminativnom analizom zaključujemo da su rukometaši generalno s boljim motoričkim i specifično-motoričkim sposobnostima od učenika koji nisu aktivno uključeni u bilo koji oblik fizičke aktivnosti osim redovite nastave tjelesnog vježbanja. Također, dobiveni rezultati ukazuju da su četrnaestogodišnji rukometaši postigli bolje rezultate u većem broju varijabli u odnosu na rukometaše uzrasta petnaest godina.

Ključne riječi: motorika, specifično-motoričke sposobnosti, sportaši, učenici, kadeti, t-test, diskriminacija

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